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Editorial

The OPUS Journal of Society Research (OPUS JSR) brings together a diverse range of theory, practice, and research in the pursuit of understanding human behavior in its social context. The interdisciplinary viewpoint lays the groundwork for presenting and establishing a holistic relationship with other disciplines, concepts, and methods. The OPUS JSR allows researchers to use an interdisciplinary approach to present different interpretations and alternative points of view. The theoretical frameworks that underpin the analyses and interpretations of the subjects under study are as important as the intersection of disciplines. This framing can lead to greater clarity of multiple, even contradictory findings, allowing for a better understanding of social dynamics that would otherwise be invisible if scholars concentrated on a single set of theoretical dynamics.

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RESEARCH ARTICLE

Digitalization of Grief: Analyzing Emotions of Loss and Grief through YouTube Comments

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Abstract

Today, the internet and social networks play an important role in socializing and interacting with society. YouTube ranks first among digital Social Networking Sites (SNS) in this direction. For this reason, YouTube emerges as a new public space for comments on loss and grief. However, despite this, there appears to be no study analyzing these comments in the context of loss and grief. In this direction, this research aims to analyze the emotions of user comments under three songs uploaded to YouTube video site, one of the social media platforms, and selected in accordance with the research purpose. In the research, user comments written under YouTube music videos were analyzed with a qualitative approach in the context of grief emotions. For this purpose, document analysis was used as a data collection tool in the study, and the collected data were examined using content analysis techniques. The results of the study showed that codes such as longing, sadness, anger, guilt, denial, inability to accept, grief, empathy and loneliness emerged. It also shows that users use YouTube as a tool to convey their experiences and emotions during the mourning process. It seems that the increasing use of social media networks and the use of these channels by individuals to convey their feelings of grief may change social norms of mourning in the near future.

Keywords: Digital mourning, mourning on social media, mourning on YouTube, mourning comments, online grief reactions

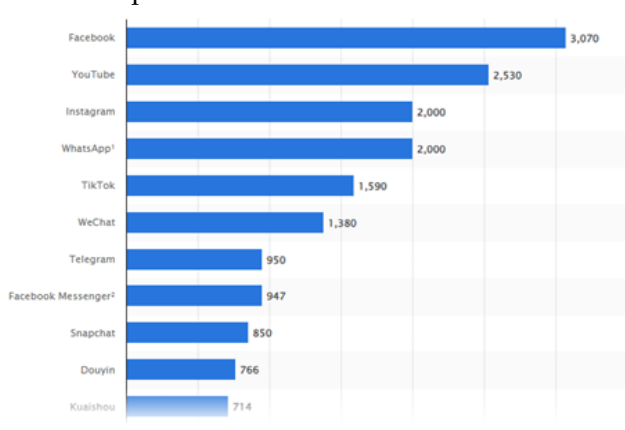
Öz

Günümüzde internet ve sosyal ağlar toplumun sosyalleşmesinde ve etkileşime geçmesinde önemli bir rol oynamaktadır. Bu yöndeki dijital Sosyal Ağ Siteleri (SNS) arasında YouTube ilk sıralarda yer almaktadır. Bu nedenle YouTube, kayıp ve yas yorumlarının yapıldığı yas için yeni bir kamusal alan olarak karşımıza çıkmaktadır. Ancak buna rağmen kayıp ve yas bağlamında bu yorumları analiz eden bir çalışmanın olmadığı görülmektedir. Bu doğrultuda bu araştırma sosyal medya platformlarından biri olan YouTube video sitesine yüklenen ve araştırma amacına uygun olarak seçilen üç şarkının altına yapılan kullanıcı yorumlarının duygu analizini yapmayı amaçlamaktadır. Araştırmada YouTube müzik videoları altına yazılan kullanıcı yorumları yas duyguları bağlamında nitel bir yaklaşımla analiz edilmiştir. Bu amaçla araştırmada veri toplama aracı olarak döküman analizi kullanılmış, toplanan veriler ise içerik analizi teknikleri ile irdelenmiştir. Araştırma sonuçları özlem, üzüntü, öfke, suçluluk, inkar, kabullene-meme, keder, empati ve yalnızlık gibi kodların ortaya çıktığını göstermiştir. Ayrıca kullanıcıların yas sürecinde YouTube deneyim ve duygularını aktarmak için bir araç olarak kullandıklarını göstermektedir. Sosyal medya ağlarının giderek artan kullanımı ve bireylerin yas duygularını aktarmak için bu mecraları kullanmaları yakın bir gelecekte toplumsal yas tutma normlarını değiştirebilecek gibi görünmektedir.

Anahtar Kelimeler: Dijital yas, sosyal medyada yas, YouTube'de yas, yas yorumları, online yas tepkileri.

Introduction

Today, the development of information technologies and the widespread use of the internet has brought digital platforms to take a serious place in people's lives (Şahinaslan et al., 2022). This situation is clearly reflected in statistical data. Worldwide, as of February 2025, Saudi Arabia has the highest YouTube access with 95.8%, Israel ranks second with 93.3%, followed by Singapore with 91.8%. Turkey has an access rate of 76.3% (Statista, 2025). In Turkey, the rate of households with internet access is 95.5% (TÜİK, 2023) and the rate of individuals using the internet is 88.8%. The social media platforms that people use the most are WhatsApp with 86.2%, YouTube with 71.3% and Instagram with 65.4% (TÜİK, 2024). Digital media users are active by making choices in line with their own preferences and tendencies.



Source: (Statista, 2025).

Figure 1. Social Media Usage Rates

As Figure 1 shows, Facebook is the first social network to surpass one billion registered accounts and now has more than three billion monthly active users. It is immediately followed by YouTube with 2.5 billion active users (Statista, 2025).

YouTube is a platform that enables user interaction based on content as a video sharing site. Users comment on video content and experiences. Thanks to the comment feature on the platform, people can provide feedback and share their thoughts, criticisms, and experiences. Therefore, it also has a storage and archiving quality as a digital environment (Akyıldız, 2023). Additionally, social media environments are recognized as spaces

where interaction, communication, identity representations, and self-presentation take place (Göker & Keskin, 2016). YouTube, which has become more widely used as a social space in recent years, enables individuals, groups, and communities to interact more through the opportunities it offers its users to share videos, create content, and make comments (Balakrishnan & Griffiths, 2017). For this reason, YouTube comments are used in many studies (Ergan & Ergan, 2021; Balakrishnan & Griffiths, 2017; Karakoyunlu, 2023; Akyıldız, 2023; Şahinaslan et al., 2022). Music's ability to convey difficult emotions, its function in enabling individuals to exist in social contexts, its evaluation as a reflection of emotional sensitivities and mood, and its role in conveying both emotions and meanings demonstrate the multidimensional effects of music (Mattfeldt, 2024). In addition, music facilitates the process of evoking emotions and assimilating the information conveyed (Pentaris & Yerosimou, 2014). These functions of music suggest that it may facilitate the reflection of emotions such as grief, pain, longing, sadness, and loneliness.

Digital environments are emerging as new spaces where grief is experienced (Brubaker et al., 2013). The idea that social networking sites can draw death and mourning out of both private and public spaces and into social media platforms reinforces this situation (Walter et al., 2012). This is because users can make numerous comments after accessing videos through these social networks (Lange, 2007). Therefore, users share their feelings, thoughts, and emotions on video-sharing sites such as YouTube (Asghar et al., 2015). As the years go by, social media is becoming more of a means of communication, and users frequently share their feelings and thoughts on YouTube. The amount of comments posted there shows that this data can be analyzed (Cunha et al., 2019).

Throughout their lives, people lose possessions, various assets, and loved ones/close relatives (Kübler-Ross & Kessler, 2000, p. 108). As a response to loss and its most prominent feature, they mourn (Volkan & Zintl, 2020). As a result, certain emotional, behavioral, physical, and social changes occur during the grieving process. Individuals who are grieving may experience reactions

such as sadness, grief, pain, crying, social withdrawal, sleep disturbances, loss of appetite, and difficulty breathing (Hablemitoğlu, 2021). To better understand and comprehend the reactions experienced during the grief journey, Elizabeth Kübler-Ross divided the grief journey into stages she classified as denial, anger, bargaining, sadness, and acceptance (Kübler-Ross & Kessler, 2004). During the grieving process, which is a phenomenon characterized by significant psycho-social changes (Parkes, 1988, p. 366) and the peak of human sorrow (Roubenzadeh et al., 2012, p. 2132), individuals seek to share and communicate their feelings and experiences (Yelboğa, 2024). The need of individuals in mourning and the emotional content of social media platforms, along with users' interactions with these environments, have given them the quality of a new space. The ability to actively listen to and watch content and comment on these videos is considered a new way of expressing emotions and sharing feelings/thoughts. In this sense, Rode-Breymann (2020) emphasizes the active role of music on emotions, noting that listening to music also reflects physical responses (crying, etc.).

There are studies that address the transition of grief to digital forms as a public space. A multidimensional study examining how digital platforms mediate the emotional, sensory, and philosophical dimensions of grief through social media content analysis has been explored through participants' narratives. The study highlights that virtual platforms encourage grief experiences (Sheikh, 2025). Another study addressing the role of digital identities on Facebook in the post-death process emphasizes that online applications should be considered as new environments where public mourning takes place (Brubaker et al., 2013). A study examining how young internet users utilize social media platforms as a means of connection with deceased individuals revealed that social media empowers those left behind (Carroll & Landry, 2010). A study focusing on the role of music in regulating emotions has revealed that music is a powerful tool in regulating and exploring grief emotions (Davidson & Garrido, 2016). A study examining how death is represented on Instagram and how shared posts transform social media into mourning spaces has

noted that most shared images reflect individuals' emotional states and contexts (Gibbs et al., 2015). A qualitative study examining YouTube mourning vlogs has revealed that young people create vlogs about their grief within the first few hours after the death of their parents, and that YouTube has become the primary social space for mourning (Gibson, 2015). Thus, international studies in the literature clearly show that social media platforms are used as public mourning spaces and that feelings of grief are processed in these spaces. In the national literature, YouTube comments on other topics have been examined in many studies (Karakoyunlu, 2023; Şahinaslan et al., 2022; Kaygısız, 2023; Söğüt, (2021)), but no studies on loss and grief have been found. For example, there are studies that measure users' happiness levels on social media (Balci & Demir, 2018; Uygur & Dilmaç, 2021); studies that examine emotional contagion on social media during the COVID-19 pandemic (anger, sadness, fear, etc.); and studies that focus on emotional exhaustion on social media. However, there appears to be no study in the national literature that directly addresses loss and grief on social media platforms. Additionally, the topic of loss and grief is an under-researched area in Turkey. This clearly demonstrates that the current study contributes to the literature with its original aspects.

This study examined YouTube music video comments as a means of sharing grief in the context of Turkey. The lack of studies on grief in social media in Turkey makes this study unique in that it reveals emotions such as shock, denial, sadness, pain, grief, longing, guilt, helplessness, and feelings of emptiness. On the other hand, the results of this research clearly show that social media platforms have become public spaces where grief is processed and maintained in the digital age. Furthermore, it has been observed that individuals share their feelings on these platforms immediately after a loss, revisit these spaces after a certain period of time to read the comments on the same music videos, and feel the need to comment again with expressions that represent their unending feelings of grief. Moreover, the music videos that are listened to and watched trigger grief emotions and facilitate their processing. In addition, it has been understood that individuals make comments

in roles such as seeking support, empowering, and empathizing. This clearly shows that YouTube has taken on the function of revealing the traditionally suppressed aspects of grief for those who have lost a loved one. The tendency of individuals who have experienced loss to convey and process their feelings of grief on social media platforms appears to have the power to change grief norms and create new communities. Thus, the research not only replicates the phenomenon of grief on social media but also offers a unique contribution to the digital grief experience mediated by music. Therefore, these results demonstrate that the research presents distinctive differences compared to previous studies. When the study's findings are evaluated according to the Kübler-Ross model, it is observed that denial involves shock and detachment from reality; anger involves rage and rebellion; bargaining involves helplessness and guilt; depression involves pain, longing, and loneliness; and acceptance involves feelings of acceptance and longing (Kübler-Ross & Kessler, 2004).

In this direction, this study aims to analyze users' emotions and grief reactions through the questions, "What are individuals' emotions and thoughts regarding their experiences of loss and grief and their grief reactions, and how do they reflect these on the YouTube platform as a digital environment?" and "How do people create meaning related to loss and grief in digital memory?" To this end, the YouTube comments on the selected songs were categorized to understand the emotional responses of individuals in mourning. Despite the increasing use of digital environments in Turkey, there appears to be no academic publication analyzing loss and mourning on social media. Therefore, the current research aims to fill this gap by analyzing the YouTube comments of the songs examined in the study through individuals' digital self-expression, grief responses, and emotions. In this respect, the current research is important in showing how digital environments are used in relation to death and how they can become places of mourning.

Theoretical background

Emotions are closely linked to the psychological structure of human beings and can influence their thoughts, behaviors, and psychological well-being. For this reason, emotional experiences are clinically critical. In order to understand emotions, evaluate them, and unravel their complex connections with health, they must be assessed within a theoretical framework. In this regard, emotional approaches that address and analyze emotions from different perspectives have been developed. For example, emotion regulation was developed to explain the strategies individuals use to effectively manage their emotions and experiences (Gross, 1998). Similarly, theories such as the Five-Stage Grief Process Model, Attachment Theory, Grief Tasks Model, Process Approach, Dual Process Model, Two-Dimensional Grief Theory, and Meaning Reconstruction Model have been developed to explain the process of loss and grief (Yelboğa, 2024). This research is based on Kübler-Ross's (1973) Five-Stage Grief Process Model because it explains the emotions involved in the grieving process in greater detail. It is well known that deep feelings of grief underlie the grieving process and that these feelings shape people's lives in many ways. In a world where no one dies, a person experiencing the emotional pain of loss feels as if they are surrounded by a veil. This situation weakens the person's connection to life and leaves grieving individuals vulnerable to danger (Køster, 2022). In this regard, analyzing grief emotions and establishing a theoretical framework is of critical importance. According to Kübler-Ross's theory, people go through stages of denial, anger, bargaining, depression, and acceptance as they grieve. However, these stages do not follow the same order in every individual; a completed stage may be repeated, or a person may become stuck in the same stage with their feelings and symptoms of grief. The primary focus of this theory is on explaining the symptoms of grief (Kübler-Ross and Kessler, 2004). This theory categorizes the grief responses of individuals experiencing loss and frequently emphasizes the feelings of grief experienced during this process. Some of the comments analyzed in the study are directly related to the denial-shock

stages of the model, and the relevant comments are coded as “shock” and “denial and inability to accept.” Guilt is also considered one of the grief responses with both cognitive and emotional components (Kubany & Manke, 1995), and guilt is often one of the emotions associated with anger. This is related to the theory's anger stage and the responses experienced during this process. On the other hand, the theory emphasizes the experience and processing of pain and grief in all stages it describes (Kübler-Ross & Kessler, 2004). For this reason, the code “sadness, grief, and pain” was created when analyzing video music comments. One of the emotions in this process, longing (Breen and O'Connor, 2007), represents one of the most important emotions of the mourning process (Maciejewski et al., 2007). In this regard, the emotions of mourning expressed in the comments under YouTube music videos were coded according to the Kübler-Ross model. In summary, the processing of emotions such as shock and detachment from reality in the denial stage; anger and rebellion in the anger stage; helplessness and guilt in the bargaining stage; pain, longing, and loneliness in the depression stage; and acceptance and longing in the acceptance stage (Kübler-Ross & Kessler, 2004) has reinforced this idea. In addition to the reactions experienced by individuals during the grieving process, such as sadness, grief, pain, and crying, changes in social relationships also had an impact on the categorization process (Hablemitoğlu, 2021). Furthermore, the fact that the researcher's academic work was related to loss and grief and that he had received various training in this field facilitated the coding process. Therefore, the codes of the study were developed based on the theoretical perspective of this model.

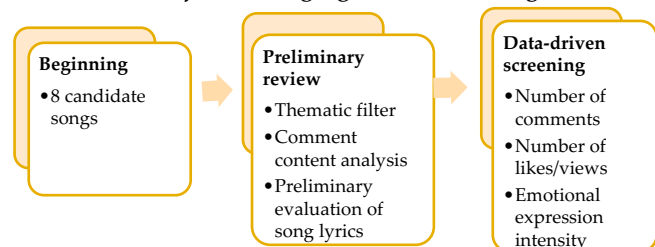
Methodology

This study aims to analyze user comments posted under YouTube music videos in the context of emotions using a qualitative approach. To this end, document analysis and content analysis techniques were used in the study. Document analysis provides researchers with advantages such as time management, usability, easy accessibility, and re-usability (Kiral, 2020). In content analysis, a code

pool appropriate to the research objectives is created, and these codes are then divided into categories and themes (Ültay et al., 2021). In this way, the phenomenon under investigation becomes ready for interpretation by researchers (Olgun, 2008). Additionally, criterion sampling technique, one of the purposeful sampling methods, was used in the study. In this technique, individuals, objects, events, and situations related to the defined problem are expected to possess certain characteristics (Büyüköztürk et al., 2008).

In order to analyze and categorize feelings of grief arising in digital environments, eight songs with content related to death, loss, and illness were first identified. Then, comments posted under these videos were examined for preliminary evaluation and review, and three songs with higher potential to represent the purpose of the study were selected. The flow chart for the song selection process is presented in Table 1.

Table 1. Scheme for reducing eight candidate songs to three



As shown in Table 1 the inclusion criteria for selecting music tracks were determined as follows: a) if the music track is related to death and grief and evokes these emotions; b) if comments related to death and grief were made under the selected music track; c) if the viewed and commented statistics of the evaluated songs are high, it was decided that the music track is suitable for the purpose of the research. A criterion of having received at least 1,000 comments per music piece was also established.

During the research process, comments made on the videos were first collected and uploaded to the MAXQDA program. The comments were then coded independently and subsequently combined or separated into different codes as necessary. After the codes were determined, expert opinions

were obtained from two researchers. This approach was used to ensure the reliability of the research. Additionally, Kübler-Ross's (1973) five-stage model of emotional and mental grief responses (Keser, 2019) shed light on the identification of preliminary codes and facilitated the process. The table below shares information about the music videos whose comments were analyzed.

Table 2. Information about songs analyzed in the study

Song name	Total number of comments	Number of comments reviewed in the video	Number of likes	Number of views
1) Ruhumda Sızı (Ender Balkır-29.05.2025)	25.888	2000	612.000	154 million
2) Cerrahpaşa (Volkan Konak-01.06.2025).	1.865	1.865	76.000	22 million
3) Yalan (Candan Erçetin-02.06.2025).	14.568	2000	362.000	103 million

Note: The songs in the table are not ranked according to any particular criterion. They are numbered according to the order in which the song reviews were analyzed.

Considering both the appeal to feelings of loss and grief and the fact that the comments written under the music video are related to the concept of loss and grief, it was decided that the songs listed in Table 1 were appropriate. The comments on the selected songs were coded and visualized using the MAXQDA 2020 package. Following the emotional analysis of music videos related to loss and grief in line with the research objective, the codes identified by the research were presented and interpreted in detail in the findings section.

Findings

In the study, music videos were first identified, user comments were analyzed using content analysis methods, and codes were created. As mentioned in the theoretical background section of this study, Kübler-Ross's Five Stages of Grief Model was used to determine the research codes. Additionally, sources addressing the grief process (Hablemitoğlu, 2021; Volkan & Zintl, 2020; Yelboğa, 2024) were reviewed, and the grief reactions and emotions described in these sources were taken into consideration. Additionally, emotions

defined in scales used to classify emotions in sociology and psychology (Prigerson et al., 1995; Watson et al., 1988; Lev et al., 1993) were examined, music video comments were analyzed, and corresponding codings were made. Codes such as sadness, anger, guilt, denial, inability to accept, grief, empathy, and loneliness were created, and quotations representing emotions were made. The patterns that emerged from the transfer of comments were found to generally include content such as determining grief reactions (emotional and cognitive) and classifying grief emotions. In the final analysis, 17 codes were identified. The codes identified are presented in Figure 2.

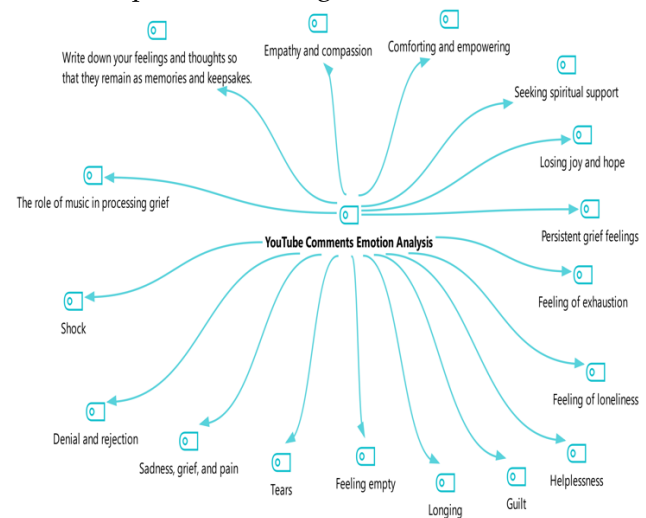


Figure 2. MAXMaps Graph

Music videos serve as a medium for representing and conveying emotions. Individuals try to experience and discover their emotions by playing music videos that reflect their feelings. "If, like me, you play this song in the middle of the night and listen to it, brother, surely there are things you have lost too" (Song 1). These lyrics clearly demonstrate the potential of music videos. Similarly, the line "The listener has already lost everything..." clearly demonstrates the potential of music to represent emotions. The codes and coded sections that emerged from the analysis are interpreted and presented below in order. The table below shows sample participant comments for each code.

Table 3. Summary table of participants' representative comments on music videos

Code	Sample participant opinion
<i>The role of music in processing grief</i>	"When people lose their loved ones, they find themselves here..." (Song 3). "I lost my father three days ago. This song opened my heart. Now it has become a pain in my soul." (Song 1).
<i>Denial and rejection</i>	"When I heard that she had died, my life was over. I got cancer, I wasted away day by day, I still can't bear the longing, the yearning, the absence, I can't accept it..." (Song 3)
<i>Sadness, grief, and pain</i>	"Now I've grown up, I listen to it for my mother. At 44, I buried my dear mother in the ground... My heart can't bear it." (Song 2).
<i>Tears (crying)</i>	"42 years without a father, 32 years without a mother, 35 years without sibling love. The pain in my soul never ended. Every time I am alone, my tears flow like a river." (Song 1).
<i>Feeling empty</i>	"As the law fills up, one realizes that life is meaningless and empty..." (Song 3).
<i>Longing</i>	"October 1, 2024, 3:55 p.m. My princess, I miss you so much already that I didn't realize how much you meant to me. I miss your voice so much that I would give anything to hear it just once more." (Song 3)
<i>Guilt</i>	"I couldn't repay her for everything she did for me. I couldn't be by her side when she took her last breath, even though I loved her so much. I couldn't do anything for my mother. She always made all the sacrifices." (Song 3).
<i>Feeling of loneliness</i>	"I lost my father five years ago, my sister five months ago, and my mother passed away on September 9, 2021, at 1:47 a.m. My dear mother has passed away. I am alone in this life. 🥺" (Song 3).
<i>Feeling of exhaustion</i>	"I want to live, but I don't have the strength..." (Song 1).
<i>Persistent grief feelings</i>	"You don't say goodbye to a mother; her grave will be buried in my heart for a lifetime, I suppose." (Song 2).
<i>Losing joy and hope</i>	"My dear friend, whenever I listen to you, I remember you. My world was wet with the rain of your tears and it has not dried up. You were so young, you were our joy. You took our joy with you, you shot us both in the heart and in the head. You left us doomed to live with a wound inside us." (Song 1).
<i>Seeking spiritual support</i>	"You can't talk to anyone about your problems, you're stuck in a bubble, you go back and forth between life and death, and this translates to my soul..." (Song 1).
<i>Comforting and empowering</i>	"Love your troubles, they are a gift from Allah. Be patient, the one who tests you with troubles will surely reward you with a smile one day. May God heal all those who have troubles and cure those who are sick." (Song 1).
<i>Empathy and compassion</i>	"No one writes their troubles without knowing each other, and some don't have the strength to write and just read what is written. 🥺" (Song 1).
<i>Write down your feelings and thoughts so that they remain as memories and keepsakes.</i>	"I'm 15 years old, my parents are dead ... today is my birthday, no one celebrated it, like it and keep it as a memory 🥰💔💔💔💔💔" (Song 1).

The sample participant opinions summarized in Table 3 have been presented and interpreted with each code as a subheading.

The role of music in processing grief

Music is seen as an important tool for processing and rediscovering feelings of grief (Davidson & Garrido 2016). Indeed, this function is clearly evident in the comments on the music videos included in the analysis of this study.

"People will listen to the music, read the comments, and shed tears. All three at once, so to speak 🥺🥺" (Song 1).

"When people lose their loved ones, they find themselves here..." (Song 3).

"The most painful separation is death. Last year, I lost my father. I never listened to this kind of music before, but now I listen to nothing else. Everyone has a debt to pay, but death is very difficult." (Song 2).

"This is the stop for those who have lost; winners rarely come here..." (Song 1).

Shock

People experience shock when they encounter unexpected situations, especially when they receive bad news such as death. Shock is one of the first and most important stages of the grieving process (Kübler-Ross & Kessler, 2004). Individuals may even find it difficult to believe that what they are experiencing is real due to the impact of the shock they are experiencing (Keser, 2021).

"Yesterday, I lost my friend of five years in a traffic accident. I am so shocked that I am still waiting for him to return. The depth of the song is now clearer. The pain is in my soul, not my body, and no one knows. May your place be in heaven, my brother" (Song 1).

"Just as I was halfway through school, my mother suddenly fell ill. I left school to be by her side, and my dear mother passed away in my arms. We couldn't save her... I don't understand what happened, I don't know what I'm going through, and I still can't get over the shock..." (Song 1).

Denial and rejection

Denial and refusal to accept are also explained in Kübler-Ross's five-stage model of grief. In one of her studies, she emphasized that denial is a way for people to escape the inevitable pain of death. According to her, denial is an early response to grief and pain (Kübler-Ross, (2014). Denial is a stage in which individuals can resist all stages of grief, and grief is not expected to subside until acceptance occurs in those left behind (Yelboğa, 2024). Those who have experienced loss cannot believe that what they are going through is real. The participants' statements describing their denial and inability to accept are as follows.

"I still can't believe my mother died, I don't want to believe it, I don't want to accept it." (Song 1).

"All my loved ones are dying. Why am I still alive, damn it?" (Song 2).

"When I heard that she had died, my life was over. I got cancer, I wasted away day by day, I still can't bear the longing, the yearning, the absence, I can't accept it..." (Song 3)

Sadness, grief, and pain

Comments posted under YouTube videos have been found to express emotions such as sadness, pain, and grief. According to the results of a study, the emotions conveyed in the comments were predominantly grief/pain, sadness, and tears (Pentaris & Yerosimou, 2014).

"When pain reaches its peak, tears do not flow from the eyes." Now I understand why I didn't cry... (Song 1).

"There is no farewell to mother, her grave will be buried in my heart for a lifetime, I suppose." (Song 2).

"I listen to it every day since the February 6 earthquake; I even lull my baby to sleep with this song. I feel the pain of losing my loved ones every day with this song, not in my body but in my soul, ooh ooh 🥹" (Song 1).

"This is a pain I've never felt before, one I can't describe... They must have ripped my heart out... A piece of my soul is gone..." (Song 1).

"Now I've grown up, I listen to it for my mother. At 44, I buried my dear mother in the ground... My heart can't bear it." (Song 2).

Tears (crying)

In addition, the study found that there were many references to tears and crying. A study also indicated that the comments made represented crying and tears (Pentaris & Yerosimou, 2014). The statements in this regard are as follows.

"The pain in my soul never ended. Every time I am alone, my tears flow like a river." (Song 1).

"It's very sad, I cry every time I listen to it because I also lost my father early." (Song 2).

"No one should take offense, but I'm going to be selfish. I don't know if the pain inside me is the greatest, but at this moment, it's very great. It makes it hard to breathe, and every hour, it makes a 28-year-old cry uncontrollably." (Song 1).

"Is there anyone who cries uncontrollably and listens to it over and over again, so that the pain has literally seeped into my internal organs..." (Song 1).

"Friends, when I was 9 years old, I lost my brother 🥹🥹🥹🥹 then I locked myself in a room and cried as much as I could, then I couldn't sleep for three nights..." (Song 1).

A study has also revealed that people who watch videos cry and want others to know about their reactions by writing comments (Gibson, 2015). It can be said that people in the current study also wrote about their feelings for this purpose.

Feeling empty

When people lose someone they love or someone close to them, they also experience a loss of meaning. This feeling of meaninglessness can turn into an indescribable void in their lives.

"Every time I listen to this song, I am reminded of the pain in my soul, that subtle pain that never goes away, that never leaves, that takes my breath away... I don't know how a person can get used to it, how they can fill that indescribable void." (Song 1).

"As the law fills up, one realizes that life is meaningless and empty..." (Song 3).

"Feeling helpless, alone, powerless... even though your family, spouse, and children are around you, no one understands your pain. I listen to it while working from 4 a.m. to 10 p.m." (Song 1).

The literature indicates that feeling empty after loss is an important component of grief and complicates the grieving process and adjustment to life (Yelboğa, 2023). As can be understood from the comments, individuals experience feelings of meaninglessness and emptiness.

Longing

Longing is one of the emotions frequently expressed by those left behind among the symptoms of loss (Stroebe, et al., 2010). Grief emotions can sometimes overlap and be experienced together. Emotions such as longing and crying, longing and guilt, and longing and pain can affect people in different ways. Intertwined emotions can also be seen in the participants' comments.

"Today is my father's birthday, it's been 22 days since he passed away. Every night at this time, I cry... I couldn't tell anyone but God... I miss him so much, my friends..." (Song 1)

"October 1, 2024, 3:55 p.m. My princess, I miss you so much already that I didn't realize how much you meant to me. I miss your voice so much that I would give anything to hear it just once more." (Song 3)

"It's been seven days since I lost my father, and I already miss him so much... Appreciate your father's worth; it's hard to be without a commander in war... May God be with and help all my friends who came here after losing their fathers, mothers, and loved ones." (Song 1)

"I came from my mother's grave today. Her words are tearing my heart apart. It's been 16 years since she died, and the pain was like every bone in my body breaking at once. And today is a holiday, missing her, missing her scent, unable to breathe it in..." (Song 1).

During the grieving process, individuals sometimes experience mental and emotional grief reactions without even realizing it. These emotions are grief reactions that need to be experienced and processed, and when they are not, individuals may experience more pathological effects.

Guilt

Guilt is one of the grief reactions that has both cognitive and emotional components (Kubany & Manke, 1995). Individuals may experience guilt

more intensely when they feel they have failed to fulfill their responsibilities toward their deceased loved ones, failed to show them the necessary attention, or were unable to be with them in their final moments. When feelings of guilt are experienced and spread over a long period of time, grief reactions can be even more difficult for the grieving individual. The statements of the participants who commented on this situation clearly demonstrate this.

"My father died yesterday evening in Turkey, and I'm in France and couldn't even go to his funeral 😞" (Song 1)

"I couldn't repay her for everything she did for me. I couldn't be by her side when she took her last breath, even though I loved her so much. I couldn't do anything for my mother. She always made all the sacrifices." (Song 3).

The fact that such comments are posted under music videos clearly shows that feelings of guilt have a serious impact on individuals. For this reason, guilt is addressed in therapy to help individuals forgive themselves (Worden, 2018).

Helplessness

Losses also cause a loss of balance in the individuals left behind (Yelboğa, 2024). Individuals who cannot find a way to cope with their grief in particular find themselves feeling helpless. In such situations, the feeling of "What am I going to do now?" can prevail.

"If I were to gather all the pain I've endured up to this point, it wouldn't even amount to a quarter of this pain... There is no description for it, no cure." (Song 1).

"Alone and helpless in the middle of the world. I'm in the middle of my emotions—if I cry, it doesn't help; if I don't cry, it doesn't work either... I can't take a step forward to reunite with my mother, nor can I take a step back to change what has happened." (Song 3).

Intense feelings of helplessness are one of the criteria for prolonged grief disorder (Prigerson et al., 2021) and can also trigger suicidal thoughts in individuals. Participants' comments in this regard are as follows.

"The saying 'those who take their own lives cannot enter heaven' stops me... May Allah not leave anyone so helpless that they find peace in bed 😞"

"Death is calling me. Should I go? I don't know!"
(Song 1).

Feeling of loneliness

Loneliness is a negative and subjective experience that can be seen in every stage of human life and is felt more strongly when the need for closeness is not met (Akgül, 2016). It is often experienced in situations of loss, especially after the death of individuals who had a strong bond with the person and who held an important place in their life. Descriptions of the feeling of loneliness, accompanied by helplessness, abandonment, longing, and pain, are as follows.

"Do you know what's difficult? You scream and scream, but no one hears you..." (Song 1).

"The most painful thing is to be alone and abandoned in a crowd 🥺" (Song 3).

"I listen to it at least once every night. The year this song came out, the person I loved most in the world was undergoing cancer treatment at Cerrahpaşa Hospital. We lost him, and years have passed, but we have never forgotten him. If you have lost your loved ones in life, you are now alone, just like us who are left behind, paying the price for it." (Song 2).

"Sometimes you can't breathe... I'm tired of living. Of not being able to live for myself... Today is my birthday. Returning home alone without blowing out the candles on a cake, tears streaming down my face as I listen to this song... A ache in my soul... Voices in my head... I miss my mother so much." (Song 1).

"I lost my father five years ago, my sister five months ago, and my mother passed away on September 9, 2021, at 1:47 a.m. My dear mother has passed away. I am alone in this life. 🥺" (Song 3).

Feeling of exhaustion

The impact of grief symptoms on individuals during the loss and mourning process can cause cognitive and emotional exhaustion, leading to burnout. Indeed, the literature indicates that feelings of loss and fatigue can cause burnout syndrome in surviving individuals (Vega et al., 2017). When examining the emotions expressed by individuals in their comments, it is evident that burnout is occurring.

"I want to live, but I don't have the strength..."
(Song 1).

"The wound in my soul hurts more than pain; it's as if someone has put their hand in my chest, squeezing my heart and letting go. I haven't eaten in ten days, not even five meals. If I had the chance, I wish I could lose my memory, be empty, remember nothing..." (Song 1).

Persistent grief feelings

While feelings of grief may be mild in some individuals, in others they can be both severe and long-lasting. Even though people continue with their lives and try to adapt to their new circumstances, they may still carry their pain with them. There is only adaptation to emotions and grief reactions, and the complete resolution of grief is not an expected outcome. Commentators describe "unresolved grief" as follows, even after a significant amount of time has passed since the loss.

"I am 44 years old, it has been 21 years since I buried my father with my own hands, I have two daughters as tall as me, I am a father myself, but my pain still does not subside, I cannot get enough of my father." (Song 1).

"Losing someone you love is as interesting as losing a tooth. You feel the pain in that moment, but you feel the absence for the rest of your life." (Song 1).

"My father and I used to listen to it together. Every time I listened to it, I feared being without him, being tested. Now it's been 286 days without him, and not a single moment passes without the pain subsiding." (Song 2).

"You don't say goodbye to a mother; her grave will be buried in my heart for a lifetime, I suppose." (Song 2).

"Thirty-one years have passed since the day I lost my husband at the age of 22. The pain in my heart, soul, and mind has never ceased. My throat is knotted, and I've forgotten how to swallow. 🥺🥺🥺" (Song 1).

Looking at these accounts, it is clear that the pain and grief spread over a very long period of time. Therefore, it can be said that the pain did not subside, but rather that those left behind learned to live with it.

Losing joy and hope

As mentioned earlier, many emotions such as longing, guilt, and pain can be experienced together during the grieving process. However, prolonged feelings of grief can cause individuals to experience pain that they liken to a “wound.” Even when they are happy and joyful, individuals may suddenly be exposed to feelings of grief.

“My dear friend, whenever I listen to you, I remember you. My world was wet with the rain of your tears and it has not dried up. You were so young, you were our joy. You took our joy with you, you shot us both in the heart and in the head. You left us doomed to live with a wound inside us.” (Song 1).

“Even in my happiest moment, when I listen to it, my eyes fill with tears 😭” (Song 1).

“Where is this going, who is this longing for. I wonder how much longer it will go on like this. Tonight I hung my hopes and dreams, tonight I lost my love and feelings. I never really understood what it was like to live. How those who lived lived life. What they desired, what they gave up.” (Song 1).

Long-term feelings of mourning can affect individuals more deeply on special days and holidays. Since individuals want to see their relatives with them on special days and in happy moments (Yelboğa, 2024), they may find themselves in an atmosphere of deep grief in such situations.

“How many Eid mornings I wake up with pain inside. My dreams that I hope every year that the next Eid will be the way I want it to be.” (Song 1).

Seeking spiritual support

It is quite normal to grieve after a loss. However, healthy mourning is not always possible for every individual. Therefore, individuals may seek support from people to whom they can comfortably convey their feelings and listen to their pain. This attitude of the commentators shows that they are in search of support in a way. Sometimes people feel a sense of relief by using music that appeals to their emotions as a tool (Davidson & Garrido 2016). Participants draw attention to this situation with the emphasis on “touching the heart” and “translating to the soul”.

“This song feels like therapy, it’s so sincere that it touches the heart.” (Song 1).

“My mother was diagnosed with stomach cancer, and months earlier my uncle had passed away from stomach cancer. With the pain inside me, I keep opening this song and listening to it.” (Song 2).

“You can’t talk to anyone about your problems, you’re stuck in a bubble, you go back and forth between life and death, and this translates to my soul...” (Song 1).

The comments made under music videos, so to speak, translate emotions. Another participant's statement is as follows.

“I was 18 when I lost my parents, I met this song when I came to Turkey for university. When I listen to it, I feel as if I’m commiserating with someone. ❤️” (Song 1).

Comforting and empowering

Commenters try to empower and console others, sometimes by sharing their experiences and sometimes by empathizing.

“As if life is just a matter of saying stop. Come on, I’m telling you to stop. Did you think it would stop? Are you dreaming again? Don’t you know you’re not even allowed to dream? The best thing is to wrap yourself in your arms, let the world spin. Don’t be sad for what’s not yours, wait hopefully for the spring that will come after everything that’s gone from you” (Song 1).

“Love your troubles, they are a gift from Allah. Be patient, the one who tests you with troubles will surely reward you with a smile one day. May God heal all those who have troubles and cure those who are sick.” (Song 1).

Sometimes there is also prayer as part of consolation and strengthening.

“May Allah give peace to everyone’s heart 🤲” (Song 1).

“I wish patience to everyone, may God ease the pain of all of us,,, 🥺🥺🥺🥺. God, don’t leave anyone helpless...” (Song 1).

“May God help everyone who is suffering from the pain of a child, the pain of a parent...” (Song 1).

Empathy and compassion

Grieving individuals share their pain and mourning processes more comfortably with people who can understand their feelings and listen to them sincerely. Because they can feel better when their need to be understood is met. For this reason, it is important to approach the individual in the mourning process with empathy. Transmissions reflecting empathy and empathy are as follows.

"No one writes their troubles without knowing each other, and some don't have the strength to write and just read what is written. 😊" (Song 1).

"I read the comments, believe me, I felt the pain of all of you inside me, 😭😭😭😭" "I read many comments with tears, believe me, I forgot my own problem." (Song 1).

Write down your feelings and thoughts so that they remain as memories and keepsakes

Some of the commenters may come back later to look at these comments, read the comments made on their comment or leave a note to leave a memory.

"I'm 15 years old, my parents are dead ... today is my birthday, no one celebrated it, like it and keep it as a memory ❤️👉👉👉👉" (Song 1).

Some of the individuals who listen to and watch YouTube videos are simply curious about what other people go through during the grieving process and what emotions they experience, and may read the comments for this purpose.

"I've never seen a place as beautiful as the comment box of this folk song. Everyone sings their troubles, spills their heart out, to a person they've never met..." (Song 1).

Discussion and Conclusion

This study was conducted to analyze the emotions of the user comments made under three songs uploaded to the YouTube video site, one of the social media platforms, and selected in accordance with the research purpose. As a result of the examination and analysis conducted in this direction, it was seen that many users commented on the feelings of

grief under the music videos and generally referred to the emotions experienced during the grief process. It was observed that the data included expressions representing the feelings of shock, denial, sadness, pain, grief, feeling empty, longing, guilt, helplessness, loneliness and burnout. In addition, codes such as feelings of unending grief, loss of joy and hope, seeking spiritual support, consolation and empowerment, empathy and empathy emerged. The results of this study, which reveals feelings of grief and analyzes the comments made, show that the grief reactions written under music videos appear in parallel with Kübler-Ross's Five Stages of Grief Model. This is because grief reactions such as anger, denial, shock, and bargaining, which are explained in the stages of the model, are also represented in the coding of the data. Comments posted under YouTube music videos show that individuals who have lost a loved one listen to music that appeals to their emotions and express their feelings and thoughts in the comments section. In this respect, as noted in the literature, it can be said that music facilitates the processing and experience of emotions. The accessibility of digital environments and the fact that people experiencing similar emotions can comment in these environments has transformed these spaces into meeting/gathering places for people who have experienced loss and long for their loved ones.

According to these results, it can be said that today, social media platforms are used as a new medium where grieving individuals come together in digital environments and convey their pain and grief and share with other people in this direction. Communities are formed that share their grief on social media through comments. It is also stated that people use these environments as a way to maintain their ties with their lost loved ones by sharing memories and emotions. Therefore, it is accepted that online networks have a serious potential in mourning (Gibson, 2015). On the other hand, for social scientists, social media platforms offer data sets that are too large to ignore (Karamshuk et al., 2017). YouTube and other digital media can be used as public and cyber mourning spaces. Individuals who have lost their relatives/loved ones can process their emotions by consciously choosing YouTube music videos that appeal to their

emotions and sharing them with people they do not know. In this respect, the intention of users to watch and listen to these videos is to share pain and grief (Mattfeldt, 2024).

Social media platforms are increasingly gaining weight as a form in which death and grief are increasingly shared and mourning is processed. As such, social media spaces have assumed the role of new environments for mourners (Wagner, 2018). For this reason, studies try to reveal how mourning is processed in digital environments by analyzing media content (Al Sheikh, 2025). Music videos in digital environments can also be considered as a consolation tool as they confront people with death and allow them to re-experience difficult emotions (Mattfeldt, 2024). People can also comment on YouTube videos when they have recently lost someone close to them. For example, they can comment very early in their grief with expressions such as "I lost my mother today", "my father passed away yesterday", "I lost my brother a week ago" (Gibson, 2015). These comments fulfill the need to express sadness and to find someone else who understands them. It enables to reveal the inner world of hidden sadness by transforming it through interaction (Gibson, 2015). The emotional and cognitive reactions of grief are multidimensional such as shock, pain, sense of loss, anger, guilt, anxiety and fear, disorganization of mental processes, feeling overwhelmed, loneliness (Hablemitoğlu, 2021). One of the most important functions of social media networks is to provide emotional discharge (Willis & Ferrucci, 2017). Indeed, a study has shown that digital platforms enable the understanding of emotional expressions and facilitate the grieving process (Lee, 2011). Therefore, grieving individuals see digital platforms as places where grief emotions are processed and use them for this purpose. It is seen that many posts are made for basic emotions such as sadness, anger and disappointment (Waterloo et al., 2017).

Grief unquestionably has the potential to affect everyone in some way. This is because many emotional, cognitive, behavioral, physical and social changes occur during the mourning process. While people mourn their loved ones in social media environments, they also witness the feelings of others

about mourning and grief. Thus, grieving individuals can both find support and have the opportunity to regulate their emotions (Wagner, 2018). In a study conducted on Facebook, it is stated that such digital environments are a way of communicating with other grieving individuals (Gillian et al., 2013). It is also known that the YouTube platform provides a significant amount of communication and interaction with other grieving individuals (Lee, 2011). Therefore, the internet and social networks have the potential to change human life in many ways, and they show the same potential in death and grief (Walter et al., 2012). For this reason, digital environments are accepted as spaces where public grief is experienced (Gillian et al., 2013). According to the results of our study, individuals conveyed almost all emotions experienced during the mourning process. A study analyzing YouTube comments revealed that emotions such as sadness, grief, disappointment and anger are easily conveyed through YouTube (Lee, 2011). In this context, the narrative processes of emotional changes are clearly seen in YouTube comments (Gibson, 2015). The easy sharing of emotions, thoughts and experiences through YouTube significantly affects the grief journey of grieving individuals (Lee, 2011).

The constant accessibility provided by social media is seen as a memorial and a place of visitation for grieving individuals (Gillian et al., 2013). People continue to maintain their ties with their digitally lost loved ones through these environments (Walter et al., 2012). Especially young people's use of social media networks for mourning seems to change social norms of mourning (Carroll & Landry, 2010). The results and findings of previous studies on mourning in digital environments are in line with the findings of the current study.

This study is also important in terms of showing that increasingly widespread social media platforms are a new research area for different fields. In terms of subject matter, examining how emotion transfer is shaped on social media platforms and seeing that people consider digital environments as an area of sharing and interaction as a closer area of research and examination represents a change in the way of mourning.

According to the results of the study, individuals who have lost a close relative/loved one listen to YouTube music videos and share their feelings, thoughts and experiences related to loss and grief process in the comment sections. Especially songs representing emotions related to death and loss are used as a tool for some individuals to process and transfer emotions. In today's world where the internet and digital platforms are an important part of human life, these spaces have turned into a kind of "gathering/meeting" space for people about loss and grief, as in many other issues. In this respect, this study has clearly demonstrated that YouTube can function as a public mourning space for individuals who have experienced loss. This result brings a new perspective to the literature by supporting the claim that YouTube makes the repressed traditional aspects of grief visible. Another important finding of the study is that grief emotions such as shock, denial, sadness, pain, grief, longing, guilt, helplessness, feeling of loneliness, and hopelessness experienced during the grief process are clearly reflected in social media comments. Another important outcome of the study was that people who experienced loss used social media platforms as a means of connecting with the bereaved through the memories they shared and the comments they made. Again, looking at the comments made, it can be said that people in the mourning process experience emotional release and relief. In addition, while some of the commenters empowered other grieving individuals, others reflected their search for support in their comments. The fact that social media is always accessible has given digital platforms the characteristics of monuments and visits in the cultural context for grieving individuals. All these results clearly revealed that social media platforms in general and YouTube in particular have become "new spaces" where feelings of loss and grief are experienced, that mourners process/experience their feelings of grief through social media, and that digital platforms have the potential to change traditional norms of grief.

Future research could focus on loss and grief by including platforms such as Facebook, Instagram and X (twitter). This is because many social media

platforms and YouTube are 'diaries' for announcing, mourning and talking about death.

Limitations

First of all, this research has some limitations due to the quantitative diversity of social media platforms and digital media. The first limitation is related to the criterion of being related to death and mourning in determining music videos. The second limitation is related to the YouTube comments available at that time, as the research was conducted between May 10, 2025 and June 10, 2025. Another limitation is that the study was limited to YouTube, a digital video-music platform.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *This article does not contain any studies with human participants or animals performed by the author. Therefore, ethical approval was not required.*

Informed Consent: *Not applicable.*

Data Availability: *The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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2. Cerrahpaşa- Volkan Konak; (01.06.2025), <https://www.youtube.com/watch?v=z4UE5WzBSOU>
3. Yalan (Dünyada Ölümünden Başkası Yalan)- Candan Erçetin; (02.06.2025), <https://www.youtube.com/watch?v=zlviStCMzFk>

RESEARCH ARTICLE

Individual Privacy Perception in the Digital Age: The Interaction of Artificial Intelligence Attitude and Dependency

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Abstract

The increasing dependence on AI-supported services raises important questions about how positive beliefs about AI can turn into privacy risks. This study tests a gender-moderated mediation model of AI attitude, AI dependence, and online privacy concern (OPC) among Turkish university students. A cross-sectional survey conducted on 478 students using validated scales (AIAS-4, AI Dependency Scale, OPC Scale) was analyzed using structural equation modeling and the PROCESS Model 59. The measurement model demonstrated excellent fit ($\chi^2/df = 1.01$, CFI = 0.999, RMSEA = 0.005) and strong reliability-validity indicators. AI attitude significantly increased AI dependency ($\beta = .50$, $p < .001$), which in turn strengthened OPC ($\beta = .77$, $p < .001$). Gender moderates both relationships and reveals a significant moderator-mediation index (-11 ; 95% CI $[-.21, -.01]$). Overall, the model explains 28% of the variance in OPC. The findings reveal a two-way effect of positive AI attitudes: while promoting beneficial participation, they also increase dependency-based privacy concerns, particularly among female users. Organizations should integrate privacy-aware AI literacy and gender-sensitive feedback mechanisms into digital platforms to mitigate risks while maintaining trust.

Keywords: digitalization, AI attitude, AI dependence, online privacy concern.

Öz

YZ destekli hizmetlere olan bağımlılığın artması, YZ hakkındaki olumlu inançların nasıl gizlilik risklerine dönüştüğü konusunda önemli sorular ortaya çıkarmaktadır. Bu çalışma, Türk üniversite öğrencileri arasında YZ tutumu, YZ bağımlılığı ve çevrimiçi gizlilik endişesi (OPC) arasında cinsiyete bağlı, ılımlı arabuluculuk modelini test etmektedir. 478 öğrenci üzerinde yapılan kesitsel bir anket, geçerliliği kanıtlanmış ölçekler (AIAS-4, YZ Bağımlılık Ölçeği, OPC ölçeği) kullanılarak gerçekleştirilmiş ve yapısal eşitlik modellemesi, PROCESS Model 59 ile analiz edilmiştir. Ölçüm modeli mükemmel uyum ($\chi^2/df = 1,01$, CFI = 0,999, RMSEA = 0,005) ve güçlü güvenilirlik-geçerlilik göstergeleri sergilemiştir. YZ tutumu, YZ bağımlılığını önemli ölçüde artırmakta ($\beta = .50$, $p < .001$), bu da OPC'yi güçlendirmektedir ($\beta = .77$, $p < .001$). Cinsiyet, her iki bağlantıyı da moderatör olarak etkilemekte ve önemli bir moderatör-aracılık indeksi (-11 ; %95 CI $[-.21, -.01]$) ortaya çıkarmıştır. Genel olarak, model OPC varyansının %28'ini açıklamıştır. Bulgular, olumlu YZ tutumlarının iki yönlü bir etkisi olduğunu ortaya koymaktadır: faydalı katılımı teşvik ederken, özellikle kadın kullanıcılar arasında bağımlılığa dayalı gizlilik kaygılarını artırmaktadır. Kurumlar, güveni sürdürürken ortaya çıkan riskleri azaltmak için dijital platformlara gizlilik bilincine sahip YZ okuryazarlığı ve cinsiyete duyarlı geri bildirim mekanizmaları entegre etmelidir.

Anahtar Kelimeler: dijitalleşme, yapay zeka tutumu, yapay zeka bağımlılığı, çevrimiçi gizlilik endişesi

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Introduction

The rapid development of digital technologies is fundamentally transforming individuals' daily lives, communication patterns, and strategies for accessing information. In particular, the widespread use of artificial intelligence (AI)-based applications is reshaping individuals' behavior in digital environments and their perceptions of privacy (Li & Zhang, 2017). Despite the advantages offered by AI, such as automation, personalized services, and data analytics, the collection, processing, and interpretation of individuals' private data raise many ethical and psychological concerns (Maphosa, 2024).

In recent years, individuals' attitudes toward AI technologies have begun to play a decisive role in understanding their interaction with these technologies. Positive attitudes toward AI increase adaptation to technology and the level of use of digital services, while negative attitudes lead to increased distrust, uncertainty, and privacy concerns in the digital environment (Herbert et al., 2023). In this context, the interaction between individuals' levels of dependence on AI and their perceptions of digital privacy is an important issue that needs to be investigated.

AI dependency is defined by symptoms such as a constant desire for access to these technologies, developing excessive trust in AI, and an increase in the use of AI in everyday decision-making processes (Morales-García et al., 2024). Such dependency can create a situation that conflicts with individuals' privacy expectations, as high AI usage may imply the sharing of more personal data and potential exposure to privacy violations (Elliott & Soifer, 2022). On the other hand, some individuals refrain from using AI technologies and resist them at the expense of protecting their privacy.

This study aims to explain how university students' individual perceptions of privacy are related to their attitudes toward AI and their levels of AI dependency. Considering that today's young individuals are among the groups that adapt most quickly to digitalization and are also most exposed to privacy violations, explaining this relationship will fill an important gap in both theoretical and practical terms. Furthermore, this study aims to provide important insights into how the digital age

has created an ethical and psychological transformation at the individual level.

Conceptual Framework

The Evolution of Digital Privacy Concerns

Online privacy concern (OPC) refers to the level of perception that individuals have regarding the risk of their personal data being accessed without authorization or misused (Buchanan et al., 2007). With the rapid spread of AI applications in recent years, OPC has become a multidimensional and dynamic problem area that needs to be managed in digital life. Therefore, establishing a sustainable environment of trust in the online ecosystem requires the redesign of privacy protection strategies based on comprehensive, proactive, and ethical principles.

One of the most critical threats emerging in the field of privacy with the development of AI is the processing of biometric data without the user's consent. In particular, face analysis-based models do not merely verify identity; they can also predict a person's age, gender, and even their potential political and religious affiliations (Kosinski et al., 2024). This predictive capacity increases the risk of "biometric privacy violations" that individuals cannot control and extends the scope of the GDPR beyond traditional data breaches. Therefore, privacy protection strategies must be supported by technical and legal multi-layered measures that clearly define the ethical boundaries of advanced AI applications such as facial recognition systems.

When examining the reflections of privacy concerns in different contexts, the education ecosystem presents notable results. Generative AI-supported exam monitoring tools, while aiming to reduce cheating behavior, create a sense of constant surveillance over students, thereby strengthening the perception of privacy violations and weakening the intention to use the platform (Nigam et al., 2021). This situation demonstrates the need for educational institutions to re-examine the balance between security and privacy. On the other hand, a recent systematic review examining the measurement literature reveals significant gaps in privacy research conducted on emerging technologies such as IoT, AI, augmented reality, and big data. The

study reveals that contextual variables such as data sensitivity, recipient transparency, and transmission principles play critical roles in shaping privacy concerns and related behaviors, yet are often overlooked in most research. Additionally, it emphasizes that theoretical models developed based on traditional technologies are insufficient in explaining the multi-layered structure of modern digital environments. These findings, which comprehensively address psychological precursors, behavioral outcomes, and conceptual frameworks, necessitate the redesign of privacy research in the AI era with context-sensitive and interdisciplinary approaches (Herriger et al., 2025).

Attitudes Towards Artificial Intelligence

Attitudes toward AI encompass individuals' general beliefs about the extent to which they find this technology useful, reliable, and ethical. The four-item AI Attitude Scale (AIAS-4) developed by Grassini (2023) has been found to significantly predict AI usage intentions. Ibrahim et al. (2025) also validated the Extended Technology Acceptance Model (TAM-X) in the context of AI applications in their empirical study, reporting that perceived usefulness has an effect on attitude with a β value of 0.34. In addition to these findings, the literature shows that the "AI mindset" (growth/fixed tendency) variable is also a strong determinant of attitude (Yadrovskaya et al., 2023). Therefore, a positive attitude not only increases usage intention but also usage frequency and depth, which may trigger dependency or excessive usage risks.

Adaptation studies emphasize that AI attitude scales maintain cross-cultural equivalence of meaning, but adding ethical concerns and perceived fairness dimensions to the scales increases their explanatory power (Satici et al., 2025). Indeed, recent meta-analyses report that positive AI attitudes lead to increased productivity, trust in decision-making processes, and reduced cognitive load, while negative attitudes lead to technology rejection, increased privacy concerns, and organizational resistance behaviors (Emon, 2024). Thus, both the mechanisms that encourage AI adoption are better understood, and the potential risks of de-

pendency and privacy violations can be anticipated at an early stage. Building on this evidence—showing that favorable AI attitudes foster more frequent and intensive use, which can in turn nurture dependence—we advance the following hypothesis:

H1. *AI Attitude is positively associated with AI Dependency among university students.*

Artificial Intelligence Dependency

AI dependency is defined as the partial or complete loss of self-control over decision-making as a result of an individual's excessive reliance on AI systems in cognitive and behavioral processes. To measure this concept, Morales-García et al. (2024) consists of four subscales (loss of control, compulsive use, avoidance, and negative consequences). The results of the confirmatory factor analysis in the Turkish adaptation report AVE = 0.61 and CR = 0.87 (Savaş, 2024). These findings indicate that the scale maintains its validity and reliability, demonstrating that AI dependency can be measured consistently across cultural contexts.

Recent studies focusing on the cognitive effects of dependency have shown that intensive use of AI-based learning aids increases information processing load, which in turn reinforces perceptions of online privacy violations (Menard & Bott, 2025; Shrestha et al., 2024). High cognitive load directs users toward algorithms that offer faster and easier decisions; however, the scope of personal data sharing is often overlooked in this process. Therefore, dependency not only creates negative effects on psychological well-being but also undermines the sense of privacy by increasing privacy risks.

Recent years have witnessed a rapid accumulation of empirical evidence centered on the phenomenon of AI dependency. A systematic review by Zhai, Wibowo, and Li (2024) shows that the intensive use of generative language models in educational settings deepens dependency by creating a "cognitive shortcut" effect on decision-making, critical thinking, and analytical reasoning. Likewise, Zhang et al. (2024), in a multivariate analysis of ChatGPT users, found that academic self-efficacy and academic stress indirectly foster AI-de-

dependency behavior and documented consequences such as reduced creativity, misinformation diffusion, and weakened critical thinking. Focusing on the adverse impact of dependency on decision quality, Vasconcelos et al. (2023) experimentally demonstrated that properly designed explanatory interfaces can curb users' tendency to over-rely on erroneous AI advice. From a socio-emotional perspective, a qualitative study by Baylor et al. (2025) revealed that long-term interactions with AI companions such as Replica establish parasocial bonds, producing a "relationship-based dependency" that undermines user autonomy. Collectively, these findings underscore that AI dependency is a multilayered phenomenon encompassing cognitive, emotional, and social dimensions, thereby enriching the theoretical framework of the present study.

On the other hand, the perception of autopilot emerging in the context of decision support demonstrates that dependency can also have serious consequences at the organizational level. Users who are constantly fed AI feedback increase their decision confidence in the short term; however, in the long term, they experience cognitive passivity and weaken their critical inquiry skills (Fossa, 2025). This situation can lead to a decline in individual autonomy and algorithmic singularity in corporate decision-making processes. In conclusion, AI dependency creates a dual-sided pressure on both psychological well-being and privacy perception; therefore, developing awareness training to reduce dependency risks, responsible AI design principles, and regulatory guidelines is becoming increasingly important. Building on the empirical evidence reviewed above—showing that excessive reliance on AI systems heightens cognitive load, lowers critical thinking, and ultimately amplifies users' sense of vulnerability—we articulate three further hypotheses that anchor the remainder of the research model:

H2. *AI Dependency is positively associated with Online Privacy Concern among university students.* (Menard & Bott, 2025; Shrestha et al., 2024)

H3. *AI Attitude exhibits a statistically significant total effect on Online Privacy Concern.*

This expectation reflects mixed findings in the literature: while favorable attitudes may increase

exposure—and thus perceived risk—negative attitudes have been linked to heightened privacy worry (Emon, 2024; Herriger et al., 2025).

H4. *Net of the indirect pathway through AI Dependency, AI Attitude exerts a residual direct negative effect on Online Privacy Concern.*

In other words, once the mediating role of dependency is partialled out, a positive attitude toward AI is expected to reduce privacy concern by lowering risk salience (Ibrahim et al., 2025; Vasconcelos et al., 2023).

These hypotheses complement H1 by clarifying both the downstream impact of dependency on privacy concerns (H2) and the overall versus direct pathways linking AI attitude to those concerns (H3–H4).

The Moderating Role of Gender

In online environments, women generally exhibit higher privacy sensitivity and risk awareness compared to men (Fogel & Nehmad, 2009). Meta-analytic findings indicate that women have significantly higher levels of concern regarding the unauthorized use of their personal data (Tifferet, 2019). In contrast, the mitigating effect of positive technology attitudes on privacy concerns may follow a steeper slope among women due to the "trust-vulnerability paradox" (Hoy & Milne, 2010).

Gender differences have also become apparent in the context of AI dependency. These findings suggest that the gendered privacy calculus approach (cultural socialization and cognitive frameworks differentiating data sharing decisions) may also be valid in the AI ecosystem. Therefore, it is predicted that gender may significantly influence (i) the direct path from AI Attitude to Privacy Concerns, (ii) the intensity of the path from AI Dependency to Privacy Concerns, and (iii) the regulated (gender-dependent) mediation mechanism operating through these two paths. Based on these reasons, hypotheses H5–H7 have been developed.

H5. *Gender moderates the relationship between AI Dependency and Online Privacy Concern.*

H6. *Gender moderates the direct relationship between AI Attitude and Online Privacy Concern.*

H7. *Gender moderates the indirect effect of AI Attitude on Online Privacy Concern via AI Dependency (index of moderated mediation).*

Theoretical Approaches and Inter-Variable Dynamics

Technology Acceptance Model (TAM): The perceived benefit $\rightarrow$ attitude $\rightarrow$ usage intention chain remains valid in the AI context (Zhang, Hu & Zhou, 2025).

Socio-Technical Systems Theory: AI is evaluated as an “entangled” structure where technical components and social values are intertwined; this links social outcomes such as privacy concerns to technical design (Degeling, 2016).

Privacy Calculus: Users decide whether to share data by weighing perceived benefits and risks; AI dependency can skew this balance in favor of benefits, delaying risk perception (Rohden & Zeferino, 2023; Said et al., 2023).

Explainable AI (XAI): Providing explanations enhances system trust; however, detailed explanations may create unexpected risk awareness among users (Golda et al., 2024; Hyra & Premti, 2024).

This theoretical framework provides a comprehensive framework for explaining how the triad of AI attitude, dependency, and privacy concerns interact.

Research Model and Hypothesis Development

The conceptual framework addressed in this study is presented in Figure 1. The model assumes that attitudes toward AI (X) first influence AI dependency (M) and then online privacy concerns (Y). Furthermore, it is predicted that gender (W) conditions these relationships through both direct and indirect pathways.

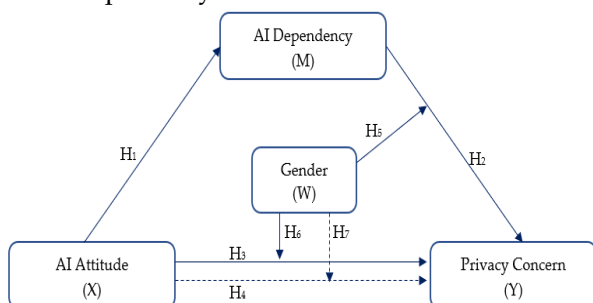


Figure 1. Research Model

When examining Figure 1, a positive relationship in the direction of $X \rightarrow M$ is tested under the

H1 hypothesis. H2 reveals the effect of M on Y, while H3 and H4 evaluate the total and direct effects of X on Y by assessing the mediation mechanism. Hypotheses H5, H6, and H7 reveal the moderating role of gender (W) on both indirect ($M \rightarrow Y$) and direct ($X \rightarrow Y$) pathways, thereby explaining the gender-differentiated dynamics of privacy concerns within the model.

The research hypotheses formulated in line with the conceptual model summarized in Figure 1, their theoretical background, and the expected relationship directions are presented in detail in Table 1.

Table 1. Hypotheses related to the research model

Hypothesis	Path	Theoretical Background	Expected relationship
H1	$X \rightarrow M$	Zhang vd., 2025	Positive
H2	$M \rightarrow Y$	Shrestha vd., 2024	Positive
H3	$X \rightarrow Y (c')$	Nigam vd., 2021	Empirically oriented
H4	$X \rightarrow M \rightarrow Y$	Fossa, 2025; Degeling, 2016	Indirect effect
H5	$W \times M \rightarrow Y$	Fogel & Nehmad, 2009; Tifferet, 2019	-
H6	$W \times X \rightarrow Y$	Hoy & Milne, 2010	-
H7	$W(\text{mediation})$	Barnes & Pressey, 2012	-

The hypotheses listed in Table 1 are tested through quantitative analyses described in the following section; thus, the holistic interaction between AI attitude, dependency, and privacy concerns is validated through structural equation modeling.

Method

Research Objective and Ethics

This study is conducted using a quantitative approach and a cross-sectional survey design. The research model aims to examine the direct and indirect relationships between the variables Artificial Intelligence Attitude (AIA) $\rightarrow$ Artificial Intelligence Dependency (AID) $\rightarrow$ Privacy Concerns (PC) through structural equation modeling (SEM).

Existing work rarely integrates AI attitude, AI dependency, and online privacy concern within a single, gender-contingent mediation model, and almost none of that evidence derives from emerging-economy contexts. By empirically testing this moderated-mediation framework among Turkish

university students, the present study fills both gaps and advances the privacy-calculus and socio-technical literatures with cross-cultural, gender-sensitive insights.

The research has been approved by the Ethics Committee of the Faculty of Social and Human Sciences at Uşak University under decision number 2025-151. Participants were informed about the purpose of the study, privacy guarantees, and voluntary participation conditions; those who selected the “I have read, understood, and agree” option in the online form proceeded to the survey. All data are anonymized in accordance with the principles of the General Data Protection Regulation (GDPR) and stored in a manner accessible only to the research team.

Data Collection Process

The study population consists of undergraduate students enrolled at state universities in Türkiye. The sample is selected using convenience sampling and accessed through a mixed online-face-to-face distribution strategy.

- **Target sample size:** At least $N = 400$. (Kline, 2013; 10:1 observation–parameter ratio; sufficient for 80% power and medium effect size for mediation testing.)
- **Inclusion criteria:** (i) Being between 18 and 30 years old, (ii) Having used AI-based tools at least once, (iii) Agreeing to participate in the research voluntarily.
- **Demographic variables:** Gender, age, class level, and perceived technological competence in the department are recorded as control variables.

Research data are collected through a cross-sectional and quantitative survey from undergraduate students aged 18–30 enrolled at state universities in Türkiye. The survey form first presents an informed consent statement to obtain participant approval; it then includes a psychometric section consisting of a total of 23 items structured using a five-point Likert scale. This section measures AI Attitude using the four-item AI Attitude Scale (AIAS-4) (Grassini, 2023; Satıcı et al., 2025), AI Dependency using the five-item Dependence on AI Scale (DAI-5) (Morales-García et al., 2024; Savaş, 2024) and Privacy Concerns are measured using

the 14-item Online Privacy Concern Scale (OPC-14) (Buchanan et al., 2007; Alakurt, 2017). The demographic section includes gender (Female/Male), age (open-ended), education level (High School, Associate Degree, Bachelor's Degree, Postgraduate), average daily internet usage (hours), owned technological devices (multiple choice: Desktop computer, Laptop, Tablet, Smartphone, other) and self-assessed technology knowledge (Low, Medium, High) are included; these variables are used as control variables in the structural model.

Data are collected during the spring semester of 2025. Participants are provided with an information letter and an informed consent form; students who give their consent are directed to the survey. Participants who access the online form complete all scales in a single session; in face-to-face applications, the paper-and-pencil method is used under the supervision of the research team. The average completion time is measured as 4–5 minutes.

Data Analysis

After the data set was transferred to SPSS 25 and AMOS 24, basic assumption checks were performed. Missing values are imputed using the “expectation–maximization” or mean imputation method as long as the proportion of missing values does not exceed 5% of the total observations; for higher missing value rates, multiple imputation techniques are recommended (Little & Rubin, 2019; Byrne, 2013). In this study, missing values were excluded from the analysis to avoid any bias in the data. Univariate normality skewness-kurtosis z values are assessed with the condition $|z| < 3$, while multicollinearity is assessed with the threshold $VIF < 5$ (Hair, Black, Babin, & Anderson, 2020). The internal consistency of the scales is considered acceptable with Cronbach's α values of .70 and above (Nunnally & Bernstein, 1994); composite reliability (CR) is also supported by the same .70 threshold. Based on confirmatory factor analysis, model fit is considered acceptable if the following criteria are met: $\chi^2/df < 3$, CFI-TLI $\geq .90$ (preferably $\geq .95$), and RMSEA $\leq .08$ (preferably $\leq .06$) (Hu & Bentler, 1999). Convergent validity is tested using the criterion of AVE $\geq .50$ criterion, while discriminant validity is tested by ensuring that the root

AVE values in the Fornell-Larcker matrix are greater than the related factor correlations (Fornell & Larcker, 1981); keeping the HTMT ratio below .85 also provides additional assurance (Henseler, Ringle, & Sarstedt, 2015). To assess the risk of common method variance, it is sufficient for the total variance to remain below 50% in Harman's single-factor test (Podsakoff, MacKenzie, & Podsakoff, 2012).

Following the validation of the measurement model, a structural equation model is constructed, and research hypotheses are estimated using the maximum likelihood method. The significance of standardized coefficients for the paths of AI Attitude on AI Dependency, Dependency on Privacy Concerns, and Attitude directly on Privacy Concerns are evaluated; Values of 0.10 or below are considered weak effects, values between 0.30 and 0.50 are considered moderate effects, and values above 0.50 are considered strong effects (Cohen, 1988). The mediating relationship is examined using a bias-corrected bootstrap method with 5,000 samples; an indirect effect is considered significant when the 95% confidence interval does not include zero (Preacher & Hayes, 2008). Gender, age, education level, internet usage duration, device ownership, and self-reported technology knowledge variables are included in the model as covariates; if measurement invariance is required, sequential constraints are tested in the multi-group analysis using the criterion $\Delta CFI \leq .010$ (Cheung & Rensvold, 2002).

Results

Of the total 478 students who participated in the study, 57.1% ($n = 273$) were female and 42.9% ($n = 205$) were male. The ages ranged from 18 to 28, with the majority of participants, 67.8% ($n = 324$), falling within the 21–24 age group. The educational level distribution was as follows: high school (5.2%, $n = 25$), associate degree (23.8%, $n = 114$), bachelor's degree (54.6%, $n = 261$), and graduate degree (16.3%, $n = 78$).

The daily internet usage time ranges from 1 to 10 hours, with an average of $M = 5.13$ hours ($SD = 2.02$). According to participants' self-assessments, the level of technology knowledge is reported as

“low” by 19.2% ($n = 92$), ‘moderate’ by 50.4% ($n = 241$), and “high” by 30.3% ($n = 145$).

Table 2. Reliability Values

	n	Cronbach' α	AVE	CR
Privacy Concerns	14	0.913	0.506	0.935
AI Attitude Scale (AIAS-4)	4	0.773	0.511	0.807
AI Dependency	5	0.795	0.525	0.846
Total	23	0.866		

The measurement quality of the three scales used in the data collection process was examined in detail, and the findings are presented in Table 2. The internal consistency coefficients (Cronbach α) obtained from the scales were above .70, and the composite reliability values were above .80, indicating that all three scales have acceptable levels of reliability (Nunnally & Bernstein, 1994). The average variance explained (AVE), which is a criterion for convergent validity, exceeded the threshold value of .50 in all dimensions; standardized factor loadings ranged from .60 to .78, indicating that the measurements adequately represent the target structures (Hair et al., 2020). Furthermore, Harman's one-factor test results, conducted to examine whether all item responses could be grouped under a single factor, showed that the first factor explained only 27.93% of the total variance; this ratio is well below the recommended 50% threshold, indicating that common method variance (CMV) does not pose a critical threat (Podsakoff et al., 2012).

When examining the fit statistics obtained at the end of the confirmatory factor analysis, the model's chi-square value was found to be low enough to be generalized to the population, $\chi^2(227) = 229.43$, $p = .442$; thus, the χ^2/df ratio is 1.01 and well within the recommended < 3 threshold (Hu & Bentler, 1999). Other absolute and incremental fit indices are also within acceptable limits: GFI = .960, AGFI = .951, IFI = .999, TLI = .999, and CFI = .999. The Root Mean Square Error of Approximation (RMSEA) is .005, which falls within the 90% confidence interval [.000, .020], and the PCLOSE value of 1.000 supports the likelihood of the model having excellent fit; the model's RMR value is also .033, which is below .08 (Hair et al., 2020). Additionally, parsimony-based measures were reported as PNFI = .848 and PCFI = .897; AIC = 327.43 and ECVI = .686

values indicate that the model exhibits a more economical fit compared to a saturated model. Hoelter's critical sample size of 548 at the .05 level and 582 at the .01 level indicates that the current sample ($N = 478$) is sufficient for structural model estimations.

This combination meets all recommended thresholds ($CFI/TLI \geq .95$, $RMSEA \leq .06$, $\chi^2/df \leq 3$), indicating that the measurement model is highly consistent with the data. Thus, the AI Attitude, AI Dependency, and Online Privacy Concerns scales are reliable and valid in the research sample, providing a solid foundation for testing the hypotheses in the structural model. When attitude and gender are included, the explained variance in the AI dependency equation is $R^2 = .24$; the Y equation in the full model is $R^2 = .28$, with the interaction terms created with gender explaining 1.4% of the additional variance ($\Delta R^2 = .006 + .008$).

The multilevel results examining the relationship between AI Attitude (X) and Online Privacy Concerns (Y) through AI Dependency (M) and moderated by Gender (W) using the Hayes Process Model 59 are summarized in Table 3.

Table 3. Mediation and Moderation Analysis results

Section	Effect	b	SE	t	p	LLCI	ULCI
Path coefficients	$X \rightarrow Y$	0.504	0.116	4.360	< .001	0.277	0.732
Path coefficients	$M \rightarrow Y$	0.770	0.125	6.150	< .001	0.524	1.016.0
Path coefficients	$X \rightarrow Y (c')$	-0.623	0.120	-5.200	< .001	-0.858	-0.388
Path coefficients	$M \times W \rightarrow Y$	-0.198	0.086	-2.320	0.021	-0.367	-0.030
Conditional direct effects (c')	$W(1)$	-0.475	0.053	-9.000	< .001	-0.579	-0.371
Conditional direct effects (c')	$W(2)$	-0.327	0.057	-5.770	< .001	-0.438	-0.215
Conditional indirect effects	$W(1)$ (boot)	0.270	0.040			0.195	0.350
Conditional indirect effects	$W(2)$ (boot)	0.165	0.034			0.102	0.236
Moderated mediation index	$W(1) - W(2)$ (boot)	-0.106	0.051			-0.206	-0.006

Table 4. Summary of hypothesis testing results

Hypothesis	Path	Effect B (SE)	t/z	p	95 % CI	Support
H1	$X \rightarrow M$	0.504 (0.116)	4.36	<0.001	0.28, 0.73	Supported
H2	$M \rightarrow Y$	0.770 (0.125)	6.15	<0.001	0.52, 1.02	Supported
H3	$X \rightarrow Y (c')$	-0.623 (0.120)	-5.20	<0.001	-0.86, -0.39	Supported
H4	$X \rightarrow M \rightarrow Y$	—	—	—	—	Supported
H5	$W \times M \rightarrow Y$	-0.198 (0.086)	-2.32	.021	-0.37, -0.03	Supported
H6	$W \times X \rightarrow Y$	0.148 (0.077)	1.92	.056	-0.00, 0.30	Not Supported
H7	$W(\text{mediation})$	—	—	—	-0.206, -0.006	Supported

AI Attitude (X) significantly predicts AI dependency (M), $b = .50$, $SE = .12$, $t = 4.36$, $p < .001$, 95% CI [.28, .73]; dependency also positively and strongly increases privacy concerns (Y), $b = .77$, $SE = .13$, $t = 6.15$, $p < .001$, 95% CI [.52, 1.02]. The direct

effect of attitude on anxiety is negative ($b = -.62$, $SE = .12$, $t = -5.20$, $p < .001$), indicating that while a positive attitude indirectly increases anxiety through dependency, it directly reduces anxiety.

The gender variable (W) plays a significant moderating role in these relationships. The direct effect is more pronounced in women ($b = -.48$, $p < .001$) and the indirect effect is also larger (boot = .27, 95% CI [.20, .35]); the corresponding values for men are $b = -.33$ and boot = .17. The moderation-dependent mediation index is significant ($-.11$, 95% CI $[-.21, -.01]$), indicating that the strength of the attitude $\rightarrow$ dependency $\rightarrow$ anxiety pathway is higher in women than in men. In other words, female students with positive AI attitudes are more exposed to AI dependency and then privacy anxiety than males; however, the direct effect of positive attitudes in reducing anxiety is also stronger in females. These results reveal that AI applications are perceived differently in a gender context and that gender-sensitive strategies should be developed in interventions. The results related to the hypotheses are summarized in Table 4.

Discussion

The findings of this study show that individuals' perceptions of privacy in the digital age are intricately intertwined with their attitudes toward AI

and dependency dynamics. First, it was found that positive AI attitudes significantly increased AI dependency ($\beta = .50$) and, consequently, increased privacy concerns ($\beta = .77$). This result is consistent with recent studies suggesting that positive attitudes open the door to more intensive AI use and, over time, trigger a sense of “loss of control,” paralleling the TAM-X “perceived benefit $\rightarrow$ usage tendency” chain (Ibrahim et al., 2025). Additionally, the direct negative effect of attitude on privacy concerns ($\beta = -.62$) is noteworthy; this inverse relationship suggests that individuals with positive attitudes initially suppress their risk perceptions because they perceive AI as more reliable, but increasing dependency weakens this “trust shield.” A similar two-way pattern intersects with discussions of the “comfort–risk paradox” observed in generative AI-based exam monitoring systems (Nigam et al., 2021). Recent large-scale investigations further corroborate this trajectory: systematic reviews and multivariate studies have shown that intensive reliance on generative AI produces “cognitive offloading” effects that erode critical-thinking and analytical-reasoning capacities, thereby amplifying privacy-related vulnerabilities (Zhai et al., 2024; Zhang et al., 2024; Shrestha et al., 2024; Menard & Bott, 2025).

Second, the significant indirect role of gender adds a new dimension to the gender differences increasingly emphasized in the literature. The findings indicate that female participants exhibit higher sensitivity to AI dependency-related risk perceptions compared to males, yet the direct mitigating effect of positive attitudes on privacy concerns is stronger among women. This “dual effect” is consistent with recent experimental data indicating that fears of biometric privacy violations are more pronounced among women (Kosinski et al., 2024) and supports theories of how “protection motivation” differs by gender in digital environments. Consistent with this pattern, Kosinski, Khambatta, and Wang (2024) illustrate that female users display heightened sensitivity to biometric privacy risks, while meta-analytic evidence indicates that women’s stronger privacy concerns can temper otherwise positive technology attitudes (Tifferet, 2019; Herriger et al., 2025), thus reinforcing the gendered “trust–vulnerability paradox.”

Furthermore, when considered alongside findings emphasizing that AI dependency undermines cognitive autonomy through the “decision support paradox” (Fossa, 2025), it becomes clear that privacy concerns are not merely about the fear of data leaks but are also shaped by risks of cognitive and behavioral dependency.

Extending beyond individual differences, design choices also shape dependency-driven privacy threats: socio-technical work emphasizes that omitting transparency and equity safeguards can magnify such risks (Degeling et al., 2016), whereas explanatory interfaces have been shown to mitigate over-reliance on algorithmic outputs (Vasconcelos et al., 2023). Embedding deliberate “friction” and clear data-use disclosures in AI interfaces may therefore serve as a practical antidote to autonomy erosion.

Finally, these results offer important contributions to both theory and practice. On the theoretical level, the study’s model integrates the “privacy calculus” and socio-technical systems literature by revealing the indirect–direct opposing effects of AI attitudes on privacy concerns (Rohden & Zeferino, 2023; Said et al., 2023). In practice, AI-based service designers must strengthen personal data transparency and dependency-preventing feedback mechanisms, particularly for female users. Educational institutions and platform providers can reduce dependency-related risks while preserving the beneficial aspects of positive attitudes by incorporating privacy awareness modules into AI literacy programs. Future research could use longitudinal designs to examine the evolution of dependency over time and the mediating–regulatory roles of gender in different cultural contexts; it should also explore the potential balancing effects of explainable AI solutions on these dynamics.

Conclusion

This study reveals how individuals’ perceptions of privacy in the digital age are shaped by their attitudes toward and dependence on AI from a multi-dimensional perspective. The findings reveal that positive attitudes toward AI increase users’ dependence on AI systems in their decision-making processes; this dependence, in turn, significantly

elevates online privacy concerns. At the same time, the direct effect of attitude on privacy concerns is negative, indicating that individuals who find technology useful initially suppress their risk perception; however, increasing levels of dependence render this suppression unsustainable. The gender variable's moderating effect on the indirect impact reveals that female users are positioned at more extreme levels in terms of both benefit expectations and risk sensitivity, contributing significantly to the limited literature on the gender dimension.

Theoretically, the study integrates technology acceptance theory, the socio-technical systems approach, and the privacy calculus framework to position AI dependency as an explanatory mechanism. This comprehensive model emphasizes that the dependency variable should not be overlooked in future AI-focused behavioral research. In practice, designers and policymakers are recommended to strengthen transparent data flow and dependency-preventing feedback mechanisms in AI-based services, especially for female users.

Due to its cross-sectional design, the study has limitations regarding causality; furthermore, as the sample consists only of university students, the findings cannot be directly generalized to a wider population. Future studies are recommended to track the evolution of dependency over time using longitudinal data sets, examine the role of gender in different cultural contexts, and investigate the balancing effects of explainable AI interventions on these dynamics. In conclusion, this study sheds light on the interaction between AI attitudes and dependency from a gender perspective, thereby guiding both theory and practical applications in the digital privacy literature.

Declarations

Funding: No funding was received for conducting this study.

Conflicts of Interest: The author declares no conflict of interest.

Ethical Approval: This research was approved by the Ethics Committee of the Faculty of Social and Human Sciences at Uşak University (Decision No: 2025-151).

Informed Consent: Informed consent was obtained from all participants before they took part in the study.

Data Availability: The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

AI Disclosure: No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.

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RESEARCH ARTICLE

Performing The Self Online: University Students' Identity Construction on Social Media

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Abstract

This study investigates how university students construct and manage their identities on social media platforms, including Instagram, TikTok, and X. Using a communication-oriented framework, the study examines the strategies students employ to present themselves online, with attention to authenticity, audience perception, and the emotional impact of peer feedback. Data were collected through semi-structured interviews at a public university in Türkiye. Thematic analysis revealed six key themes across five research questions: selective authenticity, platform-specific self-presentation, audience awareness and context collapse, peer feedback and emotional influence, privacy boundaries, and the tension between authenticity and impression management. Findings indicate that students engage in curated yet emotionally sincere self-expressions, adapting their content based on mood, platform norms, and intended audiences. While some maintain consistency between online and offline identities, others adopt varying personas across platforms to manage visibility and control perception. Peer validation emerged as a significant emotional factor influencing posting behaviour. The study contributes to a deeper understanding of identity as a dynamic, communicative process shaped by digital environments and highlights the emotional labour involved in balancing personal authenticity with social expectations.

Keywords: Digital identity, Self-presentation, University students, Social media, Identity construction

Öz

Bu araştırma, üniversite öğrencilerinin Instagram, TikTok ve X gibi sosyal medya platformlarında kimliklerini nasıl inşa ettiklerini ve yönettiklerini incelemektedir. İletişim odaklı bir kuramsal çerçeveye yürütülen çalışmada, öğrencilerin dijital ortamlarda kendilerini nasıl sundukları; özgünlük, hedef kitle algısı ve akran geri bildirimlerinin duygusal etkisi gibi unsurlar üzerinden ele alınmıştır. Veriler, Türkiye'deki bir devlet üniversitesinde öğrenim gören öğrencilerle yapılan yarı yapılandırılmış görüşmelerle toplanmıştır. Tematik analiz sonucunda beş araştırma sorusu çerçevesinde altı temel tema ortaya çıkmıştır: seçici özgünlük, platforma özgü benlik sunumu, hedef kitle farkındalığı ve bağlam çökmesi, akran geri bildirimi ve duygusal etkiler, mahremiyet sınırları ve özgünlük-izlenim yönetimi arasındaki gerilim. Bulgular, öğrencilerin duygusal olarak içten ancak özenle seçilmiş içerikler paylaştıklarını; ruh halleri, platform kültürü ve hitap ettikleri kitleye göre içeriklerini bilinçli biçimde uyarladıklarını göstermektedir. Bazı katılımcılar dijital ve yüz yüze kimlikleri arasında tutarlılık olduğunu ifade ederken, bazıları ise görünürlüklerini ve dış algıyı yönetebilmek adına farklı platformlarda farklı kimlikler benimzediklerini belirtmiştir. Akranlardan gelen beğeni ve yorumların, paylaşım kararlarını etkileyen önemli bir duygusal unsur olduğu görülmüştür. Bu çalışma, dijital kimliğin değişken ve iletişimsel bir süreç olduğunu vurgularken; genç yetişkinlerin özgünlük ile toplumsal beklentiler arasında kurdukları dengeyi sürdürme çabalarının içerdiği duygusal emeği de görünür kılmaktadır.

Anahtar Kelimeler: Dijital kimlik, Benlik sunumu, Üniversite öğrencileri, Sosyal medya, Kimlik inşası.

Introduction

In an increasingly digitized social landscape, identity is no longer constructed solely through face-to-face interactions but is also continuously shaped and negotiated through digital platforms. For university students, who are navigating the transition into adulthood, social media provides a primary space for self-expression, social connection, and identity exploration. Platforms like Instagram, TikTok, and X allow users to create curated profiles, share moments, and receive instant feedback in the form of likes, comments, and views. These platforms do not simply host content; they structure and influence how users think about themselves and how they present that self to others.

The communicative practices involved in digital self-presentation have become a central concern within communication studies. While earlier scholarship focused on interpersonal communication in face-to-face settings, recent work has expanded to examine how identity is performed and experienced in digitally mediated environments. Concepts, such as audience fragmentation, context collapse, and platform affordances have illuminated how social media complicates traditional notions of identity, privacy, and authenticity.

Despite this growing interest, much of the existing research has focused on influencers, adolescents, or general youth culture in Western contexts, often overlooking the everyday experiences of ordinary university students navigating these dynamics. There remains a lack of qualitative, context-sensitive studies that capture how students reflect on and engage with their digital identities, particularly in non-Western or less-studied educational settings. Furthermore, while strategic self-presentation has been widely theorized, fewer studies explore the emotional labour, reflexivity, and internal negotiations involved in balancing authenticity with impression management on social media.

This study aims to address this gap by investigating how university students construct and perform their identities on social media platforms. It examines the communicative strategies students use to navigate online self-presentation, the factors that influence their decisions about what to share

or conceal, and their perceptions of audience, feedback, and authenticity. By centring students' own narratives, the research contributes to a deeper understanding of identity construction as a situated, reflexive, and communicative process within contemporary digital life.

Research Problem

Social media has become a central space where individuals construct, negotiate, and perform their identities. For university students—who are in a formative stage of both personal and social identity development—these platforms offer a unique arena to explore self-presentation, build social capital, and manage impressions in front of multiple audiences. The merging of public and private spheres on platforms like Instagram and TikTok creates both opportunities for self-expression and pressures to conform to aesthetic, behavioural, and normative standards shaped by peer culture and platform design.

While a growing body of research has examined online identity in the context of adolescents or influencers, relatively fewer studies have focused on how ordinary young adults—especially university students—perceive and manage their online selves across different platforms. This is particularly important as students today navigate a complex digital environment shaped by algorithmic visibility, performative norms, and fragmented audiences. Existing studies tend to treat identity as fixed or strategic, without sufficiently exploring how young people reflexively engage with questions of authenticity, audience, and self-awareness in everyday digital life.

Furthermore, in many educational or regional contexts, there is limited empirical data on how students internalize social expectations online, or how they experience the emotional labour of identity construction in social media environments. In particular, non-Western perspectives and underrepresented educational settings are often overlooked in favour of broader, generalized models of digital behaviour. This creates a gap in understanding how context-specific factors, such as cultural norms, institutional expectations, and peer

interactions influence students' communicative choices and identity performances online.

This study aims to explore how university students construct and manage their identities on social media, with a particular focus on their perceptions of authenticity, audience, and impression management. By foregrounding students' own narratives, the research seeks to contribute to a more nuanced understanding of identity as a communicative process shaped by both individual agency and platform structures. In doing so, it responds to ongoing scholarly calls for deeper, context-aware studies of digital self-presentation among young adults in everyday settings.

Purpose of the Study and Research Questions

The purpose of this study is to explore how university students construct and manage their identities on social media platforms, particularly in relation to authenticity, audience awareness, and impression management. The study takes a communication-centred approach to identity, viewing self-presentation not as a static expression of personality but as an ongoing, situated process shaped by technological affordances, social expectations, and platform-specific cultures. The research seeks to understand how students consciously and unconsciously curate their online selves, how they interpret feedback from peers, and how they experience tensions between being authentic and managing impressions in digitally mediated environments.

The study focuses specifically on university students because they occupy a transitional life stage where identity formation is especially salient. Moreover, their high engagement with platforms like Instagram, TikTok, and X makes them a valuable group for investigating how digital self-presentation practices unfold in real life. By foregrounding students' own narratives, the study aims to contribute to a more grounded and nuanced understanding of identity in the context of everyday social media use.

The research questions guiding this study were developed in alignment with the theoretical framework and the study's central aim of understanding digital identity construction as a communicative process. These questions seek to explore not only

the observable patterns of self-presentation on social media but also the underlying motivations, contextual influences, and emotional dimensions involved in identity performance. They were designed to capture the complexity of how university students experience and reflect on their online selves in everyday digital environments.

1. How do university students present themselves on social media platforms (e.g., Instagram, TikTok, X)?
2. What factors influence students' decisions about what to post, share, or conceal online?
3. How do students perceive differences between their online and offline identities?
4. What role does peer feedback (likes, comments, engagement) play in shaping their self-presentation?
5. How do students negotiate the tension between authenticity and impression management in their digital lives?

Theoretical Framework

This study draws on a communication-centred theoretical framework that conceptualizes identity as an ongoing, performative process shaped by interpersonal expectations, social norms, and technological environments. The framework integrates three key perspectives: Goffman's dramaturgical approach, self-presentation theory, and affordance theory.

Dramaturgical Perspective on Identity Performance

Erving Goffman's (1959) dramaturgical approach provides a foundational lens for understanding social interaction as a performance. According to Goffman, individuals present themselves differently depending on their audience and context, managing impressions to maintain a desired image. His concepts of "front stage" and "back stage" are particularly relevant in the context of social media, where users engage in carefully curated public displays while simultaneously managing private or more spontaneous interactions.

In digital environments, the boundaries between these stages are blurred, as multiple audiences—friends, family, classmates, and strangers—often collapse into a single, undifferentiated viewership. This “context collapse” complicates students’ efforts to manage their self-presentation consistently across different platforms or posts, often resulting in selective disclosure and strategic ambiguity.

Self-Presentation Theory

Self-presentation theory (Leary & Kowalski, 1990) builds upon Goffman’s insights by emphasizing the motivations behind identity management. Individuals engage in self-presentation both strategically (to achieve specific outcomes such as approval, popularity, or belonging) and expressively (as a reflection of internal states or self-concept). This dual motivation is particularly salient for university students navigating peer expectations, social comparison, and platform norms.

Research has shown that young adults often balance the desire to appear authentic with the need to maintain a socially desirable image, especially in public-facing digital spaces. The emotional labour involved in maintaining this balance can influence not only what students choose to post but also how they interpret and internalize audience feedback (e.g., likes, comments, shares).

Affordances of Social Media Platforms

While identity work is not new, the digital context introduces unique communicative constraints and possibilities through what are known as platform affordances (Boyd, 2014; Treem & Leonardi, 2013). Affordances refer to the features that enable or limit particular forms of interaction—for example, Instagram’s emphasis on visual content, TikTok’s algorithmic amplification, or X’s character limits and public visibility.

These affordances shape how identity is performed and perceived. For instance, ephemeral features like Instagram Stories may allow for more spontaneous self-expression, while permanent posts require greater curation. The visibility and quantifiability of audience engagement (through

metrics like likes or views) also influence students’ sense of how successful or acceptable their identity performances are.

By combining these three perspectives, this study conceptualizes identity construction on social media as a communicative process that is simultaneously personal, strategic, and technologically mediated. This integrated framework supports a nuanced exploration of how university students perform, regulate, and negotiate their online selves across platforms and audiences.

Methodology

This section outlines the methodological approach adopted to explore how university students construct and manage their identities on social media. Given the study’s focus on subjective experiences, identity negotiation, and digital self-presentation, a qualitative research design was deemed most appropriate. The following subsections detail the research design, participant selection, data collection tools, and analysis procedures, as well as ethical and trustworthiness considerations that guided the research process.

Research Design

This study adopts a qualitative research design grounded in the interpretive paradigm, which emphasizes understanding how individuals make meaning of their lived experiences. Given the study’s focus on how university students reflect on and manage their identities on social media, a qualitative approach is well suited to uncover the subjective, context-dependent nature of digital self-presentation. A qualitative research design was deemed most suitable for this study because it allows for an in-depth exploration of participants’ subjective experiences and meaning-making processes within their specific sociocultural context (Creswell & Poth, 2018; Merriam & Tisdell, 2016). Qualitative inquiry is particularly appropriate when the aim is to capture the complexity, diversity, and contextual nuances of human behaviour, rather than to test predetermined hypotheses or quantify variables. This aligns with the present study’s objective of understanding how university

students construct and manage their digital identities, a process that is inherently interpretive and socially situated.

Within qualitative traditions, in-depth interviewing was selected as the primary data collection method because it facilitates rich, detailed accounts of participants' perspectives, allowing them to articulate their experiences in their own words (Kvale & Brinkmann, 2015; Seidman, 2019). In-depth interviews create a conversational space in which the researcher can probe, clarify, and follow up on emerging themes, enabling a deeper understanding of participants' communicative strategies and identity negotiations on social media. This method is especially effective for exploring phenomena that involve personal reflection, emotional nuance, and context-specific meaning-making, all of which are central to the research questions of this study.

The study employs an exploratory design, as it investigates a relatively under-researched population—university students in a non-Western context—and seeks to develop a nuanced understanding of their communicative practices in everyday digital life.

A semi-structured interview method was chosen to explore participants' perceptions, behaviours, and motivations in depth. This method allows for both structure and flexibility—enabling the researcher to address core themes while following up on unexpected or personal insights shared by participants.

Participants and Sampling

The study was conducted at a public university in Türkiye. The participants consisted of 17 students enrolled in the university's English preparatory program. The broader population for this study consisted of all undergraduate students enrolled at the university's School of Foreign Languages, which offers English preparatory programs to students from various academic disciplines. From this population, a purposeful sampling strategy was employed to select 17 students who met the inclusion criteria. Purposeful sampling was chosen because it enables the selection of information-rich

cases that provide in-depth insights into the phenomenon under investigation (Patton, 2015). English preparatory students were considered particularly suitable for this research because they represent a transitional stage in both academic and social identity development, engage actively with social media, and come from diverse departmental backgrounds, thus offering varied perspectives on digital identity construction. The sample size was determined based on the principle of achieving thematic saturation, which was reached when no substantially new themes emerged in the data (Guest, Bunce, & Johnson, 2006). A purposeful sampling strategy was employed to select participants who met the following criteria:

- Regular use of at least one social media platform (Instagram, TikTok, or X)
- Willingness and ability to reflect on their digital self-presentation experiences
- Variation in gender to support diversity within the sample

Although all participants were enrolled in the same preparatory language program, they came from different academic departments and disciplines, as the program serves students from across the university. This provided a degree of heterogeneity in terms of academic background and future study paths, while maintaining a shared educational context for digital media use.

Data Collection

Data were collected via semi-structured, one-on-one interviews conducted in person. Each interview lasted 15–20 minutes. The interview protocol included open-ended questions exploring students' platform preferences, self-presentation choices, perceptions of audience, peer feedback, and their views on authenticity and identity consistency across platforms. The guide was developed in alignment with the study's theoretical framework and refined through a pilot test with two participants. All interviews were audio-recorded with participant consent and transcribed verbatim for analysis. Field notes were taken to capture nonverbal cues and contextual details.

Data Analysis

The data were analysed using thematic analysis (Braun & Clarke, 2006), which facilitates the identification of recurring patterns, meanings, and categories across participants' narratives. The analysis proceeded through the following steps:

1. Familiarization with the data
2. Generation of initial codes
3. Searching for themes
4. Reviewing and refining themes
5. Defining and naming final themes
6. Writing the analytic narrative

Coding was conducted manually and supported by qualitative data analysis software (NVivo). The analysis followed an inductive approach, allowing themes to emerge from the data, while being informed by theoretical concepts, such as self-presentation, audience management, and platform affordances. To strengthen analytic rigor, a second researcher independently coded a subset of transcripts to check for consistency. Discrepancies were resolved through discussion.

One notable methodological limitation of this study is the relatively short interview duration (15–20 minutes), which may have constrained the depth and richness of participants' narratives. Shorter interview formats, while sometimes necessary in applied research contexts, can reduce opportunities for extended probing, follow-up questions, and deeper exploration of emergent topics (Yin, 2018; Kvale & Brinkmann, 2015). In this study, the time constraint was primarily shaped by participants' demanding academic schedules, which limited their availability. While this limitation might have narrowed the scope of individual accounts, recurring patterns and themes emerged consistently across interviews, suggesting that the essential aspects of digital identity construction were nevertheless adequately captured.

Trustworthiness

Following Lincoln and Guba's (1985) criteria for qualitative rigor, the study ensured:

- Credibility through member checking (participants reviewed their transcripts and summaries of findings)

- Transferability through thick description of the research context and participants
- Dependability by maintaining an audit trail of decisions during data collection and analysis
- Confirmability through researcher reflexivity and documentation of potential biases

Ethical Considerations

This research was reviewed and approved by the Ethics Committee of Bilecik Şeyh Edebali University. Ethical approval was granted on May 8, 2025. The interviews were conducted between 12 and 16 May 2025, following the approval of the Ethics Committee. All participants were informed about the voluntary nature of their involvement, and informed consent was obtained prior to data collection. Anonymity and confidentiality were maintained throughout the research process.

Findings

This section presents the thematic findings of the study based on students' narrative responses regarding their identity construction practices on social media platforms. The data were analysed using Braun and Clarke's (2006) six-phase thematic analysis method, which enabled the identification of recurring patterns and meaning-making strategies across participants' reflections. Based on this analysis, six key themes emerged: Selective Authenticity, Platform-Specific Self-Presentation, Audience Awareness and Context Collapse, Peer Feedback and Emotional Influence, Privacy Boundaries and Digital Control, and Tension Between Authenticity and Impression Management.

The findings are organized according to the five research questions, with each question associated with one or more of these emergent themes. Student responses are presented in translated form and anonymized for confidentiality. Each subsection begins with a brief introduction to the research question, followed by a detailed analysis of relevant themes and illustrative quotes.

To offer a clear and structured overview of the thematic analysis, the following table summarizes how each of the five research questions guided the

identification of key themes. These themes represent the recurring patterns and meaning-making strategies found in participants' narratives, reflecting the complexity of students' digital identity construction across platforms.

Table 1. Theme Summary Table

Research Question	Themes Identified
RQ1	Selective Authenticity, Platform-Specific Self-Presentation, Visual Aesthetics
RQ2	Emotional Readiness, Social Approval, Platform Norms
RQ3	Perceived Consistency, Adjustments, Strategic Self-Differentiation
RQ4	Emotional Reinforcement, Selective Influence, Comparison
RQ5	Tension Between Authenticity and Impression Management

Digital Self-Presentation Practices

The first research question explores how university students present themselves on social media platforms. It aims to uncover the strategies, preferences, and patterns students follow when engaging in digital self-presentation. The data reveal that self-presentation is not merely about spontaneous sharing but a carefully negotiated process that balances authenticity, visual appeal, and platform-specific expectations.

Theme 1: Selective Authenticity

Participants often emphasized that they post content only when they feel confident or when the post aligns with how they want to be perceived. This results in a selective, curated version of authenticity-what might be called "the best version of the real self."

"I only share when I like how I look. Otherwise, I just scroll."

This illustrates how participants' posting decisions are closely tied to self-esteem and visual self-evaluation, reflecting a deliberate form of selective authenticity in which content is filtered based on confidence and self-image.

"Sometimes when I look at my own photo for too long, I start thinking my mouth and eyes look weird. Then I delete it."

This quote reveals a process of digital self-surveillance, where prolonged exposure to one's own image leads to heightened sensitivity and self-doubt, prompting content removal.

Theme 2: Platform-Specific Self-Presentation

Students differentiate how they present themselves depending on the platform. Instagram is often used for formal or curated posts, while TikTok allows more humour or casual content. Anonymity, pseudonyms, or private profiles are also common strategies to manage different audiences.

"On Instagram, I use my real name and photo, but on other platforms, I have a nickname."

This response shows how students use strategic identity segmentation across platforms to control visibility and manage different audiences.

"I avoid posting political content to prevent polarization. I feel more comfortable expressing myself in real life."

Here, the participant highlights a conscious boundary between personal beliefs and public exposure online, driven by concerns about potential conflict and audience interpretation.

Theme 3: Visual Aesthetics as Identity Performance

Aesthetics play a central role in digital self-presentation. Many students assess the visual quality of their posts-especially photos-before deciding to share, taking into account composition, lighting, and even peer approval.

"I always check if the photo looks aesthetic enough."

This underscores the importance of visual appeal in digital self-presentation, where aesthetic evaluation becomes a key criterion for deciding what to share.

"Before posting a group photo, I also ask if my friends look okay in it. Their approval matters too."

The participant's concern with peer approval suggests that self-presentation is not solely individualistic, but shaped by collective image management within social circles. This statement indicates that self-presentation is shaped not only by

individual judgment but also by social considerations.

Motivations and Constraints in Sharing Decisions

The second research question investigates what factors influence students' decisions about what to post, share, or conceal on social media. The findings suggest that students' sharing behaviours are shaped by a variety of personal, social, and contextual concerns—including audience awareness, emotional vulnerability, and perceived norms. Rather than engaging in spontaneous or unfiltered sharing, students often describe a deliberate and reflective process of deciding what to show and what to hide.

Theme 1: Emotional Readiness and Self-Perception

Participants often stated that they only share posts when they are in a good mood or feel positively about their appearance. Emotional self-assessment plays a crucial role in filtering what gets posted.

"If I feel confident in the photo, I might post it. If not, I just keep scrolling."

This highlights how emotional readiness and positive self-perception function as internal gatekeepers, determining whether a post is deemed shareable. Emotional comfort and self-image are strong determinants of posting behaviour.

"I deleted it because after looking at it too long, I didn't think I looked good anymore."

This quote illustrates how self-perception can shift negatively over time, revealing the unstable nature of self-image in digital spaces. It reflects internal doubts and the instability of self-perception in digital spaces.

Theme 2: Social Approval and Peer Influence

Some students noted that they consider the opinions or presence of others before posting, especially when the content includes friends or touches on shared experiences.

"If my friends are in the picture, I ask them if they're okay with it before I post."

This reflects a relational sensitivity, where social approval and mutual consent are integral to the act of posting shared experiences. It demonstrates the importance of relational sensitivity and shared identity control.

"Sometimes I post for people to see what they've lost-like my ex."

This candid statement indicates that self-presentation can serve a purposeful, even performative function in interpersonal narratives, including attempts at emotional signalling or impression formation. It shows intentional impression management aimed at specific individuals.

Theme 3: Norms of Appropriateness and Platform Expectations

Students are aware of what is considered acceptable or risky on different platforms. Many reported avoiding content that might be perceived as inappropriate, political, or too personal.

"I avoid posting anything political. I don't want to cause conflict."

This reveals a form of self-censorship, where content is filtered not only for personal preference but in anticipation of audience reaction and digital norms.

"I don't share anything that I think might be too personal or emotional."

Such remarks suggest that emotional boundaries are actively monitored, reinforcing the idea that digital sharing is both selective and context-dependent.

Online vs. Offline Identity

The third research question explores how students perceive differences between their online and offline identities. This section examines whether students experience continuity or divergence between their digital personas and their real-life selves. While some participants emphasized consistency, others acknowledged subtle or strategic changes in behaviour, tone, or visibility. The data suggest that digital platforms both mirror and reshape aspects of personal identity, often in response to contextual pressures and imagined audiences.

Theme 1: Perceived Consistency Between Selves

A significant number of students claimed that there was little or no difference between how they present themselves online and how they behave in real life, especially when their followers are limited to close friends or family.

"I'm the same person online and offline. There's no reason to act differently when only friends and family follow me."

This response suggests that a smaller, more familiar audience reduces performative pressure, supporting a sense of continuity between digital and real-life identities. It emphasizes continuity and a lack of performative pressure in smaller social circles.

"I share things I genuinely like, not fake smiles. That's just who I am."

This statement reinforces a commitment to personal authenticity, where online expression aligns with internal values.

Theme 2: Adjustments in Tone, Emotion, or Behaviour

Other students admitted that they behave more cautiously, distantly, or selectively online, especially in public-facing profiles. This is not always due to external pressure, but sometimes reflects personal preference or a desire for control.

"I act more reserved on social media because I can't really trust strangers online."

This demonstrates the protective stance students may adopt to safeguard privacy and emotional security in digital environments. It suggests a protective, self-monitoring approach in digital spaces.

"I'm more relaxed in real life. Online, I try to avoid saying too much, especially if teachers are following me."

Here, the participant describes a calculated self-censorship shaped by the awareness of overlapping audiences, particularly those in positions of authority. It reflects how the presence of authority figures affects self-expression.

Theme 3: Strategic Self-Differentiation Across Platforms

Some participants described using different platforms for different aspects of their identity-formal on one, humorous or anonymous on another-highlighting the compartmentalization of self.

"Instagram is my 'real' self, but on other platforms I use nicknames and post more freely."

This reflects platform-based identity compartmentalization, where students consciously adapt their self-expression based on the expected audience and affordances of each platform. It shows conscious segmentation of identity based on platform culture and audience.

"On TikTok I just try to be funny. On Instagram, it's more about looking good."

This suggests that platform-specific cultures and norms shape the way identity is performed, resulting in distinct versions of the self across digital contexts.

Peer Feedback and Emotional Influence

The fourth research question investigates what role peer feedback-such as likes, comments, and other forms of engagement-plays in shaping students' self-presentation on social media. The findings suggest that while some students downplay the importance of social validation, many report being emotionally influenced by audience reactions. The data indicate that peer feedback functions not only as affirmation but also as a regulating force that shapes posting behaviour, emotional state, and self-worth.

Theme 1: Emotional Reinforcement and Social Validation

Positive feedback from peers (likes, comments, story views) often enhances students' mood and reinforces their sharing behaviour, leading to a sense of recognition and social belonging.

"It makes me happy when my friends like or comment on what I post."

This quote highlights how digital feedback serves as emotional reinforcement, contributing to feelings of social connectedness and validation. It

reflects the emotional boost provided by digital approval.

"I feel like someone is paying attention to me-it feels good."

Even minimal engagement appears to offer students a sense of recognition and belonging, reinforcing their digital presence.

Theme 2: Minimal or Selective Influence

Some students reported being relatively unaffected by peer feedback, especially when they post content primarily for themselves rather than others. However, their language often implies subtle emotional negotiation.

"If I like what I posted, I don't care if others do or not."

Although this suggests a sense of autonomy, it also implies a subtle negotiation between internal satisfaction and external validation.

"I don't really change what I post based on people's reactions."

Here, the participant conveys resistance to external influence, though such resistance may not be absolute. The statement indicates a perceived autonomy in digital self-expression.

Theme 3: Comparison and Confidence Fluctuations

Several participants admitted comparing their posts or profiles to others, which sometimes led to decreased self-esteem or a reluctance to share further content.

"When I see better pictures from others, I feel bad about mine. It affects my confidence."

This candid reflection illustrates the emotional toll of social comparison, revealing how online interactions can undermine self-esteem. It demonstrates the emotional toll of constant social comparison in digital environments.

"I don't compare myself, but I do find it weird when people post too much."

Even when students deny direct comparison, subtle judgments about others' posting habits suggest underlying social norms and expectations. It suggests an underlying judgment tied to perceived norms around posting frequency and content type.

Authenticity vs. Impression Management

The fifth research question explores how students negotiate the tension between being authentic and managing impressions in their digital lives. The findings reveal a complex and often emotionally charged negotiation process in which students try to balance personal truthfulness with the desire to be liked, respected, or socially validated. Social media becomes a space where authenticity is both valued and strategically controlled, depending on the audience, platform, and emotional context.

Theme: Tension Between Authenticity and Impression Management

Participants described feeling a constant push and pull between wanting to present their "real selves" and needing to control how they are perceived by others. While authenticity was often described as a goal, many students admitted filtering, staging, or withholding aspects of their lives to avoid judgment or misunderstanding.

"Being real means showing who you truly are, but I still hide some parts-some things are not for everyone."

This reveals the paradox of digital authenticity, where selective disclosure becomes necessary to balance openness with personal boundaries. It reflects selective disclosure as a way to protect both personal boundaries and social image.

"I post what I want, but I make sure it's something others won't judge."

Here, impression management is embedded within acts of self-expression, reflecting a nuanced awareness of audience expectations.

"People are not really themselves. They act how others want to see them."

Such a statement reflects a critical view of online performativity, where authenticity is often compromised for social approval. It indicates that students are critically aware of performativity and the social pressures of digital environments.

"I feel like I'm funny and open on TikTok, but more careful on Instagram-it's not fake, just different sides of me."

This indicates a layered understanding of selfhood, where authenticity is multifaceted and

adapted across platforms without being disingenuous.

Discussion

This study explored how university students construct and manage their identities on social media, focusing on the interplay between authenticity, peer feedback, and impression management. The findings confirm and extend prior research in digital identity studies, especially among young adults in higher education. This section discusses the results in relation to existing literature, while highlighting new contributions and context-specific insights.

Negotiating Authenticity through Selective Self-Presentation

Participants in this study demonstrated a consistent desire to appear authentic while carefully selecting what aspects of themselves to reveal. This aligns with the concept of "curated authenticity", whereby individuals present a sincere but filtered version of the self (Bareket-Bojmel et al., 2016). Similar patterns were identified by Yau and Reich (2019), who found that adolescents and young adults often perform authenticity within the limits of aesthetic acceptability and social norms. In both studies, individuals negotiate internal desires for self-expression with external expectations of likability and appearance.

In the current study, students emphasized emotional readiness and self-confidence as key factors in their posting decisions-extending Lomborg's (2013) work on emotional labour in self-presentation. Unlike some Western-based studies that emphasize branding or strategic image crafting, participants here described authenticity as layered and relational, shaped by feelings, moods, and perceived risks of exposure in mixed audiences. Similar patterns have been identified in the Turkish context. For example, Akkaş and Aksakal (2023) found that university students in Türkiye also tend to display "selective authenticity," consciously filtering content to align with both personal and societal expectations. Their findings, consistent with

the present study, suggest that emotional readiness and perceived social risk strongly influence self-presentation decisions in online environments shaped by local cultural norms.

Platform-Specific Identity Performances and Digital Affordances

Students' use of different platforms to highlight distinct facets of identity supports previous findings on platform affordances (Treem & Leonardi, 2013; Boyd, 2014). For instance, Instagram was seen as a space for polished, aesthetic content, while TikTok allowed more humorous or spontaneous posts. These platform-specific norms parallel Siibak's (2009) findings on visual impression management, where platform design and audience expectations directly influence content selection.

Moreover, participants' strategic segmentation of identity across platforms reflects Zhao et al.'s (2008) concept of anchored relationships-where people perform different selves depending on the stability and familiarity of their audience. National research echoes these dynamics; Özdemir (2019) observed that Turkish communication students often differentiate their self-presentation strategies across platforms, maintaining a more formal persona on public-facing networks while using pseudonyms or restricted accounts for informal interactions. This parallels the present study's finding that platform affordances and audience composition directly shape identity segmentation. In this study, students were especially mindful of academic authority figures and family members as part of their digital audience, which led to cautious self-presentation in more public or permanent spaces.

Audience Awareness and the Pressure of Context Collapse

The study reinforces the concept of context collapse (Marwick & Boyd, 2011), where multiple social circles converge in one digital space, complicating audience management. Participants expressed emotional discomfort when trying to communicate with different audiences simultaneously-a tension also noted by Duffy and Hund (2019) in

their research on online visibility among students and early career professionals.

Interestingly, while some participants managed this collapse by maintaining private accounts or using pseudonyms, others adjusted tone, content, and frequency of posting. These findings point to a high level of digital reflexivity, where students are constantly evaluating what version of themselves is “safe” to show, a pattern also observed by Page and Thomas (2021) in their cross-platform study of student identity. In Türkiye, similar concerns have been documented by Ökten (2024), who reported that university students experience heightened awareness of overlapping audiences, particularly when academic staff and family members are part of their online networks. This overlap often prompts adjustments in tone, content, and visibility, consistent with the present study’s observations.

Peer Feedback as Emotional and Social Regulation

Likes, comments, and engagement metrics were consistently reported as sources of emotional reinforcement. This supports Leary and Kowalski’s (1990) model of strategic and expressive self-presentation and aligns with findings by Bazarova et al. (2017), who showed that positive feedback on social media directly impacts users’ mood and sense of social connectedness.

However, this study also found that negative or absent feedback could reduce confidence or prompt content removal-echoing the findings of Vogel et al. (2014), who demonstrated that upward social comparison in digital spaces can lead to decreased self-esteem. Comparable findings were reported by Akkaş and Aksakal (2023), who noted that Turkish university students’ engagement with social media is significantly shaped by peer approval and perceived social recognition, underscoring the universal role of validation in digital self-presentation. While students sometimes claimed to post “just for themselves,” their narratives revealed subtle dependence on external validation, especially from close peers.

Privacy Boundaries and Emotional Labour

Students described being selective about what they disclose, not only for impression management but also for emotional protection. This confirms Papacharissi’s (2010) argument that online identity performance is both public and affective, where emotional boundaries are shaped by imagined consequences and permanence.

In contrast to influencer-focused studies where content is often calculated for visibility, students here engaged in micro-boundary setting, avoiding political content or emotionally vulnerable posts. This strategic withholding mirrors findings by Tiggemann and Slater (2014), who found that young adults often experience pressure to display positivity and emotional control online. Özdemir (2019) similarly found that students deliberately avoid sharing politically sensitive or deeply personal content, reflecting a culturally specific awareness of potential reputational and relational consequences.

Balancing Authenticity and Impression Management

Perhaps the most significant contribution of this study is its nuanced account of how students negotiate the fluid tension between authenticity and impression management. Rather than viewing these as opposing forces, participants framed authenticity as contextual and multifaceted- “being real” while remaining socially appropriate. This perspective supports Papacharissi’s (2010) notion of hybrid identity, in which online selves are both aspirational and grounded in lived experience.

Whereas previous studies (Marwick, 2013) often portrayed digital performance as highly strategic, the participants of this study described self-presentation as emotionally reflexive and responsive to shifting platform cultures and personal life stages. This suggests that identity construction is not merely performance but a dynamic form of emotional and communicative labour, continuously negotiated through trial, feedback, and self-correction. National-level evidence aligns with this perspective. Ökten (2024) highlighted that Turkish

students often perceive authenticity as a multifaceted construct, balancing self-expression with adherence to social expectations rooted in local cultural contexts, thereby reinforcing the present study's conceptualization of authenticity as both relational and strategic.

Conclusion

This study investigated how university students construct and manage their identities on social media, with a particular focus on authenticity, impression management, peer feedback, and platform-specific behaviours. Drawing on qualitative data from student narratives, the analysis revealed a complex digital environment in which identity is both strategically performed and personally negotiated. The findings highlight that while students value authenticity, their digital self-presentation is often shaped by social expectations, emotional readiness, and the affordances of different platforms.

One of the key contributions of this study is its demonstration of "selective authenticity" as a dominant mode of self-presentation, where students attempt to stay true to themselves while still curating content to meet aesthetic and social norms. The research also underscores how peer engagement—such as likes and comments—functions not merely as feedback but as a regulatory mechanism that can affirm or undermine confidence. Additionally, students' awareness of context collapse and their strategies for managing multiple audiences reflect a high level of digital literacy and emotional labour in maintaining their online identities.

Theoretically, the study extends Goffman's dramaturgical framework and self-presentation theory by illustrating how identity is shaped within the constraints and possibilities offered by social media technologies. It also adds empirical depth to the concept of digital reflexivity by showing how students continuously evaluate and adjust their online presence in response to imagined and real audiences.

Limitations and Suggestions for Future Research

While this study provides valuable insights into how university students construct and negotiate their identities on social media, several limitations should be acknowledged. First, the sample was drawn from a single public university in Türkiye, which may limit the generalizability of the findings to other cultural or institutional contexts. Experiences of digital self-presentation can vary significantly based on regional, socio-economic, and educational differences.

Second, although the research focused primarily on Instagram, TikTok, and X, participants also mentioned other platforms, such as YouTube, WhatsApp, and Kick. These platforms were not included in the primary analysis. Future studies could benefit from examining a broader platform ecology to better understand cross-platform identity management.

Additionally, comparative research across multiple universities or national contexts could shed light on how cultural values, institutional norms, and platform algorithms shape digital identity practices. Integrating intersectional factors, such as gender, sexuality, or migration background may also deepen the understanding of how social identities are performed and negotiated in digitally mediated spaces.

Moreover, future research could explore how the transition from student to professional life impacts digital self-presentation, particularly as students begin to reposition their online personas for employability, reputation management, or civic engagement. Longitudinal studies would also be valuable in tracking how students' digital identities evolve over time in response to platform changes, life events, or shifting social expectations.

Future research could extend these findings by employing larger and more diverse samples drawn from multiple universities, allowing for cross-institutional and cross-cultural comparisons. Conducting longer, in-depth interviews would help uncover more nuanced dimensions of digital identity construction. Comparative studies across different social media platforms, as well as longitudinal research tracking students' self-presenta-

tion strategies during the transition from university to professional life, could yield valuable insights into the evolving nature of digital identity management.

In sum, social media functions as both a mirror and a stage for young adults navigating identity in the digital age. Exploring the communicative choices underlying online self-presentation can offer rich insights into the broader social, emotional, and cultural landscapes shaping youth identity today.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *This research was approved by the Ethics Committee of Bilecik Şeyh Edebali University on May 8, 2025.*

Informed Consent: *Informed consent was obtained from all participants prior to data collection.*

Data Availability: *The interview transcripts and related datasets are available from the corresponding author on reasonable request.*

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RESEARCH ARTICLE

Mapping the Intersection of Financial Literacy, Halal Awareness, and Islamic Finance: A Bibliometric Review from Web of Science

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Abstract

This study aims to conduct a comprehensive bibliometric analysis of academic research on financial literacy, halal literacy, and Islamic finance using data extracted from the Web of Science (WoS) database. A total of 2,474 articles were analyzed through bibliometric methods utilizing the Biblioshiny R-package and VOSviewer software. The analysis explores publication trends, key authors, thematic clusters, and collaborative networks in these intersecting fields. Beyond its academic scope, this study addresses a real-world gap that affects the financial well-being of individuals striving to align their financial decisions with Islamic principles. For example, a tradesperson may wish to expand their business through halal financing but lacks sufficient knowledge of Islamic financial instruments. Similarly, a housewife may intend to invest for her family's future in a Shari'ah-compliant manner but is unsure where to begin. While this study does not evaluate audience engagement directly, bibliometric findings suggest that themes related to halal awareness and Islamic financial literacy are underrepresented in the current academic discourse. Furthermore, even in countries like Türkiye, where financial literacy stands at only 23,6% (FODER, 2023), the lack of accessible academic dissemination further limits the potential impact of scholarly work on public financial behavior. Therefore, this study not only contributes to the academic mapping of the field but also seeks to inform financial institutions, educators, and policy makers in designing more inclusive and targeted strategies. By revealing patterns, gaps, and emerging trends, the study aims to bridge the disconnect between academic research and practical financial needs in Muslim-majority societies.

Keywords: Financial Literacy, Helal Literacy, Bibliometric Analysis, Islamic Finance, Finance

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Öz

Bu çalışma, finansal okuryazarlık, helal okuryazarlık ve İslami finans alanlarında yapılan akademik yayınları Web of Science (WoS) veri tabanı üzerinden analiz etmeyi amaçlamaktadır. Çalışma kapsamında toplam 2,474 makale değerlendirilmiştir; analiz sürecinde Biblioshiny R paketi ve VOSviewer yazılımı kullanılarak bibliyometrik yöntemler uygulanmıştır. Yayın eğilimleri, öncü yazarlar, tematik kümelemeler ve iş birliği ağları gibi birçok boyutta alan yazına ilişkin kapsamlı bir haritalama sunulmaktadır. Bu konular yalnızca akademik ilgi alanları olmanın ötesinde, bireylerin hayatlarını doğrudan etkileyen pratik öneme sahiptir. Örneğin, helal yollarla işini büyütmek isteyen bir esnaf, İslami finans araçları hakkında yeterli bilgiye sahip olmadığında uygun çözümlere ulaşamayabilir. Ya da ailesinin geleceği için İslami ilkelere uygun yatırım yapmak isteyen bir ev hanımı, nereden başlayacağını bilemeyebilir. Bu çalışma doğrudan hedef kitleye ulaşım düzeyini değerlendirmese de, bibliyometrik bulgular helal farkındalığı ve İslami finansal okuryazarlık temalarının mevcut akademik literatürde yeterince temsil edilmediğini göstermektedir. Nitekim, yalnızca Türkiye özelinde değerlendirildiğinde bile finansal okuryazarlık oranının %23,6 seviyesinde olması (FODER, 2023), ilgili grupların akademik bilgidan faydalanma olanaklarını ciddi biçimde kısıtlamaktadır. Bu bağlamda, çalışmanın yalnızca akademik çevreler için değil; finansal kurumlar, eğitimciler ve politika yapımcılar için de yol gösterici nitelikte anlamlı katkılar sunması beklenmektedir. Alandaki eğilimleri, boşlukları ve gelişen temaları ortaya koyarak, akademik bilgi ile toplumun reel ihtiyaçları arasındaki boşluğu doldurmayı amaçlamaktadır.

Anahtar Kelimeler: Finansal Okuryazarlık, Helal Okuryazarlık, Bibliometrik Analiz, İslami Finans, Finans

Introduction

In recent years, financial literacy has garnered global attention as a foundational skill for economic empowerment, individual well-being, and inclusive financial development. The ability to understand, evaluate, and act upon financial information is now widely recognized not only as a matter of personal responsibility but as a structural determinant of economic participation and social mobility. Yet, for individuals in Muslim-majority societies or those seeking to conduct their financial lives in accordance with Islamic principles, conventional definitions of financial literacy fall short. In such contexts, financial literacy must be understood in tandem with halal literacy—the capacity to distinguish between permissible and impermissible financial practices under Shari’ah law—and Islamic financial literacy, which encompasses awareness of instruments like murabaha, sukuk, mudarabah, and takaful. While Islamic finance as an industry has matured and diversified across jurisdictions, the scholarly literature has rarely treated financial literacy, halal literacy, and Islamic finance as interconnected domains. Most research continues to examine them in isolation: studies on financial literacy often lack cultural or religious specificity (Atkinson & Messy, 2012), while analyses of Islamic finance focus on institutional structures, regulatory models, or product innovation, leaving consumer understanding and education largely unexamined (Asmani et al., 2020; Bhutto et al., 2023; Sönmez, 2025). This gap is particularly evident in the case of halal literacy, a concept frequently referenced in regulatory or marketing discussions but insufficiently developed in academic discourse. This study addresses this critical gap by conducting a comprehensive bibliometric analysis of academic publications on financial literacy, halal literacy, and Islamic finance. Drawing on a dataset of 2,474 articles retrieved from the Web of Science database, the study employs Biblioshiny and VOSviewer to map thematic trends, scholarly collaborations, and intellectual structures across these fields. By focusing not only on the volume but also the conceptual intersections and knowledge gaps within the literature, this research offers an origi-

nal contribution to the evolving discourse on financial literacy in ethical and religious financial contexts.

Importantly, the relevance of this inquiry extends beyond the academy. Consider, for instance, an entrepreneur who wishes to finance business growth through halal means but lacks sufficient understanding of Islamic financing mechanisms. Or a housewife who intends to invest in a Shari’ah-compliant way for her family’s future but is unsure how to assess financial options. Without access to digestible, relevant, and ethically aligned financial knowledge, these individuals remain marginalized from formal financial systems. This situation is exacerbated by the low levels of financial literacy in many Muslim-majority countries. In Turkey, for example, only 23,6% of the population over the age of 18 is considered financially literate (FODER, 2015; Klapper et al., 2015), a statistic that severely limits the ability of individuals to engage with even basic financial instruments, let alone those tailored to Islamic norms. (Grohmann et al., 2018) underscore that financial literacy is not merely a private good but a public asset with implications for financial inclusion, macroeconomic stability, and social welfare. Their cross-country evidence shows that financial literacy positively affects both access to and use of financial services, particularly when combined with enabling infrastructure. However, they also argue that literacy alone is insufficient; institutional contexts, education systems, and cultural norms shape how knowledge translates into behavior. This study draws inspiration from such work but extends it by placing halal literacy and Islamic finance at the center of the analysis, thus bringing a culturally embedded and ethically responsive perspective to the financial inclusion discourse. Ultimately, this research aspires to guide not only the academic community but also financial institutions, educators, and policymakers in designing inclusive and Shari’ah-aligned literacy interventions. In doing so, it aims to bridge the enduring disconnect between academic output and the lived realities of financially underserved populations in the Islamic world.

Literature Review: Financial Literacy and Islamic Finance

Financial literacy, broadly defined as the ability to understand and effectively manage financial matters, has become a critical skill in modern economies. In Islamic contexts, this literacy is more complex, incorporating ethical, legal, and religious dimensions rooted in Shari'ah principles. As Islamic finance expands globally, a distinct form of Islamic financial literacy has emerged, emphasizing concepts such as prohibition of *riba* (interest), risk-sharing, and compliance with halal economic activities. Asmani et al., (2019) highlight that while consumer demand supports greater integration between the halal industry and Islamic finance in Malaysia, institutional frameworks have not kept pace. They emphasize the need for financial literacy, religious education, and halal awareness to empower consumers and increase trust in the Islamic financial ecosystem.

Several studies demonstrate that financial literacy—especially when infused with Islamic values—has a measurable impact on consumer behavior. Bhutto et al., (2023) examined the purchasing behavior of young Muslim consumers toward halal cosmetics and found that halal literacy significantly enhanced their ethical decision-making. This finding affirms that domain-specific literacy increases both intention and trust in Islamic financial products. Similarly, Pambekti & Lestari, (2024) reveal that green lending by Islamic rural banks only achieves productivity gains when recipients possess sufficient financial literacy. In these contexts, financial knowledge helps consumers understand and use Islamic instruments more effectively—whether in agriculture, SMEs, or halal-certified businesses.

The development of Islamic financial literacy policies (IFLPs) has gained momentum. Jouti, (2021) argues that effective literacy programs must incorporate the religious, cultural, and terminological characteristics of Islamic finance. This goes beyond teaching basic financial skills—it requires familiarity with Arabic legal terms, zakat systems, risk-sharing contracts like *mudarabah*, and halal investment mechanisms. From an educational

standpoint, conventional studies also support literacy's long-term value. Gerrans & Heaney, (2019) found that university-level financial education enhances knowledge and confidence, even if behavioral impacts diminish over time. Wilson et al., (2014) also stress that financial literacy must move beyond numeracy to include critical thinking, a point especially relevant to Islamic educators aiming to instill ethical financial decision-making.

Measuring financial literacy remains a challenge, particularly when behavioral outcomes deviate from rational expectations. Kawamura et al., (2021) discovered that individuals with high financial literacy may paradoxically engage in overconfident or risky behaviors. Zhu, (2021) reached a similar conclusion with adolescents, emphasizing the mismatch between perceived and actual knowledge. This risk is amplified in Islamic finance, where the misuse or misinterpretation of products—such as *murabaha*, *ijara*, or *takaful*—can undermine both financial outcomes and Shari'ah compliance. Hence, financial literacy measurement in Islamic settings must also capture behavioral attitudes and comprehension of religiously mandated practices.

The rise of digital finance has reshaped the landscape of Islamic finance. Choung et al., (2023) argue that digital financial literacy, the ability to navigate and safeguard online financial activities—has become a key determinant of financial well-being. This is especially critical in Islamic fintech, where mobile banking, crowdfunding, and smart contracts are now prominent. Jones et al., (2024) explored how crypto literacy complements general financial knowledge, suggesting that digital asset awareness enhances financial decisions. As Islamic finance ventures into halal cryptocurrencies and blockchain-based smart *sukuk*, digital literacy must evolve alongside traditional Islamic knowledge frameworks.

A central goal of Islamic finance is financial inclusion—providing access to ethical financial services for all, especially the poor. Grohmann et al., (2018) demonstrate that financial literacy improves inclusion outcomes across countries. Gyori, (2021) focuses on Hungary, where tailored programs for the poor show that financial literacy is not only a

tool for knowledge but a pathway to empowerment. In the Islamic context, financial inclusion is inherently tied to justice (adl) and avoiding exploitation. However, low levels of literacy and lack of awareness about Islamic banking options often leave marginalized communities reliant on informal or interest-based systems. Ameer & Khan, (2020) affirm that gender, financial education, and upbringing influence financial confidence and behavior.

Trust plays a central role in Islamic finance. Fisch & Seligman, (2022) show that both trust and literacy predict financial market participation. However, as Kramer, (2016) warns, individuals confident in their literacy are often less likely to seek professional advice, potentially increasing their exposure to missteps. This phenomenon is particularly critical in Islamic finance, where contract complexity (e.g., bay al-salam, musharakah) can require professional interpretation. Sabri & Aw, (2019) further stress the importance of credible information sources. Their Malaysian study reveals that users of internet and professional advisory sources demonstrate higher financial literacy, while those relying on family or media perform worse. For Islamic finance to build broader trust, accessible and certified advisory channels are essential.

Sönmez (2025) presents a bibliometric analysis of 547 publications on Islamic financial institutions from 2002 to 2024, highlighting key trends and research gaps. The study shows that the literature is largely concentrated in business finance, economics, and management, with Malaysia and the International Islamic University Malaysia emerging as dominant contributors. Influential authors include Rihab Grassa and M. Kabir Hassan, while core keywords such as “Islamic finance” and “Islamic banking” define the field. The findings underscore the growing global relevance of Islamic finance and suggest the need for more interdisciplinary and applied research to deepen the literature. Bayram et al. (2022) conducted a survey among 100 employees of both private and state-owned participation banks in Türkiye to assess their knowledge of Islamic financial products and financing methods. Despite Türkiye’s predominantly Muslim

population, the study highlights that Islamic banking assets constitute only 7% of total banking assets. The results revealed a moderate level of awareness, with an average accuracy rate of just 54% on 20 knowledge-based questions. These findings underscore a significant gap in Islamic financial literacy, even among professionals working in the sector, and point to the need for more targeted education and training initiatives. On the other hand, equity crowdfunding has emerged as an alternative financing mechanism that aligns with the principles of transparency, participation, and ethical investment—core concerns in Islamic financial discourse. A bibliometric analysis by Güçlü and Canbaz (2024) reveals growing academic interest in this field between 2013 and 2024, with research concentrated in entrepreneurship and finance journals. Key themes include human capital, lead investors, innovation, trust, and signaling theory. The study identifies Vismara as the most cited author and highlights the prominence of Italian universities and European institutions in the literature.

Islamic financial literacy emerges in the literature as a distinct and critical domain, not simply an extension of conventional financial literacy. It includes an ethical, behavioral, religious, and increasingly digital dimension. Studies confirm that higher literacy leads to improved behavior, trust, inclusion, and institutional confidence—but also caution that literacy alone does not prevent poor decisions if not embedded within a comprehensive ethical and practical framework. As Islamic finance evolves into a more complex and digitized system, future research and policy must address how to systematically educate diverse populations—students, rural workers, women, and youth—not only in financial skills, but also in how those skills are shaped by and contribute to an Islamic ethical economy.

Methodology

This study adopts a bibliometric analysis approach to systematically map and evaluate the academic literature on financial literacy, halal literacy, and Islamic finance. Bibliometric methods are widely

used to assess the intellectual, social, and conceptual structure of a research field, offering a data-driven approach to synthesize large volumes of academic output (Ingale & Paluri, 2022; Pranajaya et al., 2024).

Data Collection

The dataset for this study was retrieved from the Web of Science (WoS) Core Collection, one of the most reputable academic databases used in bibliometric research due to its rigorous indexing standards and comprehensive metadata. Using a refined query that included the keywords "financial literacy" (Topic) or "halal literacy" (Topic) and "Islamic finance" (Topic) and Business or Business Finance or Economics (Web of Science Categories) and English (Languages) and Article (Document Types), a total of 2,474 articles were identified as relevant for analysis. The search was limited to peer-reviewed journal articles published up to March 2024, across all subject areas, languages, and countries to ensure comprehensiveness.

Tools and Software

Following best practices in bibliometric analysis (Afjal, 2023; Yadav & Banerji, 2023), two specialized software tools were employed:

1. Biblioshiny, a web-based interface for the R-based Bibliometrix package (Pranajaya et al., 2024), was used for descriptive bibliometric analysis (e.g., most productive authors, institutions, countries), citation analysis, and keyword evolution.
2. VOSviewer, a network visualization tool developed by (Devender et al., 2025), was used to create visual maps of co-authorship networks, co-citation clusters, and keyword co-occurrence.

These tools allowed the study to uncover the intellectual structure of the field, detect emerging themes, and assess patterns of collaboration.

Scope and Limitations

While the Web of Science database offers structured, high-quality metadata, its scope may exclude valuable publications from regional databases or non-indexed journals, particularly in the Islamic world. Furthermore, bibliometric techniques capture publication and citation patterns but do not assess the quality or depth of content. As noted by Sundarassen et al., (2023), future research could complement this study with a systematic literature review or meta-analysis for deeper conceptual insights. Despite these limitations, the methodological rigor and scale of this study ensure that it contributes a comprehensive, transparent, and replicable assessment of the intersection between financial literacy, halal awareness, and Islamic financial systems.

Findings

Data Set Used in the Study

Table 1. Dataset General Information

Description	Results
Main information about data	
Timespan	2001:2025
Sources (journals, books, etc)	543
Documents	2474
Annual growth rate %	25,03
Document average age	4,63
Average citations per doc	19,53
References	79924
Document contents	
Keywords plus (id)	2236
Author's keywords (de)	5197
Authors	
Authors	5248
Authors of single-authored docs	326
Authors collaboration	
Single-authored docs	378
Co-authors per doc	2,88
International co-authorships %	25,87

According to Table 1, bibliometric analysis was conducted on a dataset comprising 2,474 documents published between 2001 and 2025, retrieved from 543 different sources including journals, conference proceedings, and edited volumes. The field has exhibited a robust annual growth rate of 25.03%, indicating increasing scholarly interest

over the years. On average, each document received 19.53 citations, suggesting moderate academic impact across the dataset.

The literature spans a wide thematic range, as reflected in 5,197 author keywords and 2,236 Key-words Plus entries. The data includes 5,248 unique authors, among which 326 contributed single-authored publications. The average number of co-authors per document is 2.88, and the international collaboration rate stands at 25.87%, pointing to a healthy level of global scholarly interaction in this research domain.

The Change in the Number of Article on an Annual Basis

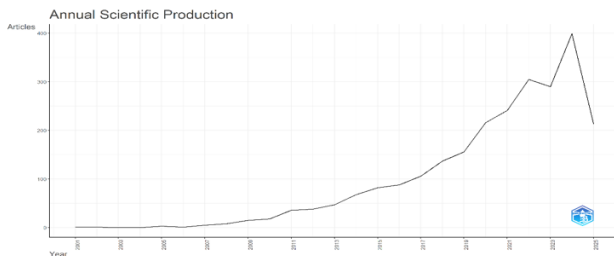


Figure 1. Number of Articles Annual Change

As illustrated in Figure 1, the scientific output on financial literacy, halal literacy, and Islamic finance has shown a steady and accelerating upward trend from 2001 to 2023. The number of publications grew modestly in the early 2000s, followed by a sharp increase beginning around 2016. The peak was observed in 2023, with over 400 publications, reflecting heightened academic interest in the field. Although there is a visible decline in 2024, this is likely due to incomplete indexing of publications for the most recent year.

A Three-Field Analysis Visualizing the Interactions Between Authors' Countries, Leading Authors, Author Keywords and Published Journals

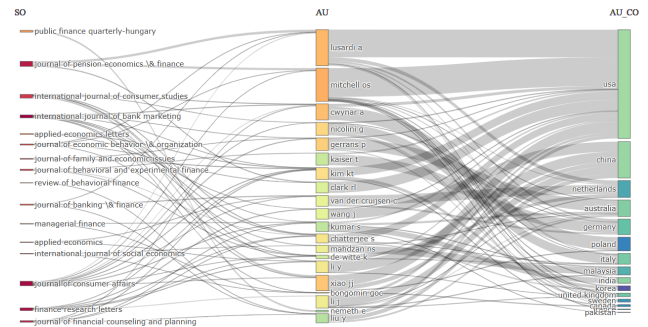
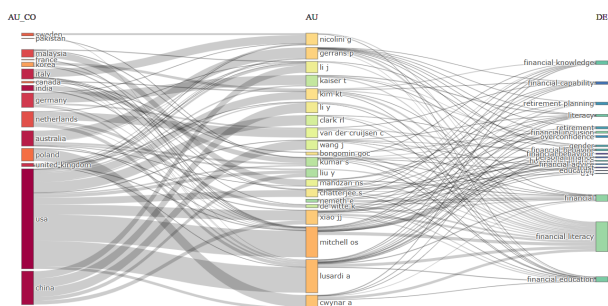


Figure 2. Three-Fields-Plot

The figure 2 presents that author from countries such as the United States, China, Australia, the Netherlands, and Germany stand out with their work published in internationally renowned journals in the relevant field. For example, while American researchers tend to publish in journals such as the Journal of Pension Economics and Finance Research Letters, Chinese authors tend to publish in banking and finance and consumer-oriented journals. Additionally, leading authors such as Lusardi A and Mitchell OS stand out for their contributions to this field, particularly in the concept of financial literacy, and present studies that shape the research area. This analysis, which reveals the connections between countries, authors, key concepts, and academic journals, provides a valuable tool for understanding the general trends in international collaboration and academic productivity in this field.

Top Publishing Journals

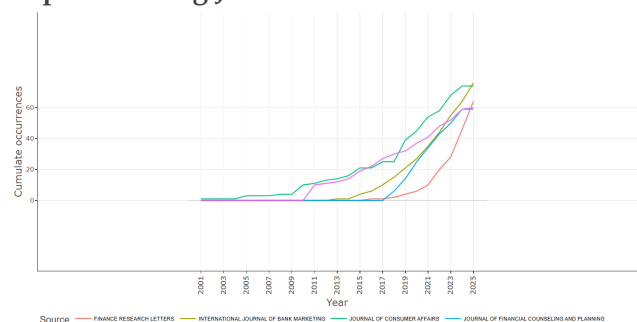


Figure 3. Production Over Time

International Journal of Bank Marketing; this journal lagged behind in terms of publication numbers until 2013 but has since recorded steady growth, particularly in recent years. Journal of Consumer Affairs; this journal has shown continuous growth during the relevant periods. Finance

Research Letters; this journal has shown a notable increase in the number of publications in the relevant field after 2020. Journal of Pension Economics & Finance; this journal has shown an upward trend in the number of publications, especially since 2010. Journal of Financial Counseling and Planning; the number of publications began to increase in 2018 and has shown steady growth in recent years. Overall, an upward trend in the number of publications is observed across all journals. This indicates an increase in academic interest in the relevant field.

Most Relevant Sources

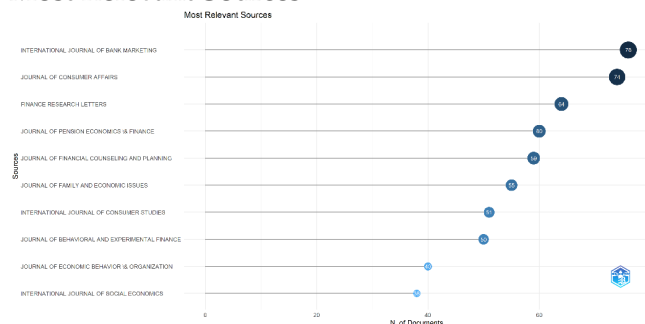


Figure 4. Most Relevant Sources

In terms of total number of publications, the “International Journal of Bank Marketing” is the most prolific source with 76 articles, followed by the “Journal of Consumer Affairs” (74 articles), “Finance Research Letters” (64 articles), “Journal of Pension Economics & Finance” (60 articles), and “Journal of Financial Counseling and Planning” (59 articles).

Top 10 Ranking Authors with the Highest Number of Article

According to the data in Figure 5, Mitchell OS stands out as the most prolific author with 34 articles, while Lusardi A ranks second with 31 articles. Authors such as Cwynar A, Xiao JJ, Gerrans P, Nicolini G, Kim KT, Bongomin GOC, Chatterjee S, and Li Y have also made significant contributions to the field with between 11 and 15 articles.

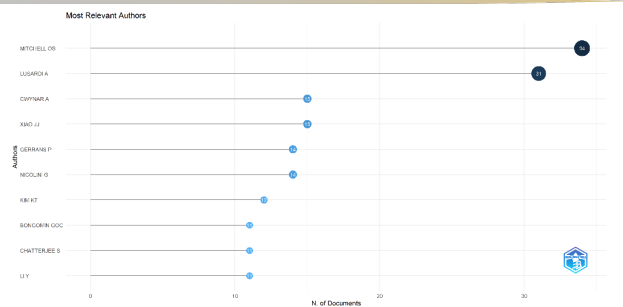


Figure 5. Authors With The Most Publications

Authors' Production over Time

According to Figure 6, Lusardi A and Mitchell OS achieved high publication counts and citation rates in 2011, 2014, and 2017, Xiao JJ demonstrated a significant increase in productivity in 2017 and 2020, while other authors showed concentrated activity in specific years but generally maintained a more balanced publication performance.

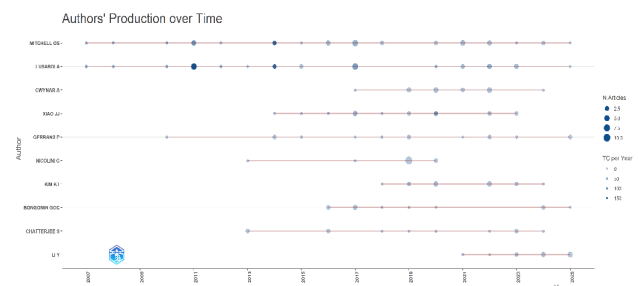


Figure 6. Authors' Publication Performance Over Time

Corresponding Author's Countries

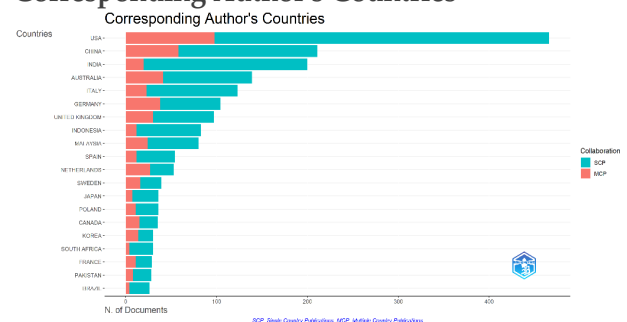


Figure 7. Number of Publications by Countries of Responsible Authors

The United States (US) is the country that publishes the most articles, followed by China and India. The fact that the US has high numbers in both single-country publications (SCP) and multi-country publications (MCP) indicate that the country's domestic research is also strong, despite international collaborations. Although not included in the

relevant figure countries such as Lebanon, Luxembourg, Yemen, Argentina, Montenegro, Mozambique, Namibia, Nicaragua, and Zimbabwe have high MCP ratios, indicating that their research outputs are largely dependent on international collaborations.

Most Cited Countries

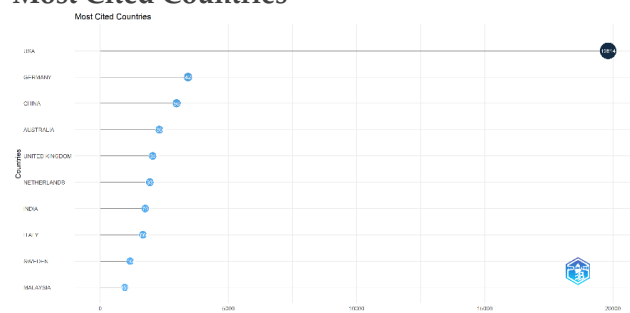


Figure 8. Countries by Total Number of Citation

The top ten countries with the highest total number of citations are the United States (19,814), Germany (3,248), China (2,981), Australia (2,306), the United Kingdom (2,045), the Netherlands (1,933), India (1,751), Italy (1,666), Sweden (1,166), and Malaysia (956), while Turkey (ranked 27th) lags far behind with a total of 242 citations; this indicates that the impact of research in Türkiye is lower than that of countries with the highest number of citations.

Most Global Cited Documents

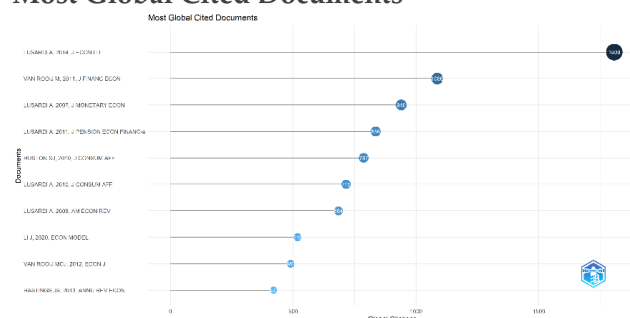


Figure 9. Most Cited Articles and Citation Numbers

Lusardi A's article "The Economic Importance of Financial Literacy: Theory and Evidence", published in the Journal of Economic Literature in 2014 (Lusardi & Mitchell, 2014), is the most cited study with a total of 1,808 citations and an average of 150.67 citations per year. It is followed by Van Rooij M's article (van Rooij et al., 2011) titled "Financial literacy and stock market participation",

published in the Journal of Financial Economics in 2011 (1,086 total citations, 72.40 average per year) and Lusardi A's article (Lusardi & Mitchell, 2007) titled "Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth" published in the Journal of Monetary Economics (940 total citations, 49.47 annual average). These top three articles demonstrate the significant impact and widespread reference of studies on financial literacy and economic behavior.

Most Frequent Words



Figure 10. Word Cloud

Based on Figure 10, financial literacy and financial concepts emerge as the most frequently recurring terms in both author keywords and titles, indicating that a significant portion of the research focuses on these fundamental topics. Keyword Plus data reveals that financial literacy is associated with various dimensions such as education, behavior, knowledge, impact, determinants, gender, risk, and performance. Meanwhile, author keywords highlight more specific themes like financial inclusion, financial education, household finance, retirement planning, and COVID-19. The frequent use of words like evidence, role, impact, investment, behavior, risk, household, and inclusion in titles suggests that studies aim to provide empirical evidence, analyze specific effects or roles, and focus on financial behavior and risk management. This overall picture demonstrates that financial literacy research takes a multidisciplinary approach, covering a broad range of topics aimed at both theoretical and practical applications.

Author's Keywords Co-occurrence Network

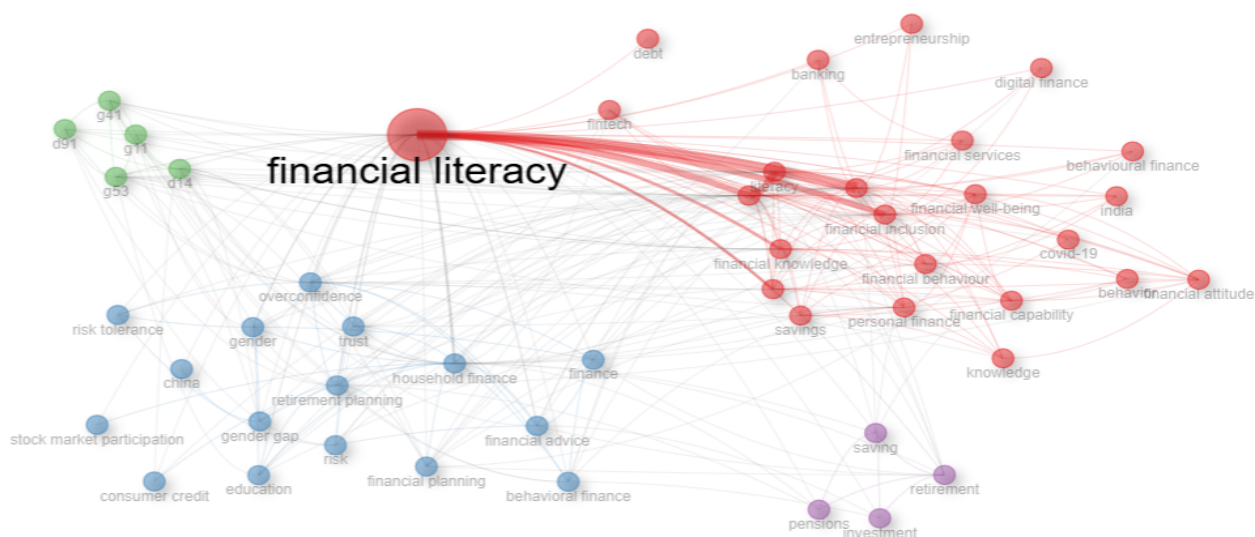


Figure 10. Author's Keywords Co-occurrence Network

Figure 10 presents the keyword co-occurrence network, where financial literacy is the central theme linked with financial inclusion, well-being, education, and retirement planning. The clusters highlight key research directions in behavior, policy, and digital finance. However, terms related to Islamic finance and halal literacy appear rarely, underscoring a conceptual gap that this study seeks to address.

Figure 11 categorizes key themes by their development and relevance. Financial literacy, along with household finance and gender, appears as a motor theme—highly developed and central to the field. Financial inclusion and financial education are basic themes, foundational yet still evolving. Entrepreneurship, digital finance, and micro-finance fall under niche themes, reflecting focused but less broadly connected areas. Notably, Islamic financial literacy is positioned as an emerging or underexplored theme, highlighting a gap in the literature and affirming the relevance of this study.

Thematic Map

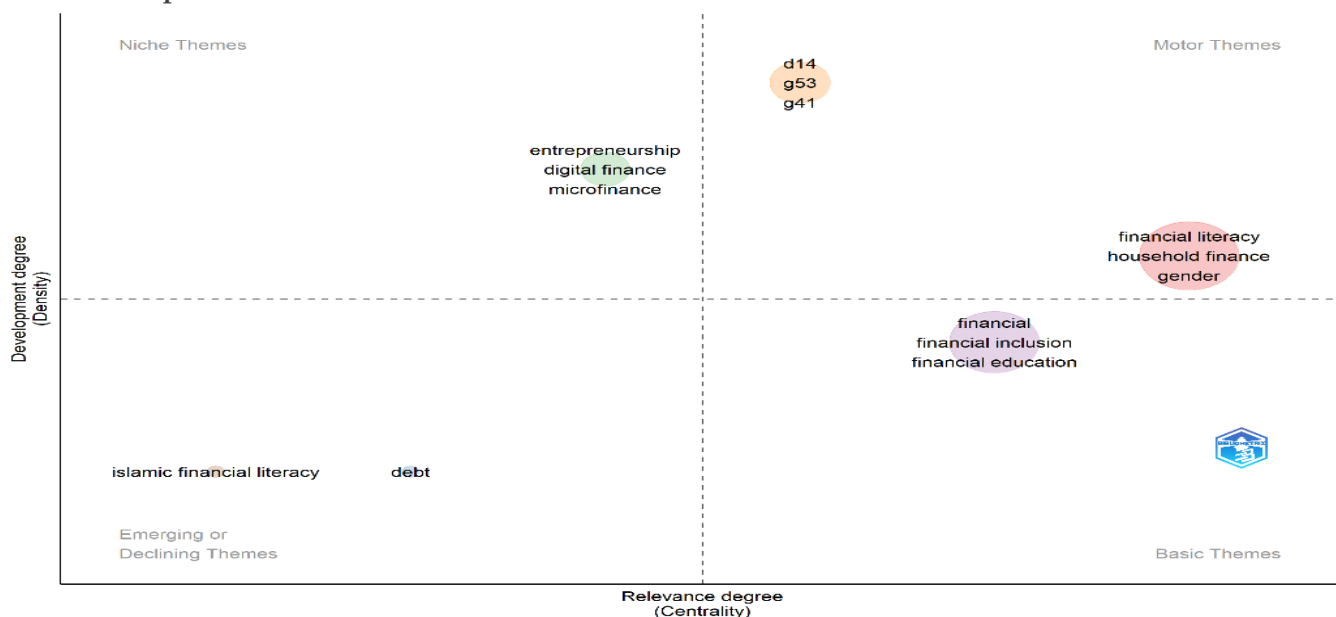


Figure 11. Author's Keywords Thematic Map

Thematic Evolution

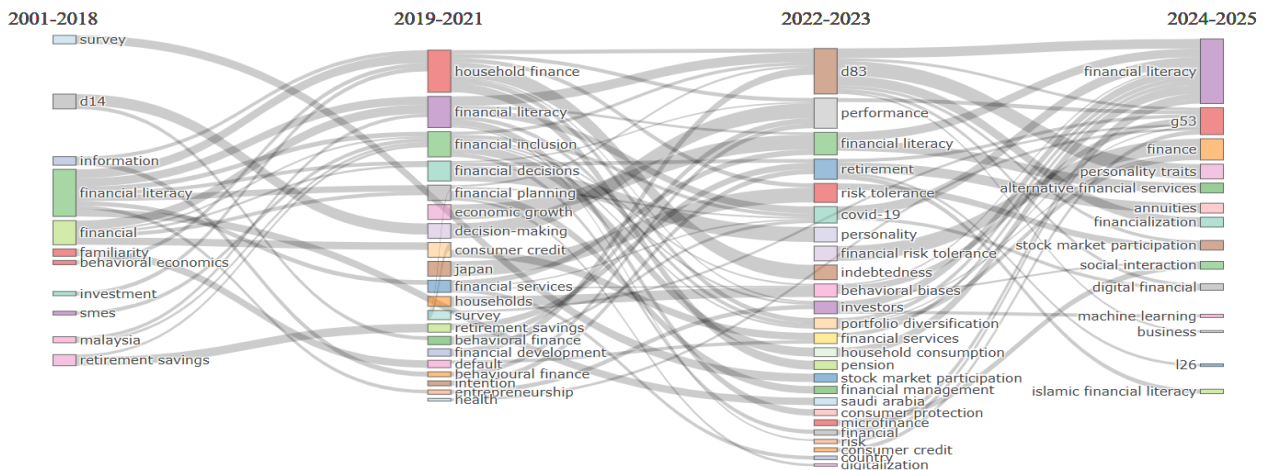


Figure 12. Author's Keywords Thematic Evolution

Figure 12 shows the evolution of key research themes from 2001 to 2025. In the early period (2001–2018), studies focused on behavioral economics, retirement savings, and investment. From 2019 to 2021, themes such as financial inclusion, household finance, and financial planning gained prominence. Between 2022 and 2023, the field expanded toward performance, risk tolerance, and behavioral biases, influenced by contemporary issues like COVID-19. Notably, in 2024–2025, themes such as machine learning, alternative financial services, and Islamic financial literacy begin to emerge—suggesting a growing interest in technology-driven solutions and Shari’ah-compliant financial education.

Lusardi & Mitchell (2014) is the most central and co-cited study, followed by works by Lusardi (2007, 2011) and van Rooij et al. (2011). Two main clusters emerge—one focused on financial behavior, the other on education and capability—highlighting the interdisciplinary nature of the field.

Discussion and Conclusion

The bibliometric analysis of 2,474 publications indexed in the Web of Science database between 2001 and 2025 provides a broad overview of academic engagement with financial literacy and related themes.

Co-citation Network

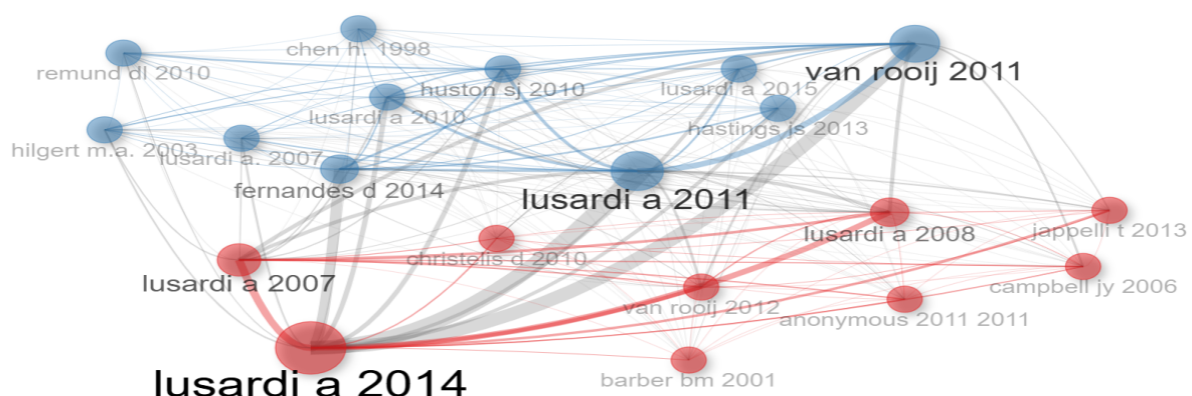


Figure 13. Author's Keywords Thematic Evolution

Figure 13 shows the co-citation network of influential publications.

While the original aim of this study was to explore the intersection of financial literacy, halal

awareness, and Islamic finance, the findings indicate that the dominant scholarly focus remains rooted in conventional financial literacy and behavioral finance.

Terms related to household finance, retirement planning, and general financial education appear frequently and centrally in keyword co-occurrence networks. In contrast, concepts specific to Islamic financial literacy and halal awareness—though present—are scattered, less connected, and remain at the periphery of mainstream discourse. This reveals a notable gap between the intended scope of inclusive, Shari'ah-compliant financial education and the current structure of literature. Although the quantitative growth of publications since 2016, peaking in 2023, reflects increasing academic interest in financial inclusion, the integration of Islamic values into this conversation remains limited and underdeveloped. The results thus underscore the importance of fostering deeper conceptual engagement with Islamic financial literacy and halal dimensions within broader financial literacy scholarship.

Keyword co-occurrence and conceptual structure mapping reinforce this observation. Financial literacy consistently appears as the most central and interconnected term, linked with well-established domains such as retirement planning, financial behavior, and financial inclusion. In contrast, halal-related terms and explicit references to Islamic financial education are marginal, appearing only in isolated clusters or as emerging themes in the thematic map. The thematic evolution analysis similarly shows that while concepts like digital finance, gender, and financial capability have matured and expanded in recent years, Islamic financial literacy has only recently begun to surface, and largely in peripheral contexts. This disconnect is not merely academic. As emphasized in the introduction, real-world financial decisions for many individuals in Muslim-majority societies are shaped by religious norms that standard financial education fails to address. The relative absence of integrated discourse on halal literacy in the academic literature means that key segments of the population—such as small business owners, women, and young adults—remain underserved by both financial institutions and educational

frameworks. In Turkey, where financial literacy rates are as low as 23.6% (FODER, 2015), this lack of culturally attuned financial education represents a significant structural barrier to economic participation. The country-level analysis further reveals that the majority of high-impact publications and influential authors are based in the United States, followed by China, Germany, and the United Kingdom. While these countries demonstrate academic leadership, the geographic imbalance also reflects a gap in representation from Muslim-majority contexts, where issues related to halal finance are more directly relevant. Similarly, the co-citation network analysis reveals a strong concentration of citations around a handful of influential works—primarily by Lusardi, Mitchell, and van Rooij—focused predominantly on Western financial systems and behaviors.

Despite these limitations, there are signs of conceptual and geographic diversification. Recent years have seen the emergence of themes such as digital finance, ethical consumption, and alternative financial services, which offer promising entry points for integrating Islamic finance and halal literacy into broader discussions on inclusive financial development. Notably, the appearance of "Islamic financial literacy" as an emerging theme in the thematic map suggests that scholarly attention is beginning to recognize this gap. The results confirm the originality and timeliness of this study. By applying bibliometric methods to identify both well-established and neglected areas within the literature, this research highlights the urgent need for interdisciplinary, culturally grounded approaches to financial education. Addressing this gap is not only a matter of academic completeness but also a practical necessity for promoting financial inclusion and well-being among Muslim communities worldwide. This study thus contributes to a broader effort to develop financial literacy frameworks that are not only technically accurate but also ethically meaningful and contextually relevant.

Also, the study brings some recommendations to the policy-makers and educational institutions. According to the findings, it is essential for policy-makers to develop culturally sensitive and

Shari'ah-compliant financial education frameworks that address the specific needs of Muslim populations. Financial literacy strategies should incorporate modules on Islamic financial principles, including the prohibition of *riba*, the importance of halal-certified products, and the ethical foundations of Islamic finance. On the other hand also, the educational institutions should integrate Islamic finance concepts into their curricula, not merely as religious subjects but as part of broader financial competence. In Türkiye especially for undergraduate level there is still just 3 Universities offering Islamic Economics and Finance Departments. This number have increase for strengthening the awareness of Islamic Finance and Halal Issues. Collaborative efforts between government agencies, Islamic finance experts, and community organizations can play a pivotal role in improving awareness and accessibility, ultimately promoting more inclusive and ethical financial systems.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *This article does not contain any studies with human participants or animals performed by the author. Therefore, ethical approval was not required.*

Informed Consent: *Not applicable.*

Data Availability: *The dataset used in this study was obtained from the Web of Science (WoS) database, which is publicly accessible.*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

Spatial Analysis of the Israel-Palestine Conflict: Urbicide in Gaza

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Abstract

The Israeli-Palestinian conflict, which dates back many years, involves more than just territorial acquisition or military confrontation; it also has theological foundations in addition to political, socio-cultural, and psychological dynamics. Following Hamas's preemptive attacks on Israel in October 2023, the destruction caused by Israel's airstrikes and systematically implemented policies particularly targeting Gaza has qualities that go beyond the typical damage a city suffers during wartime. The ceasefire declared on January 19, 2025, was violated by Israel with airstrikes on Gaza on the morning of March 18, which specifically targeted civilians. In the October 7 Hamas attack, approximately 1,200 people lost their lives, and 251 individuals were taken hostage by Hamas. As of today, more than 70,000 Palestinians mostly women and children and 850 Israeli soldiers have lost their lives in the ongoing conflict. In addition to the human toll, the destruction in Gaza is of a scale and severity that cannot be overlooked. Given the extent and nature of this destruction, the core objective of this study is to evaluate whether it can be interpreted through the concept of "urbicide," which is understood in the literature as the spatial/urban manifestation of genocide. While the attacks carried out by Israel in Gaza are generally regarded by the public as acts of genocide, from a legal standpoint it is crucial to substantiate such a characterization by demonstrating the nature of these attacks with the support of scientific evidence. To this end, the historical development of the Israeli-Palestinian conflict was reviewed, and the situation in Gaza was assessed using remote sensing and GIS techniques to determine whether it meets the commonly accepted characteristics of urbicide. Based on analyses conducted with remote sensing data provided by the United Nations Satellite Center (UNOSAT), it was found that between October 15, 2023, and February 25, 2025 a total of 11 analyzed time periods 68,154 general buildings, 207 places of worship, 225 educational institutions, and 58 hospitals were completely destroyed. In light of these findings, the study engages in an in depth discussion of whether the policies implemented by Israel in Gaza constitute an act of "urbicide."

Keywords: Israeli-Palestinian conflict, urbicide, remote sensing, geographical information system, urbanization policies

Öz

Arka planı çok uzun yıllar öncesine dayanan ve salt bir toprak elde etme ya da askeri bir çatışma olmaktan öte anlamlar içeren İsrail-Filistin sorunu, siyasal, sosyo kültürel ve psikolojik dinamiklerin yanı sıra teolojik temellere de sahiptir. Ekim 2023 tarihinde Hamas'ın İsrail'e düzenlediği saldırıların akabinde İsrail'in özellikle Gazze'ye yönelik düzenlediği hava saldırıları ve sistematik olarak uygulanan politikalar neticesinde meydana gelen yıkım, bir kentin savaşta gördüğü zararın ötesinde niteliklere sahiptir. 19 Ocak 2025'te ilan edilen ateşkes İsrail'in 18 Mart sabahı Gazze'ye başlattığı özellikle sivilleri hedef alan hava saldırılarıyla ihlal edilmiştir. 7 Ekim'deki Hamas saldırısında yaklaşık 1.200 kişi hayatını kaybederken 251 kişi Hamas tarafından rehin alınmıştır. Günümüze kadar çoğu kadın ve çocuklardan oluşan 70,000'den fazla Filistinli ve 850 İsrail askeri bu süreçte hayatını kaybetmiştir. Bu can kayıplarının yanı sıra Gazze'de meydana gelen tahribat göz ardı edilemeyecek niteliktedir. Gazze'deki yıkımın boyutları ve niteliği göz önünde bulundurulduğunda, bu yıkımı soykırımın mekandaki/kentsel alandaki yansıması olarak literatürde yer bulan "kentkırım" kavramıyla açıklamanın mümkün olup olmadığını değerlendirmek bu çalışmanın temelini oluşturmaktadır. Kamuoyu tarafından İsrail'in Gazze'de gerçekleştirdiği saldırıların genel olarak soykırım olarak kabul edildiği görülmekle birlikte yasal açıdan da bunun sağlanabilmesi için saldırıların niteliğinin bilimsel verilerin desteğiyle ortaya konulması oldukça önemlidir. Bu nedenle İsrail ve Filistin arasındaki çatışmaların tarihsel gelişimi incelenerek Gazze'deki durumun genel kabul gören kentkırım özelliklerini taşıyıp taşımadığı uzaktan algılama ve CBS teknikleri kullanılarak incelenmiştir. Birleşmiş Milletler Uydu Merkezi'nin (UNOSAT) sağladığı uzaktan algılama verileri ile yapılan analizlerin sonucunda, 15 Ekim 2023 ve 25 Şubat 2025 tarihleri arasında incelenen toplam 11 periyotluk veriler sonrasında 68,154 genel yapı, 207 ibadethane, 225 eğitim kurumu, 58 hastanenin tamamen yıkıldığı tespit edilmiştir. Çalışmada elde edilen sonuçlar doğrultusunda İsrail'in Gazze'de uyguladığı politikaların bir "kentkırım" olup olmadığı derinlemesine tartışılmıştır

Anahtar Kelimeler: İsrail-Filistin çatışmaları, kentkırım, uzaktan algılama, coğrafi bilgi sistemleri, kentleşme politikaları

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Introduction

Throughout history, cities have been exposed to devastating impacts due to wars. Since ancient times, the desire to eliminate the settlements of targeted populations, as well as the centers of social production and governance, has rendered cities primary targets. As a result, historical literature includes numerous examples of how wars have led to the destruction of cities and the devastation of cultural heritage.

Pappe (2007) notes that studies on Palestine and Israel are primarily centered around the history of conflict. However, according to him, conflict is not the only factor that defines life in Palestine and Israel. There are various dimensions that should be considered in evaluations. Nevertheless, Western countries and the United States tend to ignore the suffering of Palestinians and view their resistance as terrorist activities against Israel, a state recognized as legitimate. Although technological advancements and the spread of information via social media allow for rapid dissemination of events to the public, this has not led to significant changes in state policies. This trend is also reflected in academic circles and the literature. Even in a country like Turkey, where the majority of the population does not support Israeli policies, an article examining the academic literature highlights this perspective. According to a study by Akkaya and Gürsu (2024), which conducted a bibliometric analysis of academic works in Turkey, there are 481 articles, 36 master's theses, and 7 doctoral dissertations with the keywords "Gaza genocide" and "Palestine issue." Among these, only 14 define what happened in Gaza as genocide. Most of these academic works (13 of them) focus on legal and human rights aspects. These data underscore the importance of this study's contribution to the literature. This research scientifically demonstrates that the acts listed in Article 2 of the United Nations' "Convention on the Prevention and Punishment of the Crime of Genocide" acts that have been recognized as crimes since 1946 are in fact occurring in Gaza. The concepts of genocide and urbicide, which will be further discussed in this study, will be examined in depth.

To evaluate the impact of wars on cities, several historical events can be considered milestones. In

this context, the bombings of Dresden and Hamburg after World War II, and the atomic bombings of Hiroshima and Nagasaki, represent a significant divergence from previous cases of urban destruction due to their unique and far reaching impacts. During the Cold War, military efforts focused on strategic targets rather than urban destruction, with an emphasis on minimizing civilian casualties to legitimize actions (Batuman, 2006). However, after the Cold War, power struggles increasingly occurred in urban areas, turning cities into primary targets of violence (Çağlar, 2020). Today, the nature and reach of wars are rapidly evolving and expanding.

The tension, conflict, and war between Israel and Palestine remain one of the most contentious issues in the Middle East, both historically and today. Between the late 19th century and the early 20th century, establishing a state became the main goal for Zionists. Zionism, which emerged as a result, was largely supported by Western countries, which helped facilitate its objectives. In the pre-Holocaust period, this support was primarily driven by messianic ideological currents, colonial ambitions, and broader geopolitical strategies. According to Zionism, in order to establish the desired state, it was necessary to seize Palestinian lands by forcibly displacing or subjugating the local population. After the establishment of the Zionist state, complete control over the region required a demographically homogeneous population. Israeli policies toward the local population during conflicts reflect this view and exhibit characteristics that were genocidal.

On October 7, the Hamas preemptive attack resulted in the deaths of approximately 1,200 people, mostly civilians, and the abduction of 251 individuals by Hamas, mainly soldiers. As a result of prisoner exchanges during the ceasefire period, 59 prisoners remained unrecovered by Israel. Of these, it is estimated that only 21 are still alive, with the others being killed by Israeli strikes. According to recent data from the Gaza Ministry of Health, more than 61,258 Palestinians, mostly women and children, have been killed in Israeli operations. Additionally, the Israeli army has lost 850 soldiers during this period. Alongside the loss of life, the humanitarian crisis in Gaza has deepened due to

Israel's near complete blockade of humanitarian aid, including the restriction of food, fuel, and water supplies. The destruction of urban infrastructure, coupled with the worsening living conditions through aid restrictions, has systematically resulted in the forced displacement of Palestinians from their living spaces. In line with the genocidal nature of Israeli policies, the destruction in urban areas can also be defined as "urbicide." This study will first provide a brief overview of the historical development of Israeli-Palestinian relations since World War I, then define the concept of urbicide, and finally analyze the destruction in Gaza that constitutes urbicide using Remote Sensing and Geographic Information Systems (GIS) techniques. The destruction has been analyzed using very high spatial resolution (30 cm) satellite imagery provided by the United Nations Satellite Centre (UNOSAT), covering 11 periods between October 15, 2023, and February 25, 2025. The destroyed urban areas have been examined in separate groups and mapped.

This study provides an innovative framework to analyze the spatial consequences of the protracted genocide against the Palestinian population particularly its manifestation in urban destruction by combining remote sensing and GIS techniques. Since 1948, Israel has launched fifteen military operations against the Gaza Strip. Three major wars have also taken place between Israel, Palestine, and Arab countries. While some studies have focused on the urban impacts of these conflicts, this research specifically concentrates on the events beginning on October 7, 2023, and the developments that followed.

Historical Background of Israel-Palestine Relations

Located within the region historically referred to as the "Fertile Crescent," Palestine has been subjected to numerous invasions over thousands of years due to both its rich and strategic natural environment and its significance for the three major monotheistic religions (Karaman, 1996; Taşdemir, 2000). In 1099, Palestine came under Crusader control, but it was recaptured by Muslim rule in 1187 when the Ayyubids conquered Jerusalem. Subsequently, in 1291, it came under the rule of the

Mamluks and remained so for two and a half centuries. Following the Egyptian Campaign of Sultan Selim I. in 1516, the region was incorporated into the Ottoman Empire and remained under Ottoman administration until the end of World War I, 1917.

The Jewish people, meanwhile, had migrated and dispersed widely throughout history, often as a result of persecution and socioeconomic hardship. As a consequence, Jewish identity came to be centered around the notion of a stateless people exiled from their ancestral homeland. Nevertheless, Jews generally maintained the belief that God had promised them the Holy Land and that they would one day return (Skinner, 2003). The migration of Jews from nearly all Christian majority countries to Palestinian territories began in the late 19th century. The period between 1917 and 1948 marks a phase during which efforts were made to Judaize the territory of Palestine (Kişi, 2023). In parallel, 1917 stands out as a significant turning point for the realization of Zionism—a political movement aimed at establishing a Jewish homeland and a sovereign state in Palestine—due to the developments that occurred in that year (Kişi, 2023; Uyanık & Yavuz, 2023). Through formal negotiations, Zionist lobbyists succeeded in convincing British authorities that a Jewish colony in Palestine would better serve Britain's strategic interests (Pappe, 2007).

Britain, the dominant global power of the time, made promises between 1915 and 1918 to various Arab communities in the region, pledging to support their independence. Also, they promised to facilitate the establishment of a homeland for Jews in Palestine. These conflicting commitments laid the foundation for the prolonged conflict in the Middle East and the contemporary Palestinian issue (Taşdemir, 2000). However, contrary to its promises, the British government implemented the 1916 Sykes-Picot Agreement, which divided the promised Arab territories between Britain and France and proposed an international administration for Palestine instead of an independent Arab state (Karaman, 1996). As a result, amid the chaos of World War I (1914–18) and the collapse of the Ottoman Empire, Britain gained control of Palestine, a mandate that was officially sanctioned by the League of Nations in 1922 (Skinner, 2003).

As British authorities encouraged increased Jewish immigration to the region, tensions between the Jewish and Arab populations escalated—particularly following the establishment of the Jewish Agency for Palestine in 1929 by the Zionist organization to coordinate its objectives in the area. The Arab Revolt of 1936–1939 not only convinced the British that Palestine should be partitioned into separate Jewish and Arab states but also prompted them to adopt policies aimed at restricting further Jewish immigration to the region (Skinner, 2003).

World War II (1939–1945) can be regarded as a pivotal turning point for Zionism. A new wave of anti-Semitism in Europe, culminating in the Holocaust, triggered a renewed and significantly larger influx of Jewish immigration to Palestine. As international support for Zionism increased—including from the United States—Zionist leaders continued to promote Jewish settlement despite restrictions imposed by British authorities. As a result, tensions in the Middle East intensified further. Zionist paramilitary groups not only assisted in facilitating illegal immigration, but also engaged in violent confrontations with Arabs and launched insurgent operations against the British. Unable to develop a diplomatic solution to the escalating violence between Jews and Arabs in the region, Great Britain relinquished its mandate in 1947 and transferred responsibility for the Palestine question to the newly established United Nations (UN).

The Partition Plan, presented to the General Assembly by the United Nations Special Committee on Palestine, proposed the termination of the British Mandate and the establishment of separate Arab and Jewish states, while also delineating the borders of Jerusalem as an internationally administered city. Despite opposition from five Arab states, as well as Iran, Pakistan, Afghanistan, and Türkiye, the partition of Palestine was approved by the UN (Sariaslan, 2019).

Zionism, which emerged in the late 19th received substantial backing from Western powers, particularly Britain, whose support was rooted not in a perceived moral obligation toward the Jewish people, but in a long-standing fusion of messianic religious ideology and strategic colonial ambitions.

As El-Awaisi (2019) demonstrates, the notion of establishing a Jewish presence in Palestine predated political Zionism itself, originating in European—especially British—plans to create a “Zionist client-state” or buffer state in the Holy Land to safeguard imperial interests. Such designs were driven by the desire to secure control over strategic trade routes, counter rival powers, and realise certain eschatological visions prevalent in Protestant evangelical thought, thereby embedding the Zionist project within the broader framework of Western colonial policy.

The State of Israel was officially established on May 14, 1948, by David Ben-Gurion, based on the United Nations Partition Plan. Immediately thereafter, Egypt, Jordan, Syria, Lebanon, and Iraq entered the territories declared as part of Israel, initiating the 1948 Arab - Israeli War widely considered the first in a series of Arab - Israeli wars that would continue for decades. As a result of the war, Israel occupied 78% of Mandate Palestine, expanding its territory from the 5,800 square miles allocated under the 1947 UN partition resolution to approximately 8,000 square miles (Sariaslan, 2019).

The West Bank was divided between Israel and Jordan, while Gaza—central to the focus of this study—was partitioned between Israel and Egypt. Following these territorial gains through military action and forced displacement, hundreds of thousands of Palestinians were expelled from their homes, and Israel's political presence in the region was formally established. The United States, the United Kingdom, and several other Western countries officially recognized Israel.

Türkiye initially adopted a “wait and see” approach, but following Israel's admission to the United Nations, it formally recognized the state in 1949. Notably, Türkiye became the first Muslim majority country to recognize Israel diplomatically (Sariaslan, 2019). Diplomatic relations between the two countries have fluctuated over time—ranging from periods of military and trade cooperation to moments when diplomatic representation was suspended or downgraded. As one of the key regional actors, the European Union—having established formal diplomatic relations with Israel in 1959—has maintained its engagement with both Israel

and Palestine in ways aligned with its own strategic interests (Keskin, 2010).

Following the official establishment of the State of Israel, the forced displacement, expulsion, and death of hundreds of thousands of Palestinians accelerated as a result of escalating conflicts. Although Israel claims that Palestinians emigrated voluntarily and that their displacement was not the result of a deliberate policy but rather a consequence of war, it is well documented that during the event known as the “Nakba Catastrophe” or “Great Catastrophe” of 1948, approximately one million Palestinians were subjected to ethnic cleansing and forced into exile. A total of 675 towns and villages across Palestinian territory were destroyed, thousands of Palestinians lost their lives, and thousands more were forcibly displaced. In many of these depopulated areas, place names were changed in a systematic effort to erase Palestinian cultural identity and memory. These actions reflect an intentional strategy to erase the historical and cultural heritage of the Palestinian people (Ari, 2024).

The Second Arab–Israeli War in 1956, also known as the Suez Crisis, erupted following Egypt’s nationalization of the Suez Canal. In alliance with the United Kingdom and France, Israel invaded the Gaza Strip and the Sinai Peninsula. However, due to pressure and intervention from the United States and the Soviet Union, Israel was ultimately forced to withdraw.

In 1959, Fatah was founded in Kuwait by Yasser Arafat, followed by the establishment of the Palestine Liberation Organization (PLO) in 1964.

Following the Six Day War in 1967 between Israel and the Arab states of Egypt, Jordan, and Syria, Israel seized control of the West Bank, East Jerusalem, and the Gaza Strip. Life in the occupied territories became increasingly difficult for Palestinians, and alongside the struggle to establish their own state and reclaim lost lands, Palestinian nationalism began to intensify.

In 1973, the Arab–Israeli War broke out following coordinated attacks against Israel from multiple fronts, including breaches through barbed wire fences between Gaza and Israel. These attacks were led by Arab states under the leadership of Egypt and Syria. The aftermath of the war influenced po-

litical and social dynamics in Gaza, where the Mujama al-Islamiya an Islamic charitable organization with ties to the Egypt-based Muslim Brotherhood was established the same year. This organization later served as the foundation for the creation of Hamas, officially known as the Islamic Resistance Movement, in 1987 by Palestinian imam and activist Ahmed Yasin. Hamas’s stated goal is to establish an Islamic Palestinian state in the West Bank and Gaza Strip, territories occupied by Israel since 1967. As a Palestinian paramilitary group and Sunni Islamist political party, Hamas went on to win the majority of seats in the Palestinian Legislative Council through elections. Following the rise of the Islamic Resistance Movement, the State of Palestine was declared *de facto* on November 15, 1988. To date, 145 of the 194 United Nations member states have recognized Palestine, with several also establishing diplomatic relations.

The Camp David Peace Accords, signed between Israel and Egypt in 1978, enabled Egypt to regain control of the Sinai Peninsula, which it had lost during the Six-Day War. However, what made the agreement particularly significant was that Egypt became the first Arab country to officially recognize the State of Israel under international law.

In 1982, Israel launched the what it termed “Operation Peace for Galilee” with the aim of eliminating Palestinian guerrilla bases in southern Lebanon, eventually advancing as far as the Lebanese capital, Beirut. Following the operation, Lebanese Christian Phalangist militias supported by the Israel Forces carried out a massacre in the Sabra and Shatila refugee camps in Beirut. The atrocity became the subject of an official inquiry by the Kahan Commission in Israel, which ultimately led to the dismissal of the Israeli Minister of Defense.

In 1987, the First Palestinian Intifada (uprising) began, against Israeli occupation in the West Bank and Gaza Strip, lasting until 1993 and resulting in the killing of over one thousand Palestinians. During this period, images of Palestinian civilians confronting the heavily armed and well equipped Israeli military (equipped with tanks, rifles, and full body protective gear) using slingshots, stones, and Molotov cocktails became widespread in the public sphere and gradually normalized. To suppress this example of civil disobedience, Israel employed

excessive force, mass arrests, deportations, and the construction of new settlements. Thousands of Palestinian civilians, including children, were injured or killed during this period, and many others were subjected to physical and psychological torture. The Intifada movements across Palestinian territories became powerful symbols of resistance against the Israeli occupation. Beyond their symbolic importance, these uprisings also represented the Palestinians' assertion of their right to self-determination and national identity (Ari, 2024).

The period between 1993 and 2000 can be considered a partial peace process during which armed conflict between Israel and Palestine gave way to economic transformations (Özkoç, 2009). Through a series of signed agreements, Israel agreed to withdraw from parts of the occupied territories and accepted, in principle, the establishment of an independent Palestinian state. However, despite the absence of direct military conflict, this period also marked a phase in which Israel strengthened its economic structure and implemented various sanctions that effectively rendered the Palestinian economy dependent on Israel. As such, the conflict continued—albeit in a different form—through economic control and structural constraints.

Following Israel's withdrawal from the occupied territories, both Palestinian land and governance became divided, resulting in a dual political structure. Hamas established political dominance and authority in the Gaza Strip, while Fatah maintained control in the West Bank. Citing security concerns, Israel launched a series of military operations against Hamas designated by Israel as a terrorist organization and the Gaza Strip: Operation Cast Lead (Gaza massacre) in 2008, Operation Pillar of Defense in 2012 (Battle of shale stones), Operation Protective Edge in 2014, and Operation Guardian of the Walls in 2021 (Çalık Topuz & Ararat, 2023). The most recent of these operations targeting Gaza—which has become the focal point of the Israeli-Palestinian conflict—serves as the primary point of reference for this study.

Urbicide

The concept of urbicide can be interpreted as the spatial manifestation of genocide. Genocide has been explicitly recognized as a crime by the United Nations since 1948. Not only the commission of genocidal acts but also conspiring to commit them, inciting them directly and publicly, participating in them, or even attempting them, are all considered punishable offenses.

According to Article 2 of the Convention on the Prevention and Punishment of the Crime of Genocide (1948) genocide is defined as:

"any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such:"

- a) Killing members of the group;
- b) Causing serious bodily or mental harm to members of the group;
- c) Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part;
- d) Imposing measures intended to prevent births within the group;
- e) Forcibly transferring children of the group to another group. (United Nations, 1948)

In a manner similar to the foundational logic behind the concept of genocide, the term urbicide—derived from the Latin *urbanus* (meaning “of the city”) and the Greek-rooted suffix *-cide* (meaning “to kill”)—emerged as a term that denotes the destruction not only of the physical elements of urban space, but also of the lifestyle inherently tied to those material conditions. The word *urban* refers not only to the tangible characteristics of a city but also to the social and cultural patterns produced by those characteristics. When combined with the suffix *-cide*, which signifies killing or extermination, urbicide captures the deliberate annihilation of both the city and urban life. The term was initially used as *urbicid* in Serbo-Croatian, later translated into English as *urbicide*, and subsequently into Turkish as *kentkırım*, following similar derivational patterns based on the model of the word *genocide* (Uçar Altınışık, 2022).

The global population residing in urban areas is steadily increasing, rendering cities indispensable living spaces for humankind. In parallel, urban

spaces, under the influence of various risks and conflicts, are at times transformed into literal targets or battlefields. Urbicide represents the most severe and destructive manifestation of these dynamics. In such instances, the urban environment ceases to be merely the stage on which violence occurs and becomes the very object upon which violence is enacted.

It can be argued that the concept of urbicide is still undergoing conceptual maturation. Some scholars classify a wide range of destruction occurring within urban areas—such as wars, urban redevelopment projects, construction and infrastructure works, earthquakes, gang violence, terrorism, and environmental hazards—as forms of urbicide (Karasu & Aksungur, 2025). The emergence of the term can be traced particularly to the 1990s, when it was employed by researchers to describe the impacts of the war in Bosnia and Herzegovina. Examples frequently cited in scholarly work include the Baghdad bombing broadcast live by the global media during the Gulf War (1991), ongoing air raids targeting Kyiv in the Russia–Ukraine War, the Los Angeles riots (1992), terrorist attacks in Mogadishu (1993), the United States’ assault on Fallujah (2004), the Reina nightclub attack in Istanbul (2017), the George Floyd protests in Minnesota (2020), urban renewal projects in Barcelona’s Ciutat Vella Square and Singapore’s Rochor Centre, and, notably, Israel’s assaults on Gaza.

Urbicide refers to the destruction of a population, its culture(s) particularly cultural heterogeneity—and its urban environment (Coward, 2004). It involves the widespread eradication of both the built environment and social diversity, which are foundational components of urban life (Coward, 2006). In essence, urbicide constitutes a deliberate and systematic act of violence targeting both the tangible and intangible elements of the city. When buildings in shared spaces—used by pluralistic communities in their everyday lives—are demolished, and urban infrastructure is eliminated, the possibility for diverse groups to coexist is effectively destroyed (Coward, 2004).

When claims are made that the destruction occurring in a city constitutes urbicide, it is often observed that those responsible for or supportive of the destruction defend themselves using similar

justifications and references. Typically, during military operations, the stated objective is the elimination of strategic, logistical, or military targets. In such cases, civilians—both people and property—may be unintentionally harmed or destroyed, resulting in what is termed collateral damage. Even if the urban environment or historical and cultural structures are not directly targeted during warfare, incidental destruction may still occur (Coward, 2004; Karasu, 2008). However, to classify an act as urbicide, there must be a deliberate targeting of structures and monuments that carry symbolic significance for a particular group. In other words, the destruction of a city’s historical and cultural assets may occur either as a direct objective of urbicide or as unintended collateral damage during warfare—the outcomes may be similar, but the intentions behind them are fundamentally different (Karasu, 2008). Urbicide involves more than simply inflicting material or emotional harm on a specific group. It entails the intentional destruction of urban spaces that serve as vehicles for cultural transmission. Beyond the immediate damage, the objective includes severing intergenerational connections—between past, present, and future (Sipahi & Çakar, 2023). In general, for the destruction of urban areas to be defined as urbicide, several conditions must be met: the existence of prior discursive efforts to “other” the targeted group; the occurrence of destruction within built environments where civilians reside—that is, in urban spaces; the presence of widespread and large scale spatial violence; and the execution of deliberate and planned actions aimed at restructuring the space through controlled and homogenized urban forms (Abujidi, 2019; Yılmaz & Şahin, 2018).

This study aims to evaluate the extent of the destruction carried out by Israel in Gaza and assess whether it meets the criteria outlined above, under various analytical categories.

Study Area and Methods

Study Area

The study area encompasses the Gaza Strip, a narrow coastal territory situated along the eastern Mediterranean, covering an area of approximately 365 km² and geographically positioned around

31.220° N latitude and 34.250° E longitude. Extending roughly 41 km in length and varying in width between 6 and 12 km, the Gaza Strip is home to over 2.3 million people, making it one of the most densely populated regions globally (Andreou et al., 2024). This confined area exhibits an intricate socio-political landscape, shaped by decades of conflict, strict border controls, and ongoing urban degradation. These factors have profoundly influenced local living conditions and disrupted the ecological balance. Due to its geopolitical sensitivity and environmental vulnerability, the Gaza Strip constitutes a compelling case study from both scientific and humanitarian perspectives. The geographic extent of the study area is illustrated in Figure 1.



Figure 1. Study area map (Gaza Strip)

Methods

Remote sensing is based on the principle of acquiring information about objects without any physical contact, by recording and utilizing the data through a sensing device (Lillesand et al., 2004). Satellite systems used in remote sensing enable the differentiation of various surface features on Earth. Geographic Information Systems (GIS), on the other hand, encompass the entire process of storing, analyzing, querying, and presenting spatial data obtained through specific methodologies (Bilgilioglu et al., 2022). Through the integration of remote sensing and GIS, it is possible to conduct detailed analyses and generate comprehensive spatial representations of data. In this study, building damage data derived through remote sensing

techniques by UNOSAT using high-resolution satellite imagery from WorldView-2, WorldView-3, and Pléiades Neo satellites were queried and analyzed within a GIS environment. These satellites offer very high spatial resolution imagery, enabling UNOSAT to accurately identify and map buildings that were either damaged or destroyed. The data, which are freely and publicly available on the official UNOSAT website (<https://gaza-unosat.hub.arcgis.com/pages/data?preview=true>), served as the primary data source for this research and were subjected to further analysis. The technical specifications of the WorldView-2 and 3 and Pléiades satellites are presented in Table 1. Table 2 presents information regarding the observation periods of the study area and which satellites were used during those times. All maps presented in this study were produced using data provided by UNOSAT and generated with ArcGIS Pro software.

Table 1. Specifications of satellite images used in UNOSAT Data (European Space Agency, 2025; Maxar, 2020)

Feature	Specification		
	Worldview-2	Worldview-3	Pléiades Neo
Launch Date	2009	2014	2021 (Neo 3 & Neo 4)
Orbit Type	Sun-synchronous, ~770 km altitude	Sun-synchronous, ~617 km altitude	Sun-synchronous, ~620 km altitude
Panchromatic Resolution	0.46 m	0.31 m	0.30 m
Multispectral Resolution	1.84 m	1.24 m	1.20 m
SWIR Bands/Extra Bands	8 bands (Coastal, Blue, Green, Yellow, Red, Red Edge, NIR1, NIR2)	8 bands (3.7 m resolution)	Red Edge, Deep Blue
Total Number of Bands	9 (1 Pan + 8 MS)	29 (Pan, MS, SWIR, CAVIS)	6 (Pan + MS)
Swath Width	~16.4 km	~13 km	~14 km
Daily Coverage Capacity	~1,000,000 km ²	~680,000 km ²	~1,000,000 km ² (constellation)
Temporal Resolution	Revisit in less than 1 day	Revisit in less than 1 day	Revisit up to 2 times per day

Table 2. Data dates and satellite observations.

Date	Satellite
15.10.2023	WorldView-2
07.11.2023	WorldView-3
26.11.2023	WorldView-3
06.01.2024	Pleiades NEO
29.02.2024	WorldView-3
01.04.2024	WorldView-3
03.05.2024	WorldView-3
06.07.2024	WorldView-3
06.09.2024	WorldView-3
01.12.2024	WorldView-2
25.02.2025	WorldView-3

Findings

Urbicide in Gaza After October 7, 2023

Even prior to 7 October 2023, certain practices implemented by Israel can be regarded as forms of urbicide. Among these are the numerous checkpoints that must be crossed when traveling from one settlement to another or when moving from the Palestinian territories to Israeli cities, as well as the so-called “Security Barrier” in the West Bank—construction of which began in 2002. This structure extends for 720 kilometers, reaches eight meters in height, and comprises electric fencing, watchtowers, and surrounding military roads. Such checkpoints exert an intolerable impact on the daily lives of Palestinians. Nearly half a million Palestinians employed in Israel are compelled to wait for hours at checkpoints each day in order to reach their workplaces, attend school, or visit hospitals—sometimes even within their own neighborhoods.

The “anti-terror wall,” as designated by Israel, cuts directly through the campus of Al-Quds University, separates 11 Palestinian villages and the 95,000 residents therein from their homes, lands, and gardens, and functions not only as an impediment to urban life but also as a tool of segregation and marginalization. Practices justified by Israel on security grounds—such as arrests and detentions,

land confiscations, home raids, curfews, and acts of violence particularly targeting youth—have become a normalized aspect of daily life for Palestinians (Karasu & Aksungur, 2025).

Since October 7, 2023, Israel has been committing an unprecedented act of state terrorism against the Palestinian people—an ongoing crime against humanity carried out in full view of the international community (Ari, 2024). A 300-page report by Amnesty International, a London-based human rights organization, investigates the nine month period following October 7. The report concludes that the Israeli military has violated the United Nations-backed Convention on the Prevention and Punishment of the Crime of Genocide (1948) by committing acts that fall within the definition of genocide: “acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group.” The report draws primarily on field documentation from Gaza and on inflammatory and dehumanizing statements made by Israeli officials. According to the findings, there is no evidence that Israel’s airstrikes from October 2023 to April 2024 were aimed at legitimate military targets. Israel has targeted hospitals, mosques, churches, community facilities, infrastructure for electricity, water, and telecommunications, and even ambulance convoys—openly declaring its disregard for the laws of war and prompting scenes of mass atrocity (Ari, 2024). Since that time, the sites chosen by Israel for attack have continued to lack military value, and the number of civilian casualties has risen exponentially. While Israel continues its operations without pause, images circulating on social media have exposed the nature of the attacks and the tragic toll on civilians through graphic visual documentation. In addition to ongoing assaults on civilians, Israel has committed further violations by cutting off access to electricity and water and by blocking humanitarian aid deliveries intended for Palestinians—further constituting crimes against humanity. Palestinians have been ordered to evacuate the region, yet the evacuation process has been disorganized, unrealistic, and has forced large populations into uncertainty. Even those fleeing in convoys or seeking refuge in camps have been bombed—clearly indicating that the ultimate goal is to remove or elimi-

nate Palestinians from the region entirely. Both Israeli and American officials have publicly stated that they are in negotiations with two regional powers to facilitate the complete evacuation of Palestinians. Previously, settler policies aimed to seize Palestinian properties incrementally; now, however, the rhetoric suggests a full scale destruction of the region in order to reconstruct it entirely for Israeli habitation.

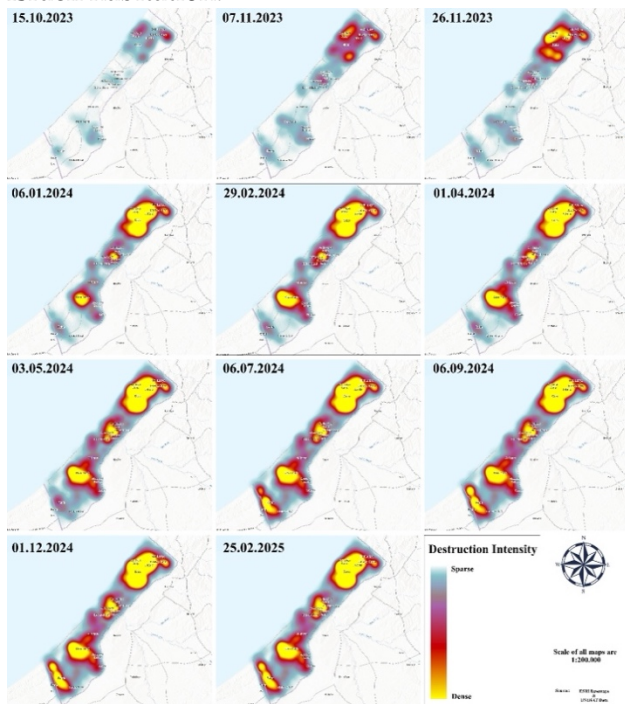


Figure 2. Spatial heat map of attack impacted areas in Gaza after October 7, 2023

Since October 7, 2023, sustained bombardments and assaults by Israeli military forces have dealt a severe blow to urban life in Gaza. The targeted destruction of residential areas and critical infrastructure demonstrates a clear and systematic application of urbicide in the region. Data from this study, derived from UNOSAT satellite imagery, reveal a discernible northward progression of destruction in Gaza, beginning in the south and moving steadily toward the north. Figure 2 presents a heat map showing building destruction based on data collected between October 15, 2023, and February 25, 2025. The map illustrates the intensity of building damage at the onset of the Israeli attacks, as well as the evolving concentration of destruction over successive data acquisition dates. According to building inventory data provided by UNOSAT, 173,350 structures have been identified in the Gaza Strip

using remote sensing techniques. Figure 3 visualizes the changes in these structures from October 15 onward, highlighting newly detected damaged buildings and those with increased damage levels as of November 7.

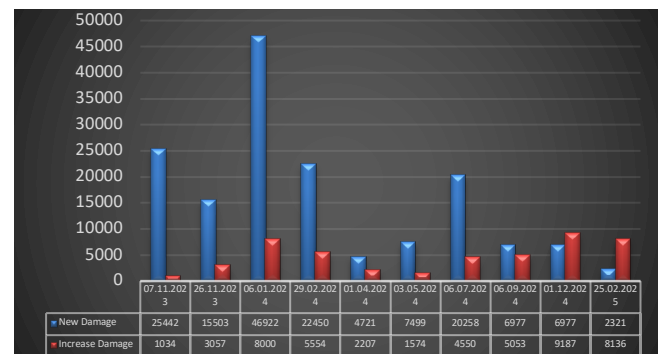


Figure 3. Newly occurred and increased damages after October 15, 2023.

Damaged and Destroyed Structures in the Urban Area of Gaza

This section presents the spatial distribution and interpretation of buildings in Gaza that have been damaged or destroyed. The data collected by UNOSAT have been categorized into several groups, including general buildings/residences, hospitals, educational institutions (school/university), places of worship, industrial facilities, tourism facilities and commercial centers.

General Buildings-Residences

In urban environments, housing plays a critical role in the establishment and continuity of daily life. Residential structures, which are essential for human survival and protection from environmental factors, have been among the most heavily damaged elements during the attacks on the Gaza Strip. Remote sensing analyses conducted in Gaza have identified approximately 170,000 structures classified under the “general buildings-residences” category. Post October 7, 2023, assessments reveal that around 70,000 of these buildings have been completely destroyed. To visualize the status and spatial distribution of structures in the general buildings category, a map was produced (Figure 4). This map clearly illustrates the density and distribution of general buildings across the

Gaza Strip. At the beginning of the attacks, 1,906 buildings were identified as destroyed, 2,062 as severely damaged, 6,213 as moderately damaged, and 3,941 as possibly damaged. According to the most recent dataset, these figures have escalated dramatically to 68,143 destroyed, 18,282 severely damaged, 51,011 moderately damaged, and 29,273 possibly damaged structures. As these structures constitute the majority of Gaza's urban fabric, they continue to suffer damage beyond the period covered by this study. The destruction or impairment of these buildings poses serious consequences for the urban population, including a sharp decline in living standards, widespread displacement, and the growing risk of homelessness.

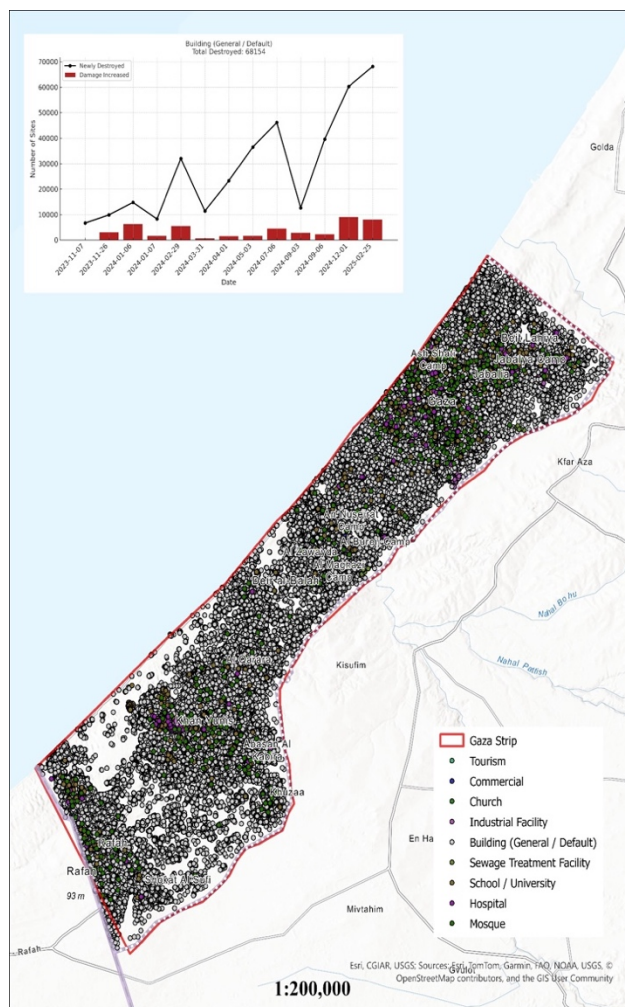


Figure 4. Spatial distribution and damage classification of structures in the "General Buildings-Residences" category across the Gaza Strip.

Hospitals and Medical Facilities

Hospitals play a vital role in protecting public health, treating illnesses, and combating epidemics. However, due to the ongoing conflict in Gaza, many hospitals have either been severely damaged or completely destroyed. This has resulted in the collapse of healthcare services, the near total cessation of treatment processes, and thousands of reported civilian fatalities. Medical personnel are being forced to provide treatment in unsanitary and unsafe conditions, risking their own lives in the process.

Satellite data obtained after October 7 indicate that a large number of hospitals in Gaza have been completely destroyed or rendered severely inoperative (see Figure 5). Initial data show that, during the first wave of attacks, 3 hospitals were completely destroyed, 4 were severely damaged, and 5 were moderately damaged. As the attacks continued, these numbers rose significantly. According to the most recent dataset, 58 hospitals or medical facilities have been completely destroyed, 42 are severely damaged, and 110 are moderately damaged.

A closer analysis of the most recent high resolution satellite imagery reveals that several of Gaza's largest and most critical healthcare institutions have been struck. Al-Shefa'a Hospital, the largest medical complex in the territory, has sustained multiple direct hits with several buildings completely destroyed. Beit Hanoun Hospital has also suffered catastrophic losses, and other key facilities such as Al Qudse Hospital, Al Naseer Pediatric Hospital, Al-Ranteesi Al-Naser Paediatric Hospital, and the Jordanian Hospital have been either destroyed or heavily damaged. The destruction of these major hospitals has critically reduced the already limited healthcare capacity, leaving thousands without access to essential medical services.

Overall, the data indicate a deliberate and systematic pattern of strikes on major healthcare centers, reflecting a scale of destruction that will have long-term consequences for public health in Gaza.

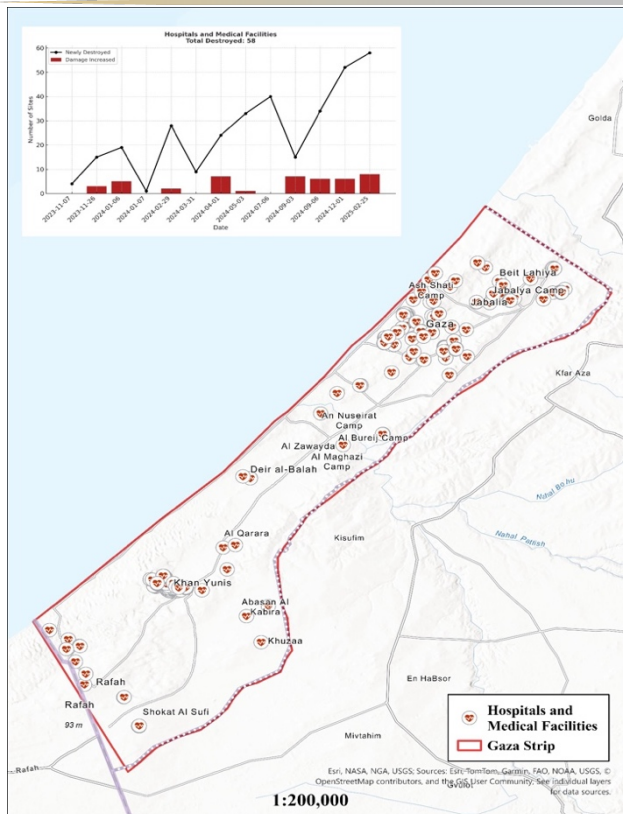


Figure 5. Distribution map and damage status of hospitals and medical facilities in the Gaza Strip.

Educational Institutions (Schools and Universities)

The development and long-term sustainability of societies depend fundamentally on education. Educational institutions are among the most critical infrastructures shaping the future of any nation; their destruction can significantly hinder societal progress, cause communities to lag behind others, and jeopardize their prospects for development.

In the context of the ongoing Israel–Palestine conflict, educational facilities—traditionally regarded as safe spaces for learning and, in times of crisis, potential shelters for civilians—have increasingly become targets of airstrikes and artillery fire. This has rendered many schools and universities across the Gaza Strip either severely damaged or completely unusable.

Based on UNOSAT satellite damage assessments, the situation has worsened dramatically over time. As illustrated in Figure 6, the initial dataset recorded a total of 1,022 educational facilities, including both schools and universities, of which 3 were completely destroyed, 6 severely damaged,

18 moderately damaged, and 8 possibly damaged. The most recent assessment, however, indicates a drastic escalation: 225 facilities have been completely destroyed, 211 severely damaged, and 498 moderately damaged.

Within this broader category, UNOSAT data identify 19 universities across the Gaza Strip, collectively comprising 124 buildings that have been directly affected by Israeli attacks. Of these, 33 buildings were already classified as completely destroyed at the time of the most recent assessment. The temporal patterns in the university dataset demonstrate a clear progression of damage, with numerous facilities transitioning from lower damage categories to total collapse during the observation period.

The same figure also presents the school dataset, which reveals a consistent increase in both the severity of damage and the number of destroyed facilities over time. These patterns collectively point to a systematic dismantling of Gaza’s educational infrastructure.

These findings suggest that beyond immediate harm, the targeting of educational institutions is part of a broader strategy to erode the foundations of Palestinian society and undermine its capacity to recover.

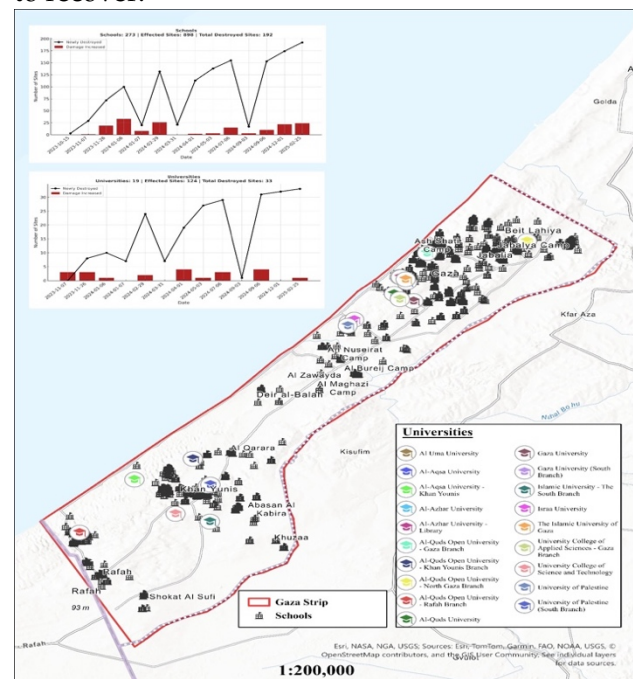


Figure 6. Spatial distribution and damage status of educational institutions (schools and universities) in the Gaza Strip.

Places of Worship

Places of worship are sacred spaces where individuals are free to practice their religious duties and which serve as symbols of social cohesion and peace. The targeting of such sites during wars or conflicts results not only in physical destruction but also in profound spiritual and cultural trauma. International legal authorities explicitly emphasize the obligation to protect places of worship during armed conflict (International Committee of the Red Cross, 1977). However, an analysis of recent attacks in Gaza reveals a blatant disregard for international law, with many religious structures having been destroyed or damaged.

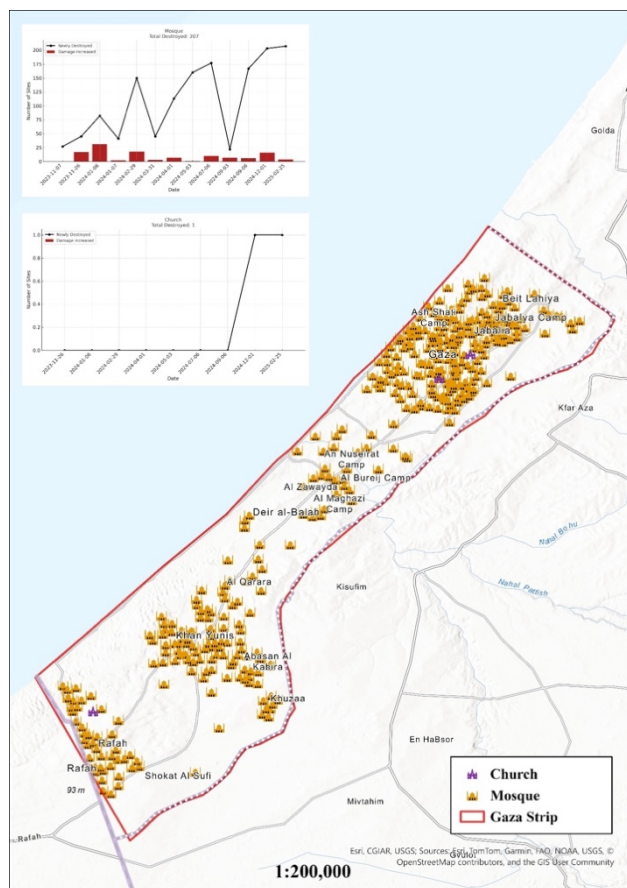


Figure 7. Distribution and damage status of mosques and churches in the Gaza Strip.

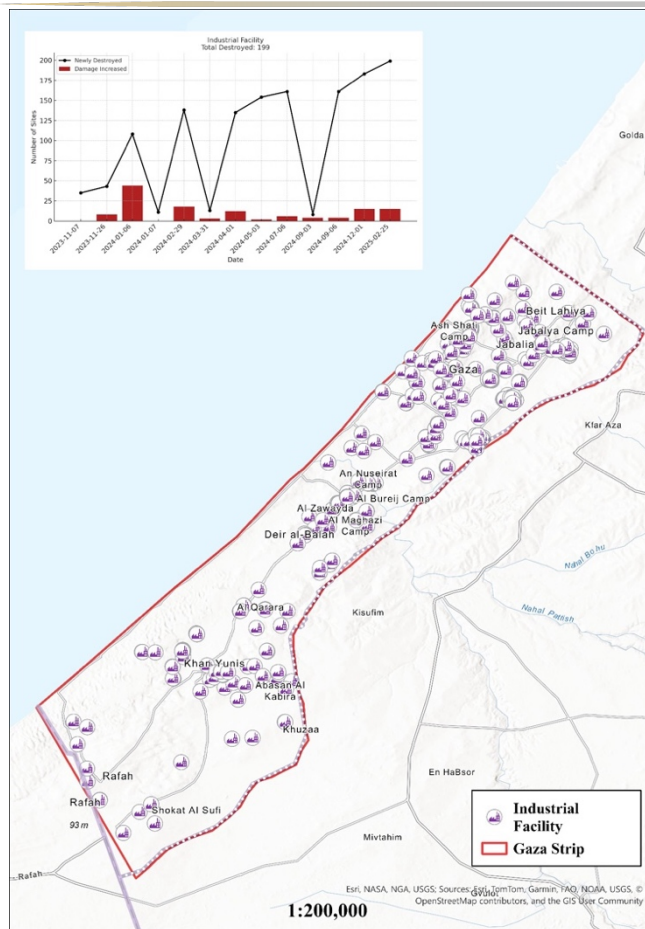
Remote sensing data from the Gaza Strip show that, during the initial wave of attacks, 3 mosques were completely destroyed, 4 were severely damaged, 21 were moderately damaged, and 7 were possibly damaged. By the date of the most recent dataset, the number of destroyed mosques had risen to 207, while 130 were severely damaged and

71 were moderately damaged. Among the destroyed mosques was the Great Omari Mosque, a historic and culturally significant landmark in Gaza's Old City that was largely destroyed in an Israeli air strike on 8 December 2023. In addition to mosques, Gaza is home to three churches, one of which was confirmed to have been destroyed in the dataset dated September 6, 2024. These findings suggest that Israel's attacks have not only targeted Muslim places of worship but also those of the Christian community residing in the region. Figure 7 maps the locations of mosques and churches in the Gaza Strip and illustrates their damage status through supporting graphical data.

Industrial Facilities

Industrial facilities are among the foundational components of a country's economic infrastructure. The functioning and sustainability of critical services such as production, energy, and food supply depend on the uninterrupted operation of these facilities. The destruction of key installations—such as power plants, water treatment plants, or manufacturing factories—can severely disrupt essential services. When such facilities are targeted or destroyed during conflict, they not only reduce the population's immediate standard of living but also undermine the region's ability to recover economically in the post-conflict period. The targeting of Gaza's industrial areas by Israel during the conflict has also impeded the local population's ability to plan for the future.

Figure 8 presents the spatial distribution and damage statistics of industrial facilities in the Gaza Strip. In the initial post-October 7 dataset, 4 facilities were found to be completely destroyed, 13 severely damaged, 22 moderately damaged, and 6 possibly damaged. According to the latest dataset from February 2025, 199 industrial facilities were confirmed as completely destroyed, 77 as severely damaged, and 121 as moderately damaged.



Gaza Strip based on satellite imagery. Of the 75 commercial centers identified, initial data indicate that 1 was completely destroyed, 3 were severely damaged, and 3 were moderately damaged.

In the most recent dataset, the number of completely destroyed commercial centers increased to 27, while 12 were classified as severely damaged and 33 as moderately damaged.

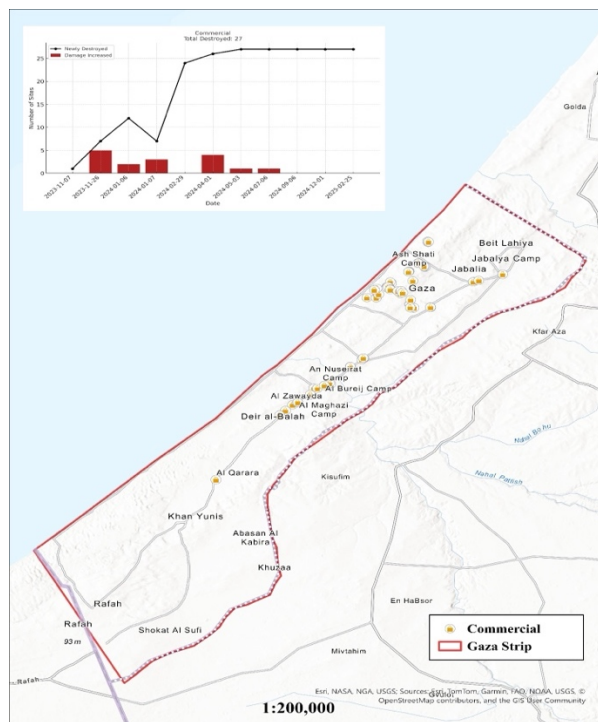


Figure 10. Distribution and damage status of commercial centers in the Gaza Strip.

Reflections of the Gaza Crisis in Public Discourse and the Diplomatic Positions of States

Since the Nakba catastrophe, Zionists and their supporters have continuously argued that the displacement of Palestinians was not part of a systematic plan, whereas Palestinians and their advocates claim—supported by various pieces of evidence—that the process constituted an ethnic cleansing campaign. Two prominent historians, Benny Morris and Ilan Pappé, have emerged as leading voices in the academic and public discourse on this issue. Each has substantiated their respective perspectives through numerous scholarly publications and books.

In the contemporary era, control over communication processes plays a pivotal role in enhancing

a country's influence and power globally. Consequently, those who dominate communication technologies—whether societies or groups—may, at times, intentionally mislead the public or manipulate information to serve their own interests. This disinformation process extends beyond traditional media to include the production of content across various social media platforms (Geneş & Taydaş, 2024). A recent study that examined content verification data from a fact checking platform analyzing suspicious social media content about the Israel–Palestine conflict (between October 7 and December 31, 2023) revealed that out of the most widely shared posts, 109 were false, 2 were accurate, and 1 was a mixture of both. Among the types of misinformation detected were: 79 false associations, 4 distortions, 4 fabrications, 3 manipulations, 1 impersonation, 1 parody, 7 false association/fabrication, 4 false association/out of context, 3 false association/manipulation, 2 fabrication/manipulation, and 1 false association/distortion (Aydın, 2024). In this context, it is nearly inevitable that media—and especially social media—will produce misleading results regarding ongoing conflicts. For this reason, studies based on scientific methods are crucial in providing accurate and objective insights. Particularly through social media, a considerable volume of misleading information is deliberately disseminated at high speed in an effort to shape public perception. These narratives often inaccurate and, in many cases, deliberately distorted serve to obscure, and in effect conceal, the realities of the genocide and uricide taking place in Palestine. In countering such perception management campaigns, it is essential to conduct research grounded in empirical evidence and to present information obtained from reliable sources in accordance with objective criteria. Such an approach is crucial not only for informing the public accurately, but also for ensuring the integrity of historical assessments.

The stances adopted by countries in the face of conflicts—whose roots often extend back centuries—are shaped not only by historical ties but also by contemporary geopolitical dynamics. As in the past, the United States and its leaders have declared unconditional support for Israel. President Trump even shared on social media his vision of

the region post-conflict, explicitly expressing a scenario where Palestinians were entirely removed from the area.

In contrast, the European Union's policies toward the Israel–Palestine conflict differ from those of the United States, which provides unwavering political and military support to Israel. While EU policies contain features that appear more favorable to Palestinians, it is evident that the EU's foreign policy instruments remain insufficient in addressing the ongoing crisis (Keskin, 2010).

Discussion and Conclusion

This study focuses on a region whose historical background dates back centuries and which has never lost its status as the epicenter of conflict. Specifically, it aims to reveal the consequences of the urban destruction caused by Israel in the Gaza Strip following October 7, 2023. The hypothesis guiding this research was that the destruction in Gaza does not constitute incidental or collateral damage resulting from armed conflict, but rather a deliberate and systematic act of urbicide. The findings strongly support this hypothesis.

Beyond political discourses, the maps, the number and characteristics of the destroyed or damaged buildings clearly demonstrate that civilians were intentionally targeted, and that the complete annihilation of the city was one of the central goals. Beginning with the northern part of Gaza, Israel called for civilian evacuation, yet even those who heeded the warnings and moved along the suggested routes were still targeted. Moreover, the destruction of urban infrastructure essential to civilian survival—such as hospitals, educational institutions, commercial zones, and water or electricity supply systems—further reinforces the planned nature of the attacks.

In this study, building data derived from UN-OSAT satellite imagery was analyzed and spatially mapped. A total of 11 datasets from different dates were examined using remote sensing and GIS techniques. The analysis reveals that the attacks began in the north and progressed systematically southward across the Gaza Strip (see Figure 2). This calculated progression forcibly displaced people from

their homes and continued to deny them the right to live even in the places to which they fled.

According to the data, out of 173,350 structures detected via satellite imagery, 68,918 were completely destroyed, 18,782 were severely damaged, 51,875 suffered moderate damage, and 29,273 were classified as possibly damaged since October 7, 2023. The widespread destruction of general buildings, which form the core of Gaza's urban residential fabric, stands as a striking indicator of the urbicide conducted by Israel.

The devastation in Gaza extends beyond residential areas. Hospitals, which are vital to public health, educational institutions, which form the foundation of society, and industrial facilities, which sustain the region's economic activity, have all been targeted and severely damaged. The destruction of these structures not only causes direct harm to infrastructure but also prevents the survival of the civilian population by cutting off access to clean water, electricity, and international humanitarian aid. Despite these dire circumstances, civilians who manage to survive are systematically forced to abandon their homeland.

This ongoing genocide, occurring in the 21st century and in full view of the international community, is accompanied by urbicide, which can be described as the spatial manifestation of genocide. The numerical data and geospatial analyses provided through satellite mapping substantiate this reality. Although global public opinion appears to express strong solidarity with the people of Gaza, this popular empathy is not reflected in official state policies.

The findings of this study have significant theoretical, practical, and political implications. Theoretically, they contribute to the literature on urbicide by offering a spatially grounded case study that links deliberate urban destruction to broader concepts of genocide and spatial justice. Practically, the evidence underscores the urgent need for international monitoring mechanisms capable of documenting and prosecuting urban destruction as a distinct category of crime. Politically, the results highlight the necessity for the international community to recognize the destruction in Gaza not only as a humanitarian crisis but also as a spa-

tial crime that systematically targets the urban fabric and civilian life. Such recognition would require the development of new legal frameworks and policy instruments aimed at preventing and punishing urbicide in armed conflicts.

Based on these findings, several recommendations emerge. Policymakers and international organizations should adopt legal definitions of urbicide and incorporate them into humanitarian and criminal law to ensure accountability. Reconstruction plans for Gaza must prioritize the restoration of essential urban infrastructure such as hospitals, schools, and utilities to safeguard the survival and dignity of the civilian population. Humanitarian aid strategies should also address the spatial dimensions of displacement and urban fragmentation caused by systematic destruction. For future research, it is essential to examine the long-term social, cultural, and psychological consequences of urbicide in Gaza through ethnographic and participatory approaches, with particular attention to how the deliberate dismantling of the city's spatial fabric undermines community resilience and identity. Comparative analyses with other documented cases of urban destruction could not only refine theoretical understandings of urbicide but also strengthen the legal and political frameworks necessary to hold perpetrators accountable under international law, thereby safeguarding the urban heritage and the right to the city for the Palestinian people.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The authors declare no conflict of interest.*

Ethical Approval: *This article does not involve any studies with human participants or animals conducted by the authors. Therefore, ethical approval was not required.*

Informed Consent: *Not applicable.*

Data Availability: *All data used in this study were obtained from the publicly available datasets of the*

United Nations Satellite Centre (UNOSAT) (<https://gaza-unosat.hub.arcgis.com/pages/data?pre-view=true>).

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AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the authors in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

Women's Domestic Spatial Experiences Through Privacy, Personal Space, and Belonging: A Gendered Perspective

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Abstract

This study aims to provide a comprehensive analysis of women's spatial experiences within domestic settings across different geographical regions of Turkey, through the lens of gender. It focuses specifically on the themes of privacy, personal space, and a sense of belonging. In-depth interviews were conducted either face-to-face or online with 66 women aged between 20 and 80 residing in various regions of the country. During the interviews, participants responded to questions regarding their demographic characteristics, features of their residences and surrounding environments, spatial practices, and the meaning they attribute to the home. The research employed qualitative methods, including literature review, direct observation, and audio-recorded interviews as data collection tools. A descriptive analysis approach was adopted to examine the data. Grounded in the thematic framework of privacy, personal space, and belonging, the study presents an original contribution by exploring the symbolic and experiential meanings ascribed to the home. The findings reveal that gender roles not only shape women's social positions but also influence their spatial relationships within the domestic environment. Moreover, the study underscores the impact of the physical environment on women's sensory comfort in the home.

Keywords: Women, gender, domestic space, privacy, belonging

Öz

Çalışma ile Türkiye'nin farklı coğrafyalarında yaşayan kadınların konut içi mekânsal deneyimlerini, toplumsal cinsiyet bağlamında ele alarak mahremiyet, kişisel alan ve aidiyet temaları üzerinden kapsamlı bir biçimde değerlendirmeyi amaçlamıştır. Türkiye'nin farklı coğrafyalarında ikamet eden 20-80 yaş aralığındaki örneklem kadın katılımcılar (n=66) ile yüz yüze veya çevrimiçi görüşme gerçekleştirilmiştir. Görüşmede katılımcılar demografik özelliklere, konut ve çevresine dair özelliklere, mekân kullanımına ve konutun anlamına yönelik soruları yanıtlamışlardır. Çalışmada literatür araştırması, gözlem, görüşmeler, ses kaydı gibi veri toplama yöntemlerinin yanı sıra betimsel analiz içeren nitel bir yöntem izlenmiştir. Betimsel analiz ile mahremiyet, kişisel alan ve aidiyet temalarından yola çıkılarak konuta yüklenen anlamların belirlenmesi açısından özgün bir çalışma niteliği taşımaktadır. Çalışmanın bulguları, toplumsal cinsiyet rollerinin sadece kadınların toplumsal konumlarını değil, aynı zamanda konut içi mekânsal ilişkilerini de belirlediğini ortaya koymuştur. Ayrıca fiziksel çevrenin kadınların duyuşsal konforu üzerindeki etkisini de çalışma ile tespit edilmiştir.

Anahtar Kelimeler: Kadın, toplumsal cinsiyet, konut, mahremiyet, aidiyet

Introduction

The concept of gender has long been a subject of inquiry across a wide array of disciplines, including medicine, biology, sociology, psychology, religion, and philosophy. Among the defining characteristics of human identity, gender holds a fundamental place. From a basic social perspective, society is traditionally composed of two sexes—male and female—a distinction that, in and of itself, does not imply any form of hierarchy or superiority (Ünal et al., 2017). However, when cultural, economic, and political meanings are ascribed to biological sex, it transforms into a socially constructed phenomenon referred to as gender (Akkaş, 2019). Expectations regarding gender roles vary across societies and may even diverge within different strata of the same society (Altıparmak, 2018). Since the latter half of the 20th century, particularly after the 1950s, the concept of gender has gained prominence in academic research, especially in relation to the roles attributed to men and women. Gender, as a sociocultural construct, structures the organization of roles and practices across all dimensions of life shaped by human agency, including the built environment (Özsoy et al., 2017). In this sense, the influence of gender is readily observable in fields such as politics, economics, sociology, religion, education, and health, as well as in architecture and spatial organization, where architectural forms and spatial arrangements bear the imprints of gender ideologies.

From antiquity through the Industrial Revolution, patriarchal structures relegated women to secondary status within social and spatial hierarchies. The advent of industrialization and the rise of mass production reshaped labor relations, bringing women into the workforce and gradually undermining traditional patriarchal norms. As women increasingly participated in public life and engaged in waged labor, domestic responsibilities were no longer the sole domain of women, although the dual burden of domestic and external responsibilities intensified their workload (Akyol & Polatoğlu, 2017). This shift had a direct impact on residential spatial organization. Verschaffel (2002) argues that the home, as a place of belonging, is simultaneously the locus of continuity and transformation enacted by women's labor. While

the link between domestic space and gender has been explored within various disciplines, it did not emerge as a recognized topic of scholarly investigation within architecture until the late 1970s and only became more visible in the 1990s (Sarı, 2022). Doreen Massey's seminal work *Space, Place and Gender* (1994) situates geography as a critical framework for discussing gender, examining spatial divisions of labor and economic organization in relation to socio-economic power structures. Similarly, Colomina's *Sexuality and Space* (1992) offers an interdisciplinary investigation into the intersections of architecture, gender, and sexuality, arguing that domestic architecture both reflects and reinforces patriarchal ideologies and should be understood as a mode of cultural production.

In the Turkish context, women's domestic spatial experiences have historically undergone significant transformations. During the Ottoman period, haremlik-selamlık divisions, high courtyard walls, and latticed windows functioned as spatial strategies to safeguard privacy and reinforce gendered boundaries (Asatekin, 1994). In the early Republican era, the transition to apartment living reshaped the configuration of the home, with the kitchen, living room, and balcony emerging as focal spaces of women's everyday practices (Bozdoğan, 2001). In contemporary times, however, standardized housing typologies and gated communities have redefined notions of privacy and belonging, while often constraining women's opportunities for personal space (Türkün, 2011).

More recently, these typologies have reshaped domestic experiences in ways that diverge from traditional housing. Privacy is no longer safeguarded primarily through layered thresholds such as entrance halls or courtyards, but rather through individualized and techno-spatial controls, including visual screening, acoustic separation, and surveillance systems (Çetin & Beyhan, 2025; Obeidat et al., 2025; Hammad et al., 2025). Belonging, once rooted in kinship-based neighborhood ties, is increasingly constructed through the branding of security and semi-public amenities within gated compounds, which intensify internal cohesion while weakening everyday connections to the surrounding urban fabric (Evren & Kafescioğlu, 2025; Amirjani et al., 2025). At the

same time, standardized floor plans privilege efficiency over flexibility, often failing to accommodate women's need for autonomous and adaptable spaces—a deficiency further magnified by the post-COVID demand for door-separable work or study areas (Moshaver et al., 2024; Foster & Judd, 2024). These transformations demonstrate that contemporary housing does not merely continue historical practices but actively reshapes women's spatial experiences by replacing communal and symbolic strategies of privacy with individualized, commodified, and security-oriented notions of domestic life (de Macedo et al., 2022; Gökçe & Chen, 2021).

Within this broader framework, researchers have emphasized that women's spatial experiences differ significantly from men's. While men often associate the home with leisure and social interaction, women's engagement with domestic space encompasses both production and reproduction processes, ranging from caregiving to household labor (Dedeoğlu, 2000; Bora, 2011). National statistics confirm that Turkish women spend significantly more time in domestic environments compared to men (Turkish Statistical Institute [TÜİK], 2022). This disproportionate presence renders their experiences of privacy, personal space, and belonging not only more layered but also more intense and multifaceted. Privacy becomes layered through the constant negotiation of visibility, auditory control, and social accessibility within the home, often extending beyond physical boundaries to include cultural expectations of modesty and propriety (Altman, 1975; Obeidat et al., 2025). Personal space, meanwhile, gains intensity by being repeatedly fragmented across multifunctional rooms—kitchens, balconies, or shared living areas—where women must balance individual autonomy with family responsibilities (Madigan & Munro, 2002; Koçak Turhanoglu & Beklan Çetin, 2023). Belonging becomes multilayered as well, simultaneously tied to emotional attachment, caregiving roles, and the symbolic identification of women with the domestic sphere (Moreira & Farias, 2022; Gökçe & Chen, 2021). Consequently, the home functions not merely as a shelter but as a site of identity formation, boundary negotiation, and

reproduction of gendered roles, where the intensity of women's spatial experience reflects both their extended temporal presence and the multiplicity of functions they fulfill.

Although numerous studies have examined the relationship between women and domestic space, most have been limited to particular cities or small-scale case studies (Öymen Gür & Yalçınkaya Erol, 2013; Erdaş & Özmen, 2019). Research that simultaneously considers differences across regions and age groups remains scarce. Moreover, concepts such as privacy, personal space, and belonging—though widely acknowledged—have rarely been systematically analyzed within the intersectional context of women's domestic experiences in Turkey. This study seeks to address this gap by exploring how women from diverse regions and age cohorts articulate the meanings of home, their experiences of privacy, and their pursuit of personal space within everyday domestic practices.

Accordingly, this study argues that women's domestic spatial experiences in Turkey—particularly regarding privacy, personal space, and belonging—are not uniform but vary significantly across age cohorts and regional contexts. The findings demonstrate that younger women (20–49) emphasize autonomy and social interaction, often linking privacy to leisure and personal expression in shared spaces such as living rooms and balconies. Middle-aged women (50–64) negotiate caregiving responsibilities and limited personal autonomy, frequently transforming kitchens and balconies into semi-private retreats that balance collective duties with individual needs. Elderly women (65+) prioritize continuity, comfort, and routine, attaching belonging to familiar domestic rituals and outdoor extensions such as terraces. Regional variations further reveal that urban participants are more concerned with visual and auditory privacy due to dense apartment living, whereas rural and semi-urban women encounter challenges related to porous household boundaries, extended family living, and olfactory discomfort from agricultural surroundings.

By situating these generational and regional differences at the intersection of privacy, personal space, and belonging, the study makes an original contribution: it demonstrates that contemporary

housing typologies in Turkey often fail to respond to women's differentiated needs, thereby highlighting the necessity of gender-sensitive and context-aware design strategies. In this way, the research not only documents women's lived experiences but also advances a critical argument—that the design of domestic space must move beyond standardized solutions to incorporate the layered, age-specific, and region-specific dimensions of women's spatial practices.

Literature Review

The present study is structured around three inter-related concepts—privacy, personal space, and belonging—all of which acquire distinctive meanings when interpreted through the lens of gender. In patriarchal societies, privacy has historically been negotiated through architectural and spatial strategies designed to regulate women's visibility and mobility. Colomina (1992) argues that domestic architecture functions as a cultural apparatus, simultaneously reproducing and concealing gendered hierarchies. Similarly, Massey (1994) highlights that space and place are not neutral containers but are actively constructed by power relations, including those of gender. Within this framework, privacy transcends its functional dimension and becomes a cultural code: women's ability to shield themselves from external surveillance and regulate access to the domestic sphere is deeply shaped by social expectations and gendered divisions of labor.

Personal space, when examined through a gendered perspective, encompasses both physical and psychological domains. For women, the scarcity of individualized areas in the home often signifies a lack of autonomy and limited opportunities for self-expression (Hunt, 1989; Madigan & Munro, 2002). Unlike men, who may enjoy designated spaces such as a study or lounge, women's personal spaces are frequently improvised or fragmented—corners of kitchens, balconies, or shared rooms. The absence of stable, woman-defined spatial territories is thus not merely architectural but reflects broader dynamics of inequality in domestic power structures (Koçak Turhanoğlu & Beklan Çetin, 2023).

Belonging refers to the sense of security, attachment, and emotional rootedness that individuals associate with the home. For women, belonging is intricately tied to gendered responsibilities of caregiving and household management (Prost, 1992; Bora, 2011). The home becomes simultaneously a site of identity affirmation and a locus of invisible labor. Moreira and Farias (2022) demonstrate that gendered patterns of belonging manifest in the ways interiors are designed, decorated, and appropriated, further reinforcing distinctions between “feminine” and “masculine” domestic roles. This perspective resonates with the findings of Imamoğlu and Imamoğlu (1996), who underscore that the symbolic value of home in Turkey is strongly mediated by women's engagement with everyday domestic practices.

Although these three concepts have often been examined separately, they are deeply interconnected. Privacy enables the boundaries necessary for constructing personal space, while personal space provides the material and symbolic grounds on which belonging is cultivated. In other words, the absence of privacy undermines women's ability to carve out personal territories, and without such spaces, the sense of belonging remains fragile or imposed rather than chosen. Thus, privacy, personal space, and belonging operate in a dialectical relationship that reflects both structural gender norms and individual negotiations within domestic life (Altman, 1975; Low & Altman, 1992).

Beyond these thematic lenses, age is a crucial variable shaping the interrelation of these concepts. Younger women, often engaged in waged labor and global cultural networks, seek greater autonomy and spatial flexibility, interpreting privacy and belonging less as seclusion and more as opportunities for self-expression (UN Women, 2020). Middle-aged women, balancing caregiving and economic contribution, experience privacy and personal space as contested resources within collective family life. Elderly women, by contrast, attach belonging more strongly to continuity, routine, and cultural traditions, often perceiving privacy less as exclusion and more as comfort derived from stable domestic arrangements. These genera-

tional variations demonstrate that privacy, personal space, and belonging are not static categories but are redefined over the life course.

Geography further conditions these dynamics. In rural areas, where extended families and porous domestic-agricultural boundaries dominate, women's privacy and personal space are constrained, and belonging is tightly bound to kinship and communal identity (Karakaya, 2018). In urban contexts, apartment living heightens concerns over visual and auditory privacy, while also intensifying the struggle for individualized spaces within standardized layouts (UN-Habitat, 2014). Here, belonging is often mediated by ownership status or the amenities of gated communities rather than interpersonal ties. Regional disparities thus illustrate that privacy, personal space, and belonging cannot be disentangled from broader socio-spatial contexts.

Taken together, this conceptual framework situates the study within an interdisciplinary dialogue that integrates feminist theory, environmental psychology, and architectural research. By foregrounding the intersections of gender, age, and geography, it establishes a basis for analyzing how women in Turkey articulate and experience the meanings of home in ways that diverge from dominant male-centered narratives.

Domestic Space in the Context of Gender

The home has long been regarded as more than a physical shelter; it is a cultural artifact that embodies social, symbolic, and emotional meanings. Rapoport (1969) describes the act of building a house as a cultural practice through which societal values are materialized in spatial form, while Heller (1995), Bowlby et al. (1997), and Mallett (2004) similarly emphasize the home as a locus of safety, intimacy, and belonging. Imamoğlu and Imamoğlu (1996) highlight that in the Turkish context, the home conveys symbolic meanings beyond its materiality, serving as a site where identities and values are enacted in daily life. From nomadic tents and traditional Turkish houses to modern apartments, domestic architecture has continuously reflected and reproduced gender roles (Erdaş & Özmen, 2019; Sungur, 2020).

Within patriarchal societies, the spatial organization of the home has historically encoded gendered boundaries. Courtyard walls, latticed windows, and the segregation of *haremlik* and *selamlık* spaces institutionalized women's limited visibility and mobility while reinforcing cultural codes of modesty and propriety (Asatekin, 1994; Colomina, 1992). Massey (1994) further argues that space is not neutral but actively produced by power relations, including those of gender. Thus, domestic space operates as both a protective enclosure and a regulatory apparatus through which women's roles are defined, reproduced, and often circumscribed.

This framework brings into focus the intertwined concepts of privacy, personal space, and belonging, which collectively shape women's spatial experiences. Privacy, while often considered in functional terms, extends into a cultural code that enables women to regulate visibility, sound, and access within the domestic sphere (Altman, 1975; Low & Altman, 1992). Personal space represents the individualized territories women carve out for autonomy and self-expression. Yet, as Madigan and Munro (2002) and Hunt (1989) observe, women's personal spaces are frequently fragmented and improvised—corners of kitchens, balconies, or multi-use rooms—rather than stable, woman-defined territories. This lack of designated personal areas is not merely architectural but reflects broader inequalities in domestic power relations (Koçak Turhanoğlu & Beklan Çetin, 2023).

Belonging, in turn, encompasses both an affective attachment to home and the symbolic identification of women with domestic life. Scholars have shown that belonging is often reinforced by caregiving responsibilities and household labor, rendering the home simultaneously a site of identity affirmation and invisible work (Prost, 1992; Bora, 2011). Moreira and Farias (2022) emphasize that gendered forms of belonging manifest in how interiors are designed, decorated, and appropriated, often reinforcing cultural distinctions between “feminine” and “masculine” roles.

Importantly, these three dimensions—privacy, personal space, and belonging—are deeply interrelated rather than discrete. Privacy provides the

boundaries that make personal space possible; personal space, once established, becomes the foundation upon which belonging is cultivated. Conversely, when privacy is undermined, the ability to create personal space is compromised, and belonging risks becoming imposed rather than chosen. In this sense, domestic space functions as a dynamic arena where cultural expectations, gender ideologies, and individual negotiations intersect.

Finally, these dynamics are further shaped by age and geography. Younger women, often influenced by education and global cultural flows, seek flexible forms of privacy and belonging that prioritize autonomy, while middle-aged women must negotiate caregiving demands alongside their own spatial needs (UN Women, 2020). Older women, by contrast, attach belonging more strongly to continuity, routine, and tradition. Regional differences are equally significant: in rural settings, porous boundaries between domestic and agricultural spaces, as well as extended family living arrangements, constrain privacy and personal space, while belonging is closely tied to kinship and communal identity (Karakaya, 2018). In urban contexts, apartment living intensifies concerns over visual and auditory privacy, with belonging increasingly mediated through property ownership and the controlled environments of gated communities (UN-Habitat, 2014).

Taken together, the conceptualization of domestic space in the context of gender reveals that the home is not a neutral backdrop but a site of contested meanings. Privacy, personal space, and belonging form a triadic relationship through which women's identities and roles are continuously negotiated, shaped by both structural inequalities and the lived realities of age and regional context.

Methods

The primary aim of this study is to explore women's spatial experiences within the home, with particular emphasis on the concepts of privacy, personal space, and belonging. Age is considered a critical variable because it reflects differences in life stage, caregiving responsibilities, and

exposure to modernization, all of which shape domestic practices (Arnett, 2000; UN Women, 2020). Likewise, regional context is significant in Turkey, where urban and rural settings present markedly different patterns of housing typologies, family structures, and socio-cultural norms (Karakaya, 2018; Erdaş & Özmen, 2019). These two variables provide an essential lens for situating women's spatial experiences within broader socio-spatial dynamics.

Given the complexity of these interrelated factors, a qualitative research design was adopted. Qualitative inquiry is particularly suitable for uncovering the lived experiences and subjective meanings individuals assign to their environments (Creswell & Poth, 2018). The study employed descriptive analysis, which enables the systematic classification of qualitative data into thematic categories, thereby allowing for nuanced interpretation of participant narratives (Yıldırım & Şimşek, 2016). This approach made it possible to identify not only the general themes of privacy, personal space, and belonging but also the age- and region-specific variations embedded within these themes.

Sampling Strategy

The sample comprised 66 women aged between 20 and 80, residing in various geographical regions of Turkey. The initial plan was to recruit approximately 30–35 participants to ensure thematic saturation. However, during data collection, it became evident that generational and regional variations in women's experiences were highly pronounced. To capture these differences more comprehensively, the sample size was deliberately expanded to 66. This allowed for greater representation across age cohorts and urban–rural contexts, thereby enhancing the richness of the data. Participants were identified through the snowball sampling technique, a non-probability method whereby initial contacts referred other eligible women, ensuring diversity in terms of education, marital status, and occupation (Coşkun et al., 2019).

Data Collection

The research process began with a comprehensive review of existing literature, which informed the development of the interview guide. Semi-structured interviews were conducted, allowing participants the flexibility to elaborate on their experiences while ensuring consistency across responses (Creswell, 2021). The interview protocol covered four sections: demographic background, housing and surrounding environment, spatial usage patterns, and the personal meaning of home. A pilot study with 15 participants was carried out to refine the questions for clarity and relevance (Willis, 2015). Following this stage, interviews were conducted either face-to-face (for participants in Konya) or online (for those in other cities). With participants' consent, interviews were audio-recorded in addition to note-taking, allowing for careful re-examination during analysis.

Data Analysis and Coding Process

The collected data were analyzed through thematic descriptive analysis. First, transcripts were subjected to open coding, in which significant phrases and recurring ideas were identified. These initial codes were then grouped into broader thematic categories reflecting the study's conceptual framework—privacy, personal space, and belonging. To enhance reliability, two researchers independently coded a subset of transcripts. The inter-coder agreement rate was 85%, exceeding the threshold considered acceptable for qualitative research (Miles & Huberman, 1994). Discrepancies were resolved through discussion, ensuring analytical consistency. Thematic matrices were subsequently developed to compare findings across different age cohorts and regional contexts, thereby facilitating cross-case analysis.

Validity and Trustworthiness

Several strategies were employed to strengthen the validity and trustworthiness of the study. First, data triangulation was ensured by combining in-depth interview data with direct field observations

of participants' domestic environments. Observations were carried out in participants' homes during and immediately after the interviews, focusing on spatial arrangements, room usage patterns, and material elements that reflected participants' narratives (e.g., how balconies were adapted for privacy, or how kitchens functioned as semi-private retreats). In addition, with participants' consent, photographs of interior spaces were taken to document the physical setting. These images served as visual records that complemented field notes, enabling a richer understanding of spatial configurations and providing a basis for validating participants' descriptions (Pink, 2013). Second, member checking was conducted with a subset of participants who were invited to review and comment on preliminary interpretations. This process helped confirm the accuracy of thematic findings while also incorporating participants' feedback into the analysis. Third, an audit trail was established through the systematic documentation of coding decisions, analytical procedures, and reflexive notes taken throughout the research process. Such detailed record-keeping enhanced the transparency and dependability of the findings, aligning with the trustworthiness criteria outlined by Lincoln and Guba (1985).

Taken together, these strategies—triangulation through interviews, observations, and photographs; member checking; and the maintenance of an audit trail—reinforced the study's methodological rigor and credibility, ensuring that the interpretations were both contextually grounded and analytically robust.

Ethical Considerations

Since the study involves women's experiences in the highly intimate setting of the home, special attention was paid to ethical safeguards. Participation was voluntary, and all participants signed an informed consent form prior to the interviews. Anonymity was ensured by replacing participants' names with codes, and identifiable details of residences were omitted from transcripts. Importantly, this research received ethical approval from the Ethics Committee of Selçuk University

(Approval No: 08/01, Date: 25/06/2025). All procedures adhered to institutional guidelines as well as the principles of confidentiality and respect for participants' privacy.

Findings and Evaluation

The analysis of participants' narratives revealed three dominant thematic clusters: privacy, personal space, and the meaning of home. These themes emerged organically from the participants' responses and formed the foundation for the study's interpretive framework.

Demographic Findings

A total of 66 women participated in the study. In terms of age distribution: 33 participants (50%) were in the young cohort (20–49), 28 participants (42.4%) were middle-aged (50–64), 5 participants (7.6%) were elderly (65+).

Table 1. Demographic Characteristics of the Participants

Participant No	City	Age	Marital Status	Education	Participant No	City	Age	Marital Status	Education
P 1	Gaziantep	39	Married	P. School	P 34	Bursa	26	Married	University
P 2	Konya	31	Single	University	P 35	Istanbul	49	Widow	High School
P 3	Konya	30	Married	University	P 36	Kırıkkale	67	Widow	P. School
P 4	Düzce	51	Married	S. School	P 37	Konya	55	Widow	P. School
P 5	Mugla	40	Married	High School	P 38	Gaziantep	50	Married	P. School
P 6	Sakarya	72	Married	P. School	P 39	Istanbul	62	Married	P. School
P 7	Konya	52	Married	P. School	P 40	Izmir	53	Married	P. School
P 8	Konya	51	Married	P. School	P 41	Ankara	28	Married	University
P 9	Antalya	27	Single	University	P 42	Manisa	26	Single	University
P 10	Konya	63	Married	P. School	P 43	Konya	29	Married	P. School
P 11	Isparta	63	Married	P. School	P 44	Istanbul	50	Married	P. School
P 12	Istanbul	59	Widow	High School	P 45	Konya	25	Married	P. School
P 13	Istanbul	25	Single	University	P 46	Istanbul	48	Married	University
P 14	Istanbul	51	Married	High School	P 47	Istanbul	77	Married	P. School
P 15	Konya	41	Married	P. School	P 48	Ankara	30	Married	P. School
P 16	Ankara	27	Married	University	P 49	Ankara	52	Married	High School
P 17	Konya	73	Married	None	P 50	Düzce	56	Married	High School
P 18	Antalya	68	Single	P. School	P 51	Eskişehir	46	Married	S. School
P 19	Istanbul	26	Single	University	P 52	Ankara	52	Married	P. School
P 20	Balıkesir	54	Married	S. School	P 53	Konya	45	Married	P. School
P 21	Eskişehir	56	Married	P. School	P 54	Afyon	52	Married	High School
P 22	Konya	56	Married	University	P 55	Eskişehir	54	Married	P. School
P 23	Konya	23	Single	High School	P 56	Çanakkale	55	Married	University
P 24	Mersin	49	Married	High School	P 57	Istanbul	26	Married	P. School
P 25	Antalya	44	Married	High School	P 58	Burdur	35	Married	P. School
P 26	Sakarya	49	Married	University	P 59	Mugla	53	Married	University
P 27	Izmir	40	Married	P. School	P 60	Konya	37	Married	P. School
P 28	Balıkesir	47	Widow	P. School	P 61	Antalya	50	Married	High School
P 29	Konya	50	Married	High School	P 62	Istanbul	46	Married	High School
P 30	Konya	44	Married	University	P 63	Balıkesir	26	Single	University
P 31	Ankara	53	Married	High School	P 64	Eskişehir	62	Widow	High School
P 32	Konya	44	Married	P. School	P 65	Eskişehir	58	Married	P. School
P 33	Konya	52	Married	University	P 66	Isparta	44	Married	P. School

This distribution suggests a strong representation from younger and middle-aged women, offering a dynamic range of lived experiences. In terms of geographic distribution, the participants resided in various cities, including: Konya (18 participants; 27.3%), İstanbul (11 participants; 16.7%), Ankara (6

participants; 9.1%), others from cities such as Eskişehir (7.6%), Antalya (6.1%), and Balıkesir (4.5%). This diversity enhances the generalizability of the findings beyond a single regional context. Regarding marital status: 78.7% identified as married, 12.1% as single, 9.09% as widowed. In terms of motherhood, the highest proportions of participants reported having: Three children (39.3%), two children (22.7%), ten participants (15.1%) reported having no children. Educational backgrounds were as follows: primary school graduates (39.3%), high school graduates (27.2%), university graduates (27.2%), secondary school graduates (4.5%), one participant was illiterate (1.5%). Occupationally, the majority were: housewives (n = 40; 60.6%), followed by teachers (15.1%) and workers (4.5%). The predominance of housewives in the sample is significant, as it reflects a demographic that is extensively embedded within the domestic sphere—thereby offering rich insight into everyday spatial practices and gendered experiences at home (Table 1).

Housing and Surrounding

The majority (86.3%) lived in city centers, while 13.6% resided in suburban or rural areas. Housing typologies included apartments (65.1%), gated communities (18.1%), and detached houses (16.6%). Ownership status was split between own-

ers (60%) and tenants (40%). These housing conditions significantly influenced women's sense of control and belonging: homeowners frequently articulated stronger attachments to their dwellings, while tenants described their homes in more functional and temporary terms.

Spatial Usage Patterns

The spatial practices of participants within the home were found to be closely linked to their gender and the gendered roles they fulfill in domestic life. When asked, *"Which room(s) in your home do you spend the most time in?"*, participants frequently cited more than one location. The most frequently mentioned spaces were: kitchen (n = 53), living room (n = 43), sitting room (n = 43), balcony (n = 33), bedroom (n = 1), study (n = 1). Focusing solely on their primary space of activity, the results were as follows: kitchen: 36 participants (54.5%), living room: 14 participants (21.2%), sitting room: 10 participants (15.1%), bedroom: 4 participants (6.06%), children's room: 1 participant (1.5%), study: 1 participant (1.5%). These findings indicate that the kitchen is the dominant domestic space for most participants—a result that reflects the persistence of traditional gender roles, particularly those associated with caregiving and domestic labor such as cooking and cleaning. This trend is especially pronounced among homemakers, who spend the majority of their time in the kitchen engaging in food preparation, dishwashing, and other repetitive household tasks. In contrast, women who are employed outside the home tend to spend more of their domestic time in the living or sitting room, using these spaces primarily for rest and social interaction following long work hours.

Illustrative Participant Quotes on Spatial Usage:

- *"As a homemaker, I spend a lot of time in the kitchen and the sitting room. I especially enjoy being in the kitchen. The rest of my time is spent in the living room watching films, playing with my cat, or reading."* (Participant 3, Konya-30)
- *"I spend most of my time in the kitchen doing chores like cooking and washing dishes. I also spend a lot of time in the sitting room watching*

TV or doing embroidery." (Participant 4, Düzce-51)

- *"The living room is where I spend most of my time. It's where I sit with my relatives, neighbors, and children. But since I enjoy cooking, the kitchen comes second."* (Participant 22, Konya-56)
- *"I spend most of my day in the kitchen—cooking, cleaning, and washing dishes. Over time, I've come to enjoy lingering there."* (Participant 65, Eskişehir-58)

Another question asked was: *"What is your favorite activity at home and in which room do you usually perform it?"* Participants often mentioned multiple rooms in response. The most frequently cited spaces for engaging in pleasurable or meaningful activities were: living room/sitting room: 80.3%, kitchen: 65.1%, balcony: 39.3%, workshop: 1.5%, study: 1.5%. The most common activity mentioned across all spaces was watching television, followed by cooking, drinking tea or coffee, doing handicrafts or knitting, spending time with children or grandchildren, sewing, and reading.

Illustrative Participant Quotes on Activities and Spaces:

- *"I love caring for my plants. I keep them in the living room and kitchen. I even use my balcony like a garden."* (Participant 40, İzmir-53)
- *"Cooking brings me joy. I spend half of my day in the kitchen."* (Participant 54, Afyon-52)
- *"Sewing is like therapy to me. I do it in the sitting room, kitchen, or on the balcony."* (Participant 7, Konya-52)
- *"I grow vegetables on my balcony and read the Qur'an on the couch in the kitchen."* (Participant 18, Antalya-68)
- *"As a working woman, making breakfast in my kitchen on weekends makes me very happy."* (Participant 61, Antalya-50)
- *"I love baking börek and stuffed vine leaves. I also enjoy watching football—especially Galatasaray games—in the sitting room."* (Participant 6, Sakarya-72)
- *"We usually eat together in the living room after work. We clean up, chat, and sometimes watch a movie. I'd say 90% of my time is spent in that room."* (Participant 13, İstanbul-25)

- *"I enjoy doing embroidery on the balcony during summer evenings while sipping tea."* (Participant 4, Düzce-51)
- *"There's a soft light in my sitting room. I turn it on, light candles, and watch TV shows with my husband while drinking tea or coffee. It's one of my favorite activities."* (Participant 19, İstanbul-26)
- *"I love sitting on my ground-floor balcony, working with soil, and planting things. My second favorite space is the living room, where I relax and watch Netflix."* (Participant 3, Konya-30)
- *"My kitchen balcony has a great view. My husband and I sit there and drink tea. When my grandchildren visit, we play games together."* (Participant 10, Konya-63)
- *"Cooking and sewing are my passions. I also enjoy crafting, so I spend a lot of time in the kitchen and the living room."* (Participant 14, İstanbul-51)
- *"Reading books is my favorite thing to do. I sit in the armchair in front of my bookshelf in the study and lose myself in the pages."* (Participant 48, Ankara-30)



Figure 1. Participant 10's Balcony image and Participant 48's living room image

These statements demonstrate that the spaces women occupy and enjoy most are not solely determined by function, but are also shaped by emotional attachments and sensory comfort. The kitchen, living room, and balcony emerge as both functional and affective spaces—reflecting broader gendered patterns in spatial appropriation and domestic identity.

Findings Regarding Personal Space, Privacy and Belonging Themes at Home

Personal Space: Most participants reported that they did not have a dedicated room of their own.

Instead, 34.8% stated that they had improvised personalized niches within shared domestic environments—such as balcony gardens, sewing corners, or multi-use workshop areas. This finding underscores the gendered imbalance of spatial allocation, where women must negotiate autonomy within collective spaces.

Age-based differences were striking. Younger women (20–49), particularly those engaged in paid employment, emphasized the need for flexible and door-separable areas, such as study corners or convertible living-room zones, to balance leisure and hybrid work demands. Middle-aged women (50–64), positioned between caregiving obligations and personal aspirations, frequently adapted kitchens and balconies into semi-private retreats that enabled short moments of solitude. Elderly women (65+) relied on terraces or familiar corners, treating them as extensions of routine and comfort, thereby reinforcing continuity and stability.

Regional context also shaped personal space practices. Urban women, constrained by limited apartment sizes, tended to create fragmented multi-functional micro-territories—a reading nook in a corner, a hobby desk in the living room, or a kitchen balcony turned into a retreat. In contrast, rural and semi-urban women appropriated outdoor extensions—gardens, courtyards, or verandas—as personal domains, where seasonal activities such as gardening or tea gatherings allowed them to reclaim autonomy.

"I studied fashion design and enjoy sewing. There's an empty room next to my bedroom, which I've turned into a studio. I added a desk, my sewing machine, and some drawers. Eventually, I'd like to install a bookshelf for my books." (Participant 45, Konya-25)

"I've set aside a part of the sitting room for handicrafts. It's a space where I can relax and also earn some income by selling what I make." (Participant 1, Gaziantep-39)

"With six children and a 2+1 home, the kitchen is the only space I can really call my own." (Participant 38, Gaziantep-50)

"I decorated the terrace with flowers I love. They're like my children. The terrace is entirely my own creation and brings me peace." (Participant 25, Antalya-44).

These findings show that personal space is commonly improvised and fragmented, varying with

age (flexibility and expression among younger women, semi-private retreats among the middle-aged, and routine comfort for the elderly) and with geography (indoor micro-territories in urban contexts, outdoor extensions in rural areas). This confirms the study's claim that standardized housing layouts inadequately accommodate women's differentiated spatial needs.

Privacy

The theme of privacy is discussed separately as visual privacy, auditory privacy and olfactory privacy. Visual privacy emerged as a near-universal concern across participants. Women expressed discomfort at the thought of their home interiors being visible from the street, regardless of whether this was actually the case. Strategies such as closing curtains, installing blinds, applying window films, or building courtyard walls were commonly reported. For younger women (20–49), visual privacy was tied to autonomy and self-expression, enabling them to relax, socialize, or work at home without feeling exposed. Middle-aged women (50–64) emphasized guest-related visibility problems, particularly the absence of transitional hallways separating public and private zones. Elderly women (65+) associated visual privacy with comfort and routine, describing practices like “always keeping curtains closed” as ingrained habits.

Regional differences were significant. Urban women, living in densely packed apartments, were most concerned with overlooking neighbors and street-level exposure. Rural and semi-urban women, by contrast, stressed courtyard walls, fences, or vegetation as tools for controlling visibility, especially in houses with porous boundaries.

“We don't have a night corridor, so my younger daughter's room is right next to the living room. That bothers her. Also, from the living room, guests can see into the kitchen, which makes me feel constantly observed.” (Participant 20, Balıkesir-50)

“I always close the bedroom doors when guests arrive. I host them in the living room—I do not want private areas visible.” (Participant 14, İstanbul-51)

“If guests come, I close the door to the night corridor to block the bedrooms from view—it helps me feel more comfortable.” (Participant 33, Konya-52)

“Guests can access any room in my home, except the bedroom.” (Participant 61, Antalya-50)

“Guests who want to smoke on the balcony must pass through my bedroom, which really makes me uncomfortable.” (Participant 63, Balıkesir-26)

“Due to a lack of rooms, I host female guests in the children's room and male guests in the living room. A hallway would make things much easier.” (Participant 56, Çanakkale-55)

Participants unanimously agreed that the idea of their home interiors being visible from the street would cause discomfort, regardless of whether this was actually the case. This reaction highlights not just a physical concern but also the emotional and cultural dimensions of privacy. Measures such as drawing curtains, erecting walls, or planting trees were interpreted as acts of spatial boundary-making. Additionally, several women reported that visual privacy was not merely individual but also enforced through family norms, especially by male household members.

“I always close the curtains. I can't explain why, but I feel uneasy otherwise. The trees in front of our building help too.” (Participant 65, Eskişehir-58)

“Of course, it would bother me. My husband is especially strict about this, and now it's become a habit for me as well.” (Participant 33, Konya-52)

“When we moved in, we could see into our neighbor's home and vice versa. It felt invasive. We had a wall built around the garden. It helped a lot.” (Participant 54, Afyon-52)

“We had the balcony glass filmed and covered with blinds to prevent visibility from outside.” (Participant 29, Konya-50)

“I'm lucky. Our home isn't visible from the outside, and that gives me peace of mind.” (Participant 16, Ankara-27)

“Even though we live on the 11th floor, the possibility of being watched is still disturbing.” (Participant 22, Konya-56)

“Yes, absolutely. Privacy is important for us. That's why our curtains are always closed.” (Participant 62, İstanbul-46)

Auditory privacy was also a major concern, though perceptions varied. Many participants complained of noise from neighbors, street sounds, or traffic, reporting discomfort and a lack of insu-

lation. Younger women (20–49) frequently described noise as disruptive, particularly in urban apartments, where loud music or conversations from next-door units compromised relaxation or remote work. Middle-aged women (50–64) emphasized the stress of constant noise layered onto caregiving responsibilities, often noting that the home failed to provide a restorative environment. Elderly women (65+) were more ambivalent: some described external sounds as invasive, while others interpreted them positively, framing neighborhood noise as a sign of vitality and social life. Urban contexts amplified complaints about auditory privacy, with participants often highlighting poor insulation as a structural flaw of apartment living. In rural and semi-urban settings, while noise from neighbors was less pressing, sounds from agricultural activities or workshops nearby were occasionally noted as sources of disturbance.

"There's no soundproofing in the walls. I can hear every word from the next apartment. It's extremely disturbing." (Participant 44, İstanbul-50)

"Our home is on a busy street, so I hear cars, children playing, and my son's workshop downstairs. It's overwhelming." (Participant 18, Antalya-68)

"Our neighbor blasts music and yells at night. We hear their arguments too—it's very uncomfortable." (Participant 62, İstanbul-46)

"Sometimes there are noisy motorcycles or loud music outside, but it's not too bothersome." (Participant 4, Düzce-51)

"There are so many children in the neighborhood, the noise never stops. But it brings energy to the home—I don't mind it." (Participant 54, Afyon-52)

"Our insulation is poor. I can hear conversations from both upstairs and downstairs neighbors." (Participant 49, Ankara-52)

Although less frequently mentioned than visual or auditory concerns, olfactory privacy (or protection from unwanted smells) was an important dimension of domestic well-being. Women described discomfort caused by external odors entering the home, including cigarette smoke from balconies, trash left in shared spaces, or plumbing issues in apartment buildings. Younger participants (20–49) were especially sensitive to cigarette smoke or cooking odors entering through shared balco-

nies. Middle-aged women (50–64) highlighted hygiene issues in common areas, such as poorly maintained trash disposal. Elderly participants (65+) reported smells from agricultural or animal activities, interpreting them as intrusive and diminishing comfort. Regionally, olfactory discomfort was far more pronounced in rural and semi-urban areas, where porous boundaries exposed homes to livestock odors or open-air waste. Urban women also noted problems, particularly in high-rise apartments where inadequate ventilation or plumbing issues spread unpleasant smells through shared infrastructure.

"We live in a detached home across from neighbors who raise chickens. Sometimes the smell is overwhelming." (Participant 10, Konya-63)

"I'm very bothered by the trash my neighbor leaves outside her door." (Participant 16, Ankara-27)

"There's no major issue, but when guests smoke on the balcony, the smell inevitably enters the house, and I hate it." (Participant 42, Manisa-26)

"The plumbing in our building gives off a terrible odor. Everyone complains, but management does nothing." (Participant 47, İstanbul-77)

These findings show that privacy is multidimensional, encompassing visual, auditory, and olfactory boundaries. Visual privacy is most critical in urban apartments and varies by age—from autonomy for younger women to routine comfort for the elderly. Auditory privacy reflects generational sensitivities, with younger women perceiving noise as disruptive and some older women framing it as social vitality. Olfactory privacy highlights structural and environmental inequalities, most acute in rural and semi-urban contexts. Together, these variations confirm that privacy is not a universal condition but a lived, context-specific negotiation shaped by age, geography, and cultural norms.

Belonging: Belonging emerged as one of the most consistent and symbolically charged themes across participants, revealing that the home is experienced as more than a physical shelter. In a multiple-response question regarding the symbolic and emotional functions attributed to their domestic space, the majority of women selected more than one definition: *"My home is where I feel safe"* (89.3%),

"My home is where I am together with my family" (78.7%), *"My home is a world that belongs to me and my family"* (72.7%), *"My home is where I find peace"* (71.2%), and *"My home is where I can live freely"* (65.1%). These results underscore the home's dominant role as a sanctuary, particularly for women, where safety, peace, and intimacy coalesce.

Security was interpreted not only as physical protection from intrusion but also as freedom from external judgment and social control. Participants consistently framed the home as an insulated, private realm enabling emotional safety, autonomy, and family intimacy. The emphasis on *"a world that belongs to me and my family"* highlighted how belonging is intertwined with ownership-informed privacy and symbolic control over boundaries. Peace was not reduced to the absence of noise, but extended to emotional calm and psychological renewal. Several women described the home as a therapeutic and restorative environment, where the burdens of public life could be temporarily suspended. Moreover, freedom was articulated as an advanced form of privacy—allowing women to express themselves, resist external judgment, and reassert control over their daily rhythms.

Only 6 participants (9.09%) defined the home primarily as an economic asset, suggesting a sharp disassociation between capitalist valuations of housing and women's gendered, embodied attachments. For these women, homeownership was not speculative but represented a symbol of identity, security, and necessity.

Younger women (20–49): Associated belonging with self-expression, autonomy, and sociability. Living and sitting rooms became spaces of leisure and independence, where they could assert personal identity within collective environments. Middle-aged women (50–64): Defined belonging through caregiving and invisible labor, often locating meaning in kitchens and balconies where household duties intersected with emotional attachment. For them, belonging was grounded in maintaining family routines and relational responsibilities. Elderly women (65+): Prioritized continuity, tradition, and comfort. Terraces, gardens, and familiar corners were cited as anchors of memory

and routine, reinforcing stability and intergenerational identity. Urban participants: Linked belonging strongly to ownership, security, and neighborhood identity. Apartment dwellers and gated community residents emphasized the symbolic role of property and protective amenities as markers of attachment. Rural and semi-urban participants: Rooted belonging in kinship ties, communal practices, and outdoor spaces, reflecting porous boundaries between domestic and social life. For these women, belonging was enacted through collective rituals, extended family ties, and community-based responsibilities.

These findings show that belonging is not an abstract sentiment but a lived, gendered practice: younger women frame it through autonomy and sociability, middle-aged women through caregiving and family routines, and older women through continuity and tradition. Regionally, urban women construct belonging through ownership and security, while rural women anchor it in kinship and communal life. Together, these results demonstrate that women's sense of home is inseparable from age and geography, confirming that domestic attachment is shaped more by cultural and existential meanings than by economic value.

Discussion

The findings of this study demonstrate that women's spatial experiences in Turkish apartments are deeply shaped by the negotiation of privacy, personal space, and belonging. These three themes reveal both continuities with traditional housing practices and significant shifts driven by modernization, socio-economic change, and evolving gender roles. Importantly, they also highlight how generational positions and regional contexts mediate the ways in which women appropriate and interpret domestic space.

Personal Space and Individualization: The narratives around personal space reflect a broader trajectory of modernization in Turkish housing. In extended family households of the mid-twentieth century, multifunctional rooms constrained individuality, consistent with Tuncer's (2002) observation that Turkish domestic architecture prioritized

collective needs. The emergence of separate bedrooms during the 1970s and 1980s, however, marked a turning point that supports Bozdoğan's (2001) argument that modernization introduced functional zoning into domestic life.

This study extends such accounts by demonstrating that personal space remains fragmented and improvised for many women in contemporary apartments. Younger women's appropriation of balconies and bedrooms as retreats for self-expression echoes Altman's (1975) and Madanipour's (2003) theories on the importance of semi-private spaces for fostering individuality. Middle-aged women's transformation of kitchens and balconies into semi-private refuges adds nuance to existing literature by highlighting how personal space is negotiated within caregiving responsibilities—an area underexplored in architectural studies. Elderly women's reliance on terraces and routine corners demonstrates continuity with traditional notions of stability and comfort, underscoring that personal space is not merely a modern invention but adapts across life stages.

Geographically, urban women improvised micro-territories within apartments, consistent with research on spatial fragmentation in high-density contexts (Foster & Judd, 2024). Rural women, however, relied on outdoor extensions—gardens, courtyards, terraces—to sustain individuality. This extends previous studies by showing that rural personal space is not only communal but also deeply gendered, allowing women to balance autonomy with visibility in outdoor domestic extensions.

Privacy and Gendered Boundaries : Privacy emerged as a central but evolving value. Older women emphasized the importance of spatial thresholds such as entrance halls, night corridors, and closed doors to maintain gendered boundaries within the home. This finding resonates with Massey's (1994) conceptualization of spatial segregation as a cultural practice that reinforces social order, as well as Spain's (1992) argument that domestic architecture historically positioned women as mediators of access between the public and private realms.

By contrast, younger participants associated privacy less with architectural thresholds and

more with **acoustic and technological solutions**—such as sound insulation, blinds, or surveillance systems. This indicates a shift from collective, culturally enforced forms of privacy toward individualized, techno-spatial forms of control. While this development aligns with recent scholarship on the personalization of domestic environments (Obeidat et al., 2025; Hammad et al., 2025), it also extends the literature by showing how this transition is uneven across age cohorts: older women rely on inherited practices of layered thresholds, whereas younger women adapt standardized apartments through material and technological interventions.

Regionally, urban participants reported intense concerns over visual and auditory privacy, consistent with findings on the pressures of high-density housing (Low & Altman, 1992). In rural and semi-urban contexts, however, privacy was negotiated primarily through access control and sensory comfort, reflecting porous thresholds and extended family living. This supports but also nuances earlier accounts (Güven Ulusoy & Üstün, 2019) by showing that traditional practices persist not only in communal courtyards but also in sensory boundaries shaped by environment and kinship.

Belonging and Spatial Identity: Belonging was expressed as a deeply gendered and emotional dimension of the home. The majority of participants described their home as a sanctuary of safety, peace, and intimacy, echoing Çelik's (1993) interpretation of the home as a site of cultural reproduction. Kitchens and living rooms maintained their role as anchors of collective identity, but women also identified balconies and terraces as symbolic spaces of comfort and personal affirmation. This finding aligns with Karaman and Erman's (2014) work on the significance of transitional spaces, and with Low and Altman's (1992) recognition of belonging as rooted in both social relations and physical boundaries.

Generational differences enrich these insights. Younger women's emphasis on freedom and autonomy in shared spaces extends the literature by framing belonging not solely as collective identity but also as self-expression. Middle-aged women's association of belonging with caregiving responsibilities reinforces Bora's (2011) observation that

women's identities are embedded in invisible labor, yet our data show how this role is spatially materialized in kitchens and balconies. Elderly women's reliance on terraces and routines confirms the endurance of tradition and neighborhood ties, linking belonging to continuity rather than autonomy.

Regionally, women in western cities highlighted individualized belonging rooted in ownership and security amenities, while participants from eastern and semi-rural areas emphasized kinship and communal courtyards. This duality supports existing research on the resilience of traditional practices (Güven Ulusoy & Üstün, 2019) but extends it by showing how modernization and socio-economic change fragment belonging into both individualized and collective trajectories.

Conclusion

This study examined women's spatial experiences in Turkey through the interrelated themes of privacy, personal space, and belonging, while paying particular attention to how these experiences vary across generations and regions. By conducting in-depth interviews with 66 women from diverse age groups and geographic contexts, the research provides a comparative perspective that goes beyond localized accounts, revealing how gender intersects with life stage and socio-spatial environment to shape women's relationship with the home.

The findings demonstrate that privacy, while a persistent cultural value, is enacted differently across ages and regions. Older women emphasized traditional thresholds such as entrance halls and corridors, echoing historical patterns of gendered boundary-making, whereas younger women increasingly relied on acoustic, visual, and technological strategies to safeguard autonomy within standardized apartments. Regionally, urban participants prioritized visual and auditory privacy, while rural and semi-urban women foregrounded access and olfactory comfort—extending privacy beyond visual control to a multi-sensory negotiation of domestic security.

Personal space was shown to be indispensable yet fragmented. Younger women sought flexible, door-separable niches that support autonomy and hybrid work-leisure practices; middle-aged

women carved semi-private zones in kitchens and balconies to balance caregiving with personal needs; elderly women rooted their personal space in terraces and routines that symbolized continuity. Urban participants relied on improvised micro-territories in limited apartments, while rural women used gardens and courtyards as extensions of autonomy. These findings extend the literature by highlighting how personal space is not only a function of housing typology but also deeply mediated by age-specific roles and regional conditions.

The theme of belonging revealed the strongest emotional attachment to the home. While kitchens and living rooms sustained their role as collective anchors, younger women framed belonging in terms of freedom and self-expression, middle-aged women linked it to caregiving responsibilities, and older women associated it with continuity and tradition. Urban women tied belonging to ownership and security, while rural women located it in kinship ties and communal practices. Crucially, only a small minority defined the home as a financial asset, underscoring that women's domestic attachment is driven less by economic value and more by emotional, cultural, and existential significance.

In terms of scholarly contribution, the study advances the literature by (i) offering a nationwide comparative lens that integrates regional variation into discussions of gendered domesticity, (ii) introducing age as a critical variable that differentiates how privacy, personal space, and belonging are experienced, and (iii) conceptualizing privacy not only as visual control but also as multi-sensory comfort encompassing auditory and olfactory dimensions. By situating women's narratives at the intersection of architecture, sociology, and cultural studies, the research extends earlier accounts of modernization and housing by showing how women actively reinterpret and negotiate space across life stages and contexts.

Building on these insights, the study recommends that housing design in Turkey incorporate gender-sensitive principles:

- Integration of transitional spaces (such as entrance halls or night corridors) that mediate public-private boundaries.

- Provision of individualized or adaptable areas that allow for autonomy, self-expression, and emotional recovery at all life stages.
- Attention to multi-sensory privacy by addressing visual, acoustic, and olfactory comfort through design and material strategies.
- Consideration of regional and generational diversity, recognizing that housing solutions must move beyond standardized typologies to reflect differentiated needs.

By addressing these dimensions, housing design can not only enhance women's daily well-being but also contribute to more inclusive, equitable, and context-aware domestic environments, thereby advancing the broader agenda of gender-sensitive architectural practice.

Declarations

Funding: No funding was received for conducting this study.

Conflicts of Interest: The author declares no conflict of interest.

Ethical Approval: This research was approved by the Ethics Committee of Selçuk University (Approval No: 08/01, Date: 25 June 2025).

Informed Consent: All participants provided written informed consent prior to the interviews. Anonymity and confidentiality were strictly maintained.

Data Availability: The datasets (interview transcripts, field notes, and visual documentation) generated and analyzed during the current study are available from the corresponding author on reasonable request.

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RESEARCH ARTICLE

Storytelling Elements as Success Factors in Award-Winning Advertising: A Mixed-Methods Analysis of D&AD Television Campaigns

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Abstract

The Design & Art Direction Awards represent one of the most prestigious competitions in advertising, art direction, and design, operating for 62 years in the UK and 37 years internationally. This study examines storytelling elements in advertisements that won the iconic "Black Pencil" and "Yellow Pencil" awards in the "TV and Cinema Advertisements" category, investigating whether storytelling serves as a factor in award recognition. The research applied content analysis to 69 award-winning television advertisements, quantifying storytelling elements through a coding form based on theories by Vogler, Booker, Propp, and Todorov. Data was analyzed using frequency analysis and independent samples t-tests with index variables. Results revealed that narrative advertisements (95.7%) won more awards than argumentative ones, as did those using humor (79.7%), containing characters (89.9%), featuring plot structure (87.0%), and incorporating conflict (73.3%). Difference tests demonstrated that storytelling elements do not vary according to sector, country, or time period, indicating universal applicability. The findings establish that narrative sophistication, rather than demographic targeting or temporal adaptation, drives creative recognition in advertising excellence. This study provides important indicators for agencies seeking D&AD Award success, demonstrating that classical storytelling principles transcend cultural and contextual boundaries in award-winning advertising.

Keywords: Advertising, Storytelling, D&AD, Advertising Design, Art Direction.

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Öz

Design & Art Direction Ödülleri, reklam, sanat yönetimi ve tasarım alanındaki en prestijli yarışmalar arasında yer alır ve İngiltere'de 62, uluslararası düzeyde 37 yıldır düzenlenmektedir. Bu çalışma, "TV ve Sinema Reklamı" kategorisinde "Siyah Kalem" ve "Sarı Kalem" ödülü kazanmış reklamlardaki hikaye anlatımı unsurlarını inceleyerek, hikaye anlatımının ödül kazanmada bir etken olup olmadığını araştırmaktadır. Araştırmada 69 ödüllü televizyon reklamına içerik analizi uygulanmış, Vogler, Booker, Propp ve Todorov teorilerine dayanan kodlama formu ile hikaye anlatımı unsurları sayısallaştırılmıştır. Veriler frekans analizi ve bağımsız örneklem t-testi ile analiz edilmiştir. Sonuçlar, anlatı içeren reklamların (%95.7) nedensel olanlara göre daha fazla reklamda kullanıldığını, mizah kullananların (%79.7), bir karakter içerenlerin (%89.9), bir senaryo yapısı olanların (%87.0) ve çatışma barındıranların (%73.3) daha fazla ödül aldığını göstermiştir. Fark testleri, hikaye anlatımı unsurlarının sektör, ülke ve zamana göre değişmediğini, evrensel uygulanabilirlik gösterdiğini ortaya koymuştur. Bulgular, demografik hedefleme veya zamansal adaptasyondan ziyade anlatı sofistikasyonunun reklam mükemmeliyetinde yaratıcı tanınma sağladığını göstermektedir. Çalışma, D&AD veya benzeri bir yaratıcılık odaklı ödül hedefleyen ajanslar için önemli göstergeler sunmaktadır.

Anahtar Kelimeler: Reklam, Hikaye Anlatımı, D&AD, Reklam Tasarımı, Sanat Yönetimi

Introduction

"Each of us has a story inside. Storytelling is a natural component of society and culture. Story depends on language and is transmitted through contemporary tools... Each generation of every culture has taken advantage of the tools available to them and developed their own storytelling methods" (Frazel, 2010).

Storytelling has been an inseparable part of life since humans began transferring observations to cave walls. These first narrative attempts found new expansion areas through language and developed media channels, continuing today in different formats by incorporating images and videos (Benjamin, 2006). Advertising represents one of the primary ways stories and narratives are transmitted, appearing as pervasively in our lives as stories themselves (Weilbacher, 1984; Jenkins, 2006).

However, not all advertisements present themselves through stories. Advertisements can appear in narrative style or argumentative form. While argumentative advertisements offer instructive propositions about product appeal, narrative-style advertisements present stories related to product consumption moments (Munch, Boller, & Swasy, 1993). Research establishes that narrative advertisements are more persuasive, evoke more positive emotions, cause fewer negative cognitive responses, and create favorable brand attitudes (Escalas, Moore, & Britton, 2008; Green & Brock, 2000).

The Nielsen Global Trust in Advertising Survey found that consumers trust recommendations from their peers far more than direct advertising, suggesting a need for brands to adopt a friendlier discourse through experience-sharing and storytelling (Nielsen, 2012; Fog, Budtz, Munch, & Blanchette, 2010). This aligns with well-established theories explaining *why* storytelling is so persuasive. When an individual becomes immersed in a story, they are mentally "transported" into its world, a state that can temporarily lower critical skepticism and foster a more positive attitude toward the embedded message or brand (Green & Brock, 2000; Petty & Cacioppo, 1986). It is this power to captivate and persuade that often separates merely functional advertising from true creative excellence.

While the creative process in advertising can often feel mysterious (Sasser & Koslow, 2008), organizations like D&AD provide a tangible benchmark for excellence, seeking work that is built on a "brilliant idea," demonstrates "excellent execution," and is "relevant to the subject matter" (D&ADa, 2025). Examining the narrative elements within these award-winning campaigns, therefore, offers a unique opportunity to uncover the patterns of creative success.

Given that an integrated, quantitative analysis of narrative theories has not previously been applied to a prestigious sample like the D&AD awards, this study adopts an exploratory research design. Rather than confirming or falsifying a pre-existing model, its primary objective is to map this "creative terrain." By analyzing the presence, frequency, and interplay of elements from various narrative theories, this research aims to build a foundational understanding for future, more focused inquiry. To achieve this, the study will first explain structuralist models (the skeleton of the narrative), archetypal models (the actors), and thematic models (the content), before presenting findings on the extent to which these elements feature in award-winning advertising.

Structures Shaping Narrative in Advertising

The success of an award-winning advertisement depends not merely on a brilliant idea, but equally on how this idea is packed to resonate with the audience (Richards & Curran, 2013). This process revolves around two fundamental elements: advertising appeals that target the audience's emotional and rational motivations, and advertising execution styles that transform these appeals into concrete narratives (Babacan, 2015). These two components determine whether an advertisement becomes merely an informative announcement or an engaging story that draws viewers in (Barnard, 2005).

Advertising Appeals: The Emotional and Cultural Anchors of Narrative

Advertising appeals serve as strategic tools that define which values and emotions a brand wishes

to be associated with in the audience's mind (Aaker & Myers, 1975). These appeals may address universal human emotions or draw upon specific cultural codes.

Universal Emotional Appeals

Advertising appeals carry values and motivations determining advertising's main message, making products attractive by connecting them with emotions (Moriarty et al., 2018). The most frequently employed appeals in advertising typically exist along rational and emotional axes (Brennan & Binney, 2010). For the scope of this study, seven fundamental emotional appeals stand out (Becan, 2014):

- ***Humor***: Aims to establish a positive connection with the brand by making the audience laugh. It incorporates elements of surprise, exaggeration, or absurd situations.
- ***Freedom***: Appeals to desires for individualism, adventure, and exploration. This approach appears particularly often in automobile or travel advertisements.
- ***Happiness***: Centers warm emotions such as family, love, and tranquility, positioning the brand as trustworthy and genuine.
- ***Fear***: Highlights a problem (such as security vulnerabilities or social exclusion) and presents the brand as the solution to this problem. Insurance or hygiene product advertisements exemplify this approach.
- ***Social Status***: Transforms the brand into an object of desire through concepts of luxury, success, and privilege.
- ***Sexuality***: Uses elements of beauty and physical attractiveness to capture attention and evoke desire.
- ***Fantasy***: Aims to make the brand unforgettable by surprising viewers with surreal and magical elements.

Appeals Based on Cultural Values

Advertisements reflect the culture in which they emerge. Hofstede's cultural dimensions provide a

powerful framework for understanding how appeals may differ across various societies (Mooij, 2019):

- ***Power Distance***: In cultures where hierarchy matters (high power distance), advertisements emphasize themes such as respect for elders or expert opinions, while egalitarian (low power distance) cultures favor more individualistic and anti-authoritarian themes.
- ***Individualism/Collectivism***: In individualistic cultures, "I"-focused advertisements emphasizing personal achievement (such as "Because I'm worth it") prove effective, while collective cultures prefer "We"-focused narratives highlighting family and social harmony.
- ***Masculine/Feminine Values***: Advertisements in cultures with "masculine" values like competition, achievement, and winning tend to be more assertive and ostentatious. In cultures where "feminine" values such as compassion, modesty, and quality of life predominate, softer and relationship-oriented narratives are employed.
- ***Uncertainty Avoidance***: In cultures with high uncertainty avoidance, advertisements provide rational assurances such as scientific evidence, detailed product information, and expert opinions. In opposite circumstances, result-oriented, more metaphorical and ambiguous narratives can be effective.

Advertising Execution Types

Execution styles determine the format in which the appeals are presented to the audience. Whether an advertisement becomes a boring "lesson" or an engaging "drama" depends on the chosen execution style (Franzen, 1994; Mooij, 2009). The primary styles include:

- ***Announcement***: This represents the most basic style, focusing on providing information about the product. It typically follows a simple structure where the product is displayed or its features are listed.
- ***Lesson***: This style presents direct arguments to persuade the audience. It encompasses formats where a presenter speaks, user testimonials are shared, or product demonstrations show how

something works. This style directly tells the audience "You should buy this product because..."

- **Drama:** In this style, the message is conveyed indirectly through a story. It includes dialogue between characters, slice-of-life scenarios, or problem-solution narratives. The audience occupies the position of an external witness observing events.
- **Entertainment:** Its primary purpose is to entertain the audience. It establishes an emotional connection between the brand and audience using humor, music, or show elements. The message is embedded within the entertainment.
- **Association Transfer:** This enriches the brand's meaning through an associated person (such as celebrity endorsement), lifestyle, or metaphor. For example, advertisements comparing a sports car's speed to a predatory animal exemplify this style.
- **Imagination & Special Effects:** This aims to visually impact the audience and make the narrative more memorable by using surreal visuals, animation, and advanced cinematic techniques.

In conclusion, the creative genius of an award-winning advertisement lies in the synergy between selecting the right appeal and bringing this appeal to life through the execution style that will most profoundly affect the target audience (Brierly, 2001). This study aims to reveal how these structures come together in D&AD award-winning advertisements to tell universal and timeless stories.

An Integrated Perspective on Narrative Theories: Structures, Archetypes, and Themes

Narratives have served as fundamental means of transmitting our experiences, values, and culture throughout human history (Brooks, 1992). Whether in fairy tales, films, or advertisements, stories captivate, educate, and connect us to one another. Yet what makes a story effective? Narrative theorists seeking to answer this question have examined the underlying structures, character archetypes, and thematic depths that define compelling

storytelling. This study aims to provide a comprehensive perspective on narrative theory by bringing together the contributions of prominent thinkers such as Christopher Vogler, Tzvetan Todorov, Vladimir Propp, Christopher Booker, and Aristotle. While exploring the distinct perspectives each theorist brings to the narrative world, we will also examine comparisons and interactions between these models. The goal is a better understanding for the complex nature of storytelling and reveal the fundamental elements of effective narratives.

The Anatomy of Narrative - Structuralist Models

Structural models that form the backbone of narratives help us understand how stories are constructed and what impact they have on audiences and readers. Two prominent figures in this field are Christopher Vogler and Tzvetan Todorov.

Christopher Vogler and The Hero's Journey

Christopher Vogler developed "The Hero's Journey" model by adapting Joseph Campbell's monomyth concept to modern storytelling. This model presents a universal narrative pattern in which a hero departs from the ordinary world, faces challenges, undergoes transformation, and returns changed. Vogler's 12-stage journey follows the story's flow and character development step by step:

- **Ordinary World:** The familiar, conflict-free environment where the hero exists at the story's beginning.
- **Call to Adventure:** An event or situation that will draw the hero from their ordinary world.
- **Refusal of the Call:** The hero's initial state of avoiding or fearing the adventure.
- **Meeting the Mentor:** The emergence of a guide who will provide the hero with guidance, knowledge, or tools.
- **Crossing the Threshold:** The hero's departure from the ordinary world and step into the unknown.
- **Tests, Allies, and Enemies:** The challenges, allies, and adversaries the hero encounters in the new world.

- **Approach to the Inmost Cave:** The hero's approach to the dangerous place where they will face their greatest fear.
- **The Ordeal (Death and Rebirth):** The moment when the hero faces the greatest challenge, confronts death, and undergoes transformation.
- **Reward:** The gain or knowledge the hero obtains after the ordeal.
- **The Road Back:** The hero's journey back to the ordinary world, often filled with new dangers.
- **Resurrection:** The hero's final and greatest test before returning to the ordinary world, a final purification.
- **Return with the Elixir:** The hero's return to their ordinary world transformed, with new insight or an "elixir" to share.

Vogler's model describes a structure frequently seen in Hollywood films and popular narratives. By emphasizing the character's internal and external journey, it enables the audience to identify with the hero and grow alongside them (Vogler, 1992).

Todorov and Narrative Equilibrium

Todorov analyzes narratives through concepts of equilibrium and disequilibrium. According to his theory, every narrative consists of five stages:

- **Equilibrium:** The state at the story's beginning where everything is orderly and normal.
- **Disruption:** The emergence of an event or conflict that disturbs this equilibrium.
- **Recognition:** Characters or the situation recognizing and confronting the disequilibrium.
- **Attempt to Restore Equilibrium:** Characters taking action to eliminate the disequilibrium.
- **New Equilibrium:** The establishment of a new equilibrium state at the story's end, though this new equilibrium typically differs from the initial one; characters and the world have changed.

Todorov's model emphasizes narrative's fundamental dynamics—the emergence and resolution of a problem. This model simply yet effectively explains stories' cyclical nature and characters' transformation throughout this process (Todorov, 1975).

Vogler and Todorov: A Comparative View

While Vogler and Todorov's models approach narrative structures from different angles, they complement each other. Vogler's "Hero's Journey" focuses more on character personal development and adventure, while Todorov's equilibrium model reveals the story's general flow and plot's fundamental logic. Each of Vogler's stages can fit within Todorov's equilibrium and disequilibrium transitions (Ryan, 2007). For instance, "Call to Adventure" and "Crossing the Threshold" correspond to Todorov's "Disruption" phase, while "The Ordeal" and "Resurrection" can be evaluated within "Attempt to Restore Equilibrium." Both models demonstrate that stories are not random sequences of events but possess specific internal logic and flow. Vogler details more of an archetypal journey, while Todorov offers a more abstract and universal structural framework. Considered together, these two theories provide powerful tools for understanding both a story's external plot and the character's internal transformation.

The Players of Narrative - Archetypal Models

Beyond the plot that forms narratives' foundation, characters serve as elements that advance the story and give it meaning. Vladimir Propp, through his detailed work on folk tales, systematically analyzed characters' functions and roles. Propp's "Morphology of the Folktale" suggests that characters in tales can be viewed as "functions" performing specific actions. These functions are essential building blocks necessary for story progression (Prince, 2003).

Propp identified seven basic character roles (or functions) that recur in fairy tales (Propp, 1968):

- **Villain:** The person or force that initiates conflict in the narrative, harming the hero or other characters (Example: the wolf in Little Red Riding Hood).
- **Donor:** The person who offers the hero a magical object, knowledge, or help, usually after the hero passes a test (Example: the fairy who gives Cinderella her dress).
- **Helper:** The character who physically assists the hero on their journey, carries them, or

provides support (Example: the animals in The Bremen Town Musicians).

- **Princess and Father:** Usually the person who needs rescuing (princess) and the authority figure who provides the reward for this rescue (father). The princess may be the target of the hero's quest (Example: Rapunzel and the king).
- **Dispatcher:** The person who sends the hero on a mission, giving them a quest order (Example: the king sending the prince on a mission).
- **Hero:** The central character of the story; the person who goes on a quest, fights the villain, and usually wins the reward by rescuing the princess. Propp divides the hero into two types: the "victim hero" who is directly exposed to the villain and the "seeker hero" who acts to rescue the villain's victims.
- **False Hero:** A character who initially appears to be a hero but whose true intentions or evil nature is revealed at the story's end (Example: jealous siblings in some tales).

Propp's character theory focuses on characters' functional roles within the story rather than their psychological depth. This approach has proven extremely effective in revealing universal patterns in fairy tales and similar narratives. According to Propp, a tale's basic structure emerges from these functions appearing in a specific sequence. This shows that while different tales may appear different on the surface, they share similarities in deep structure (Propp, 1968).

Propp's theory emphasizes that narratives consist not only of plot but also that specific character types and their actions play critical roles in story progression. This provides a powerful framework for story writers to use in character creation and plot construction, showing that characters should be evaluated not only by their individual characteristics but also by their contributions to the story's general flow.

The Meaning of Narrative - Thematic Models

Narratives are not merely a series of events or characters; they also carry deep meanings, universal themes, and insights into human experience.

Christopher Booker and Aristotle have approached these thematic and semantic dimensions of stories from different perspectives.

Christopher Booker and The Seven Basic Plot Models

In his book "The Seven Basic Plots," Christopher Booker argues that all stories in world literature can be reduced to one of seven basic plot patterns. Influenced by Jung's archetype theory, Booker contends that these patterns reflect universal conflicts and desires lying deep within human psychology. These seven basic stories are:

- **Overcoming the Monster:** The hero confronting and defeating a terrible threat (monster, evil force) (Examples: Dragon Slayer, David and Goliath).
- **Rags to Riches:** The hero rising from an initially poor or disadvantaged position to achieve success and wealth (Examples: Cinderella, Great Expectations).
- **The Quest:** The hero embarking on a long and difficult journey to find something or somewhere valuable (Examples: The Lord of the Rings, Indiana Jones).
- **Voyage and Return:** The hero going to an unknown world, experiencing adventures there, and returning changed (Examples: Alice in Wonderland, The Wizard of Oz).
- **Comedy:** A situation filled with misunderstandings, chaos, and absurdity that ultimately reaches a happy resolution (Examples: Shakespeare comedies, romantic comedies).
- **Tragedy:** The hero's decline due to a flaw or mistake, usually meeting a tragic end (Examples: Romeo and Juliet, King Lear).
- **Rebirth:** The hero falling under a bad influence, nearly dying or completely changing, and finally returning to goodness through rebirth (Examples: Beauty and the Beast, A Christmas Carol).

Booker's theory shows that stories represent not just a plot but also specific thematic and psychological depths. These models explain why stories are so universal and compelling by reflecting fundamental conflicts and solutions of human experience (Booker, 2004).

Aristotle and Poetics

Ancient Greek philosopher Aristotle's "Poetics" is one of narrative theory's oldest and most influential texts. By analyzing tragedy particularly, Aristotle explained a story's fundamental elements and how they come together to form a meaningful whole. According to Aristotle, a tragedy has four basic elements:

- **Plot (Mythos):** The story's most important element. The arrangement of events, a unity with beginning, middle, and end, connected by causal relationships. Aristotle emphasizes that the plot must be "whole," meaning every part must be related to each other and no part can be removed.
- **Character (Ethos):** People who advance the plot and shape the story with their actions. He notes that characters must be believable, consistent, and appropriate.
- **Thought / Conflict (Dianoia):** Themes, ideas, and arguments expressed through what characters say or think.
- **Diction / Message (Lexis):** The language, style, and expression of dialogue and narration.

Among these elements, Aristotle attributes central importance to plot. According to him, plot is a story's "soul," and all other elements serve the plot. A story's effectiveness comes from events following each other in a logical and necessary way. Aristotle's concept of "catharsis" (purification) also relates to the emotions of fear and pity that tragedy awakens in the audience; experiencing these emotions provides a kind of emotional purification (Aristotle, 1987).

Booker and Aristotle: A Comparative View

Booker and Aristotle show similarity in their focus on narratives' thematic and semantic depths, though their approaches differ. Aristotle offers a normative framework focusing more on a story's internal consistency, logical structure, and effect on the audience. For him, plot is a story's most fundamental and determining element. Booker, however, attempts to discover universal patterns and psychological archetypes underlying thousands of years of storytelling. While Aristotle's "Poetics"

serves as a guide for how tragedy should be constructed, Booker's work aims more at classifying existing stories and revealing their common themes.

Booker's seven basic stories can be viewed as different manifestations of Aristotle's plot concept. For example, Booker's patterns like "Overcoming the Monster" or "The Quest" are plots with beginning, development, and end stages containing conflict and resolution as defined by Aristotle. Both emphasize that stories are not random but carry specific order and meaning. While Aristotle emphasizes the story's internal logic and moral dimension, Booker focuses more on how stories reflect universal aspects of human experience. Considered together, these two thinkers show that narratives are not merely entertainment tools but powerful instruments for understanding human nature and universal truths (Abbott, 2008).

Design & Art Direction Awards (D&AD)

Design & Art Direction (D&AD) was established in 1962 by a collective of British designers and art directors, including David Bailey, Terence Dolovan, and Alan Fletcher, to celebrate creative communication excellence and elevate industry standards (D&ADa, 2025). The organization emerged from the "creativity revolution" of 1950s and 1960s American advertising, particularly influenced by pioneers like David Ogilvy and William Bernbach, with the Art Directors Club of New York serving as a primary inspiration (Nixon, 2003; Maguire, 1993).

Founding member Bob Gill articulated the organization's necessity: "When I came to England in 1960, I wondered why we couldn't find something similar to American advertising formations here. London had nothing comparable. So we thought we should do something" (D&AD, 2012). Initially formed as the Design and Art Direction Association of London (DADA) in 1962, it became D&AD in 1967 upon gaining international recognition (Design and Art Direction, 1967).

D&AD's legendary selectivity was evident from its inaugural 1963 ceremony, where among 2,500 submissions evaluated by 25 jury members, only one work received the coveted "Black Pencil

Award" while 16 earned "Yellow Pencil" recognition (D&AD Youtubeb, 2025). This rigorous approach established D&AD's reputation as "one of the most prestigious and difficult awards to win in design and advertising" (Nixon, 2015; Telegraph, 2025).

The organization awards five colored pencils representing different achievement levels: Black Pencil for groundbreaking creativity, Yellow Pencil for outstanding excellence, White Pencil for sustainable projects, Graphite Pencil for standout work, and Wood Pencil for best practices (D&ADb, 2025). With approximately 100 creative professionals serving as jury members across 13 specialized panels, D&AD maintains its institutional philosophy that "creativity makes us who we are" and continues fighting for creative excellence since 1962 (D&AD Youtubeb, 2025).

Research Methodology

Research Purpose and Methodology

This study examines the storytelling elements present in prestigious advertising awards, specifically focusing on D&AD's "Black Pencil" and "Yellow Pencil" awards, which provide unquestionable prestige to industry professionals worldwide. The research aims to identify common characteristics of narrative elements used in award-winning advertisements and create dialogue regarding storytelling layers by establishing an academic foundation through existing literature. Accordingly, an exploratory research methodology has been developed using systematic coding forms based on the theories and models outlined in the literature review.

While existing literature contains studies that have conducted content analysis of leading advertising awards for storytelling elements, these research efforts have remained limited to descriptive stages. An integrated and quantitative analysis of narrative theories on a creativity-focused sample such as D&AD has not been previously undertaken (Balci, 2019). Therefore, this study adopts an exploratory research design rather than a hypothesis-testing approach that aims to confirm or refute a particular model. The fundamental objective of

the study is to map the presence, frequency, and relationships of elements derived from different narrative theories in award-winning advertisements, thereby testing this 'creative ground' and establishing a foundation for more focused future research.

In this regard, the study seeks to transform content characteristics into quantitative data and present them to industry professionals, believing this approach will be meaningful both for incorporating international standards and groundbreaking work from the past into global advertising production, and for anticipating the creativity and execution standards that projects aiming for prestigious awards should achieve.

The research addresses the following questions:

- Has storytelling technique been utilized in the selected sample?
- If employed, how frequently does this occur, and does it contain sufficient intensity to serve as an award-winning force for advertisements?
- Which storytelling elements demonstrate frequent usage, and which do advertising professionals tend to avoid?
- Among storytelling elements, is there a distinctly overused element on a categorical basis (advertising appeals, advertising execution styles, narrative models - structuralist, archetypal, thematic)?

Research Design and Sample Selection

The study employs content analysis methodology to examine all advertisements that received D&AD's two most prestigious awards—"Black Pencil" and "Yellow Pencil"—in the "Television and Cinema Advertisements" category from the organization's international award inception in 1988 to the present. Data obtained through questions designed to identify storytelling elements were quantified using SPSS software to enable macro-level examination of the sample through frequency and percentage analysis.

Over the 36-year period since D&AD opened to international advertising and design community participation in 1988 (D&AD Youtubeb, 2025), among tens of thousands of applications in the

sample category, only 5 advertisements achieved "Black Pencil" recognition while 64 advertisements earned "Yellow Pencil" awards, totaling 69 advertisements. The advertisements were accessed through D&AD's digital archive and organized alphabetically by campaign name. When multiple versions of campaigns existed, they were treated as single units based on consistency in subject matter, messaging, and slogan, as well as their status as components of unified campaigns.

The research developed 19 questions organized into three primary sections:

- Basic Information: Campaign name, award year, advertiser brand, sector, agency, and slogan
- Appeal Elements: General advertising appeals, cultural advertising appeals, and execution style identification
- Storytelling Elements: Advertisement format, advertising appeals and execution types, narrative classifications

To ensure reliable evaluation of the coding framework incorporating specified models and theories, two independent coders first underwent training on the theoretical foundations and engaged in detailed discussions regarding convergent, divergent, and overlapping aspects of the coding categories. Following this preparation, both coders conducted individual coding work without disagreement on any advertisement. However, consensus discussions were required for two advertisements with particularly abstract narratives to determine appropriate narrative categorizations.

Reliability and Validation

Initial pre-testing with two academic coders on 20 advertisements (28.98% of the sample) yielded a Cohen's Kappa reliability coefficient of 0.807. Subsequent testing with additional coders on 25 advertisements (36.23% of the sample) achieved a Cohen's Kappa of 0.760, indicating acceptable inter-coder reliability according to established academic standards. Individual question reliability ranged from 0.324 to 1.000, with most questions achieving acceptable reliability thresholds. The overall Cohen's Kappa of 0.760 demonstrates that the coding

instrument provides reliable and meaningful advertisement evaluation capabilities.

Throughout the study processes, Treadwell's seven-step content analysis methodology guided the research design (Treadwell, 2013). Data collected from each storytelling measurement question were uploaded to SPSS version 23.0 for quantitative transformation and analysis.

To ensure research transparency and reproducibility, all materials including responses from both coders, primary coder data used in analysis, SPSS output files, detailed listings of the 69 advertisements in the sample, and the complete coding framework have been made publicly available through a GitHub repository under Creative Commons licensing for examination by interested researchers and practitioners (<https://shorturl.at/qk1Yp>).

Data Analysis and Findings

The categories discussed within the scope of the research model were applied to 69 advertisements, and the statistical summaries of the questions in the coding form directed to each advertisement are as follows.

Descriptive Statistics

Table 1. Awarded advertisements through the years

<i>Frequency Distribution of Examined Advertisements According to 10-Year Periods (n=69)</i>	<i>f</i>	<i>%</i>
1998-2007	38	55.1
1988-1997	17	24.6
2008-2024	14	20.3
Total	69	100

Award-winning advertisements are concentrated between 1998 and 2007 at 55.1%. This decade proved more productive and efficient for winning awards in the "Television and Cinema Advertisements" category, more than doubling the success rate of the first and last decades. Notably, no award-winning advertisements were found from 1988-1994 or 2015-2024. The years 2001, 1997, and 2003 were the most productive for D&AD Award success.

Table 2. Duration of advertisements

<i>Frequency Distributions of the Examined Advertising Durations (n=69)</i>	<i>f</i>	<i>%</i>
60-119 sec.	34	49.3
120 + sec.	19	27.5
30-59 sec.	14	20.3
0-29 sec.	2	2.9
Total	69	100

D&AD award-winning advertisements show a clear preference for longer formats, with 49.3% lasting 60-120 seconds and an average duration of 99.01 seconds. This suggests that award-winning creative work requires sufficient time to develop compelling narratives.

Table 3. Brands in examined advertisements by industry

<i>Frequency Distribution of Brands in Examined Advertisements by Industry (n=69)</i>	<i>f</i>	<i>%</i>
Fast Moving Consumer Goods	20	29.0
Media	15	21.7
Apparel and Accessories	11	15.9
Automotive	6	8.7
Industry and Services	4	5.8
Other (IT)	4	5.8
Healthcare	3	4.3
Entertainment	2	2.9
Telecommunications	2	2.9
Banking & Finance	1	1.4
Logistics	1	1.4
Total	69	100

Fast Moving Consumer Goods (29.0%), Media (21.7%), and Apparel and Accessories (15.9%) dominate the award-winning categories.

Table 4. Origin of advertisements

<i>Distribution of Examined Advertisements by Countries Designed (n=69)</i>	<i>f</i>	<i>%</i>
United Kingdom	31	44.9
United States of America	28	40.6
Australia	4	5.8
France	3	4.3
Holland	2	2.9
Sweden	1	1.4
Total	69	100

The UK leads with 44.9% of awards, followed by the US at 40.6%. Together, these countries account for 85.5% of all awards, with only six countries represented total.

Table 5. Type of advertising awards

<i>Frequency of Reward Types in Examined Advertisements (n=69)</i>	<i>f</i>	<i>%</i>
Yellow Pencil	64	92.8
Black Pencil	5	7.2
Total	69	100

Over 30 years, D&AD awarded only 69 prizes in this category, confirming its exceptional selectivity. The 92.8% Yellow Pencil rate versus 7.2% Black Pencil demonstrates the extreme rarity of achieving the highest recognition.

Advertising Appeals and Execution Styles

Table 6. Attractiveness elements in advertising

<i>Distribution of Examined Advertisements by Countries Designed (n=69)</i>	<i>f</i>	<i>% in All Attractive-</i>	<i>% in All Ads</i>
Humor	55	29.3	79.7
Freedom	35	18.6	50.7
Happiness	27	14.4	39.1
Social Status	24	12.8	34.8
Fantastic	19	10.1	27.5
Fear	16	8.5	23.2
Sexuality	12	6.4	17.4
Total	188	100	272

Universal appeal elements show humor as the dominant strategy (79.7%), followed by freedom (50.7%) and happiness (39.1%). These results indicate that award-winning advertisements prioritize emotional engagement and positive associations over negative appeals like fear (23.2%) or sexuality (17.4%).

Table 7. Hofstede's elements of attractiveness in advertising

<i>Frequency of Hofstede Attractiveness Elements in the Examined Advertisements (n=69)</i>	<i>f</i>	<i>% in All Attractive-</i>	<i>% in All Ads</i>
Individualism	47	30.3	68.1
Pleasure Pursuit	41	26.5	59.4
Female / Male Roles	31	20.0	44.9
Power Distance	18	11.6	26.1
Short / Long Term Perspective	14	9.0	20.3
Uncertainty Avoidance	4	2.6	5.8
Total	155	100	224

Cultural appeal elements reveal individualism (68.1%) and pleasure pursuit (59.4%) as primary strategies. Given that 85.5% of the awarded advertisements originate from the UK and USA, this finding reflects the Western cultural values that

predominate in D&AD recognition. However, this cultural influence appears selective rather than comprehensive—other Western cultural dimensions show markedly different patterns, with uncertainty avoidance appearing in only 5.8% of advertisements, power distance in 26.1%, and long-term perspective in 20.3%. This selective application suggests that award-winning creativity gravitates toward specific Western values that translate effectively across cultural boundaries, particularly those emphasizing individual agency and experiential satisfaction, while avoiding cultural dimensions that might limit universal appeal or create cultural barriers for global brands.

Table 8. Execution style of advertisements

Frequency of Execution Styles in Examined Advertisements (n=69)	f	% in All Attractive- ness	% in All Ads
Association Transfer	56	29.2	81.2
Entertainment	51	26.6	73.9
Drama	48	25.0	69.6
Special Effects	26	13.5	37.7
Imagination	6	3.1	8.7
Lesson	4	2.1	5.8
Announcement	1	0.5	1.4
Total	192	100	278

Association transfer (81.2%), entertainment (73.9%), and drama (69.6%) dominate execution styles. Significantly, argumentative approaches like announcements (1.4%) and lesson (5.8%) are virtually absent, confirming that award-winning creativity favors narrative and emotional approaches over direct persuasion.

Table 9. Form of advertisements

Frequency of Ad Form Types in Analyzed Ads (n=69)	f	%
Narrative	66	95.7
Argumentative	3	4.3
Total	69	100

The significant preference for narrative form (95.7%) over argumentative (4.3%) reinforces that storytelling is fundamental to award-winning advertising. This near-universal adoption suggests narrative structure is essential for creative recognition.

Findings Related to Narrative Theories

The Anatomy of Narrative - Structuralist Models

Table 10. The Todorov plot in advertisements

Frequency of Occurrence of the Todorov Plot in the Analyzed Advertising Stories (n=69)	f	%
None	21	30.4
Journey to Another World	11	15.9
The Biter-Bit	11	15.9
The Stranger Savior	8	11.6
The Solving of the Riddles	7	10.1
Rise and Fall	5	7.2
The Quest	4	5.8
The Beast Transformed by Love	1	1.4
Redemption	1	1.4
Total	69	100

While 30.4% of advertisements don't follow Todorov's plot structures, the remainder utilize recognizable patterns. "Journey to Another World" and "The Biter-Bit" (both 15.9%) are most common, suggesting award-winning advertising often employs escapism or empowerment narratives.

Table 11. Stages of Vogler's "Author's Journey" in advertising

Frequency of Occurrence of Vogler's "Author's Journey" Stages in Examined Ads (n=69)	f	% in All Attractive- ness	% in All Ads
Call to Adventure	35	13.6	51.5
Reward	35	13.6	51.5
Crossing the Threshold	33	12.8	48.5
Tests, Friends, Enemies	33	12.8	48.5
Ordinary World	33	12.8	48.5
Ordeal	30	11.7	44.1
Ruler	19	7.4	27.9
Approach	13	5.1	19.1
None	7	2.7	10.3
Meeting the Mentor	7	2.7	10.3
Rejection of the Call	6	2.3	8.8
Path to Return	4	1.6	5.9
Resurrection	2	0.8	2.9
Total	257	100	377

Vogler's "Hero's Journey" stages appear frequently, with "Call to Adventure" and "Reward" both at 51.5%. The high occurrence of foundational stages like "Ordinary World" (48.5%) and "Crossing the Threshold" (48.5%) indicates that award-winning advertising successfully establishes narrative context and character motivation.

Table 12. Scenes of Vogler's "Author's Journey" in advertising

Frequency of Occurrence of Vogler's "Author's Journey" Scenes in Analyzed Ads (n=69)	f	% in All Attractive-ness	% in All Ads
Scene 1: Departure	50	34.5	72.5
Scene 3: Initiation	39	26.9	56.5
Scene 2: Collapse	30	20.7	43.5
Scene 4: Return	19	13.1	27.5
None	7	4.8	10.1
Total	145	100	210

Scene analysis shows "Departure" (72.5%) dominates, encompassing initial narrative setup through the character's commitment to action. "Initiation" (56.5%) follows, covering the character's trials and growth. This pattern suggests award-winning advertising excels at establishing compelling beginnings while varying in resolution approaches.

The Players of Narrative - Archetypal Models

Table 13. Propp's character types in advertisements

Frequency of Execution Styles in Examined Advertisements (n=69)	f	% in All Attractive-ness	% in All Ads
Hero (Protagonist)	52	34.2	75.4
Villain (Antagonist)	43	28.3	62.3
Donor	17	11.2	24.6
Helper	16	10.5	23.2
Dispatcher (Operator)	9	5.9	13.0
None	8	5.3	11.6
False Hero	6	3.9	8.7
Princess and the father	1	0.7	1.4
Total	152	100	220

Propp's character analysis shows hero in 75.4% of advertisements and villain in 62.3%. The prevalence of these archetypal roles confirms that award-winning advertising employs classic narrative structures. Supporting characters like donors (24.6%) and helpers (23.2%) appear less frequently but remain significant.

The Meaning of Narrative - Thematic Models

Aristotelian analysis reveals that virtually all advertisements contain core narrative elements: message (98.6%), character (89.9%), plot (87.0%), and conflict (73.9%).

Table 14. Aristotelian narrative elements in advertising

Frequency of Aristotelian Narrative Elements in the Examined Advertisements (n=69)	f	% in All Attractive-ness	% in All Ads
Message	68	28.1	98.6
Character	62	25.6	89.9
Plot	60	24.8	87.0
Conflict	51	21.1	73.9
None	1	0.4	1.4
Total	242	100	350

Only one advertisement lacked these elements entirely. This demonstrates that classical storytelling principles underpin contemporary award-winning advertising.

Table 15. Level of conflict in advertising stories

Frequency of Propp Character Types in Analyzed Advertisements (n=69)	f	%
Minor Challenge	29	42.0
No Conflict	15	21.7
Ordinary World	13	18.8
Dilemma	6	8.7
Big Issues	6	8.7
Total	69	100

While 95.7% of advertisements use narrative form, conflict levels vary significantly. Minor challenges dominate (42.0%), while 40.5% of advertisements avoid conflict entirely by depicting ordinary worlds or having no conflict. This suggests that award-winning advertising often relies on subtle tension rather than dramatic confrontation.

Table 16. Booker's Seven Basic Story Model in advertising

Frequency of Occurrence of Booker's Seven Basic Story Models in the Analyzed Advertising Stories (n=69)	f	%
None	14	20.3
Defeating the Monster	13	18.8
Comedy	13	18.8
Quest	11	15.9
Rebirth	9	13.0
From Poverty to Riches	5	7.2
Tragedy	3	4.3
Journey and Return	1	1.4
Total	69	100

One-fifth of advertisements don't fit Booker's models, but "Defeating the Monster" and "Comedy" (both 18.8%) lead identifiable patterns. "Quest" narratives (15.9%) also feature prominently. These results indicate that award-winning

advertising gravitates toward empowerment, humor, and self-actualization themes that resonate universally with audiences.

Narrative Complexity Index & T-Test Results

Table 17. Index variables driven from the coded variables

Index Variable (n=69)	Min.	Max.	Mean	Std. Dev.	Range
Ad Attractiveness	0.14	0.71	0.389	0.181	0.57
Hofstede Attractiveness	0.17	0.83	0.374	0.188	0.66
Types of Ads	0.14	0.57	0.397	0.130	0.43
Aristotelian Elements	0.20	0.80	0.701	0.189	0.60
Character Types	0.13	0.50	0.275	0.110	0.37
Hero's Journey	0.06	0.89	0.323	0.205	0.83
Story Complexity	0.15	0.64	0.408	0.107	0.49

Award-winning advertisements most consistently employ classical narrative structure (message, character, plot, conflict). This suggests that fundamental storytelling architecture is essential for creative recognition. Despite their literary importance, specific character archetypes (hero, villain, donor) appear selectively. This indicates quality over quantity in character development rather than comprehensive archetypal casting. The Hero's Journey framework demonstrates the most diverse application, suggesting flexible adaptation of this model across different creative approaches.

Table 18. Independent samples T-Test results

Comparison (n=69)	Variables Tested	Significant Differentiation	p-Values	Key Finding
Country Origin (UK vs. Other)	All 7 Indices	None	0.513 – 0.937	0.181
Time Period (1988-2002 vs. 2003-2024)	All 7 Indices	None	0.292 – 0.658	0.188
Product Type (Goods vs. Services)	All 7 Indices	None	0.180 – 0.842	0.130

The results reveal a pattern of universal storytelling principles in D&AD award-winning advertising. Despite testing three fundamentally different categorical variables, no statistically significant differences emerged across any of the seven storytelling complexity indices. The absence of differences between UK and other countries (p-values .513-.937) is particularly striking given that UK and US productions dominate 85.5% of awards. This suggests that award-winning storytelling transcends national boundaries and cultural contexts. Rather than reflecting local creative traditions,

D&AD recognition appears to reward universal narrative principles that resonate across cultures. The lack of significant changes between 1988-2002 and 2003-2024 periods (p-values .292-.658) indicates that classical storytelling frameworks remain consistently relevant despite three decades of technological advancement, digital transformation, and evolving consumer behavior. This consistency suggests that fundamental human responses to narrative structure are stable and that award-winning creativity relies on enduring rather than trending storytelling approaches. The similarity between physical products and services (p-values .180-.842) demonstrates that effective storytelling strategies work regardless of offering type.

Discussion

This study's findings provide compelling evidence for the universality of narrative principles in award-winning advertising, yet several important limitations must be acknowledged. The analysis of 69 D&AD award-winning advertisements reveals that classical storytelling frameworks transcend cultural boundaries, technological changes, and product categories—a finding that challenges assumptions about the cultural specificity of creative excellence.

The dominance of Western countries (UK and US accounting for 85.5% of awards) raises questions about cultural bias in the sample. While the statistical analysis showed no significant differences in narrative complexity between UK and other countries, this geographic concentration may reflect D&AD's historical origins and judging panel composition rather than universal creative superiority. The organization's British roots and industry networks likely influence both submission patterns and evaluation criteria, potentially creating systematic advantages for English-speaking markets.

Temporal limitations also warrant consideration. The concentration of awards between 1998-2007 (55.1%) suggests this period represented either a golden age of television advertising creativity or reflects changing submission patterns and award criteria. The absence of awards from 1988-1994 and 2015-2024 may indicate shifts in creative

focus toward digital platforms not captured in our television-focused sample. This temporal clustering limits our ability to generalize findings across different advertising eras.

Conclusion and Implications for Further Research

This content analysis of 69 D&AD Black and Yellow Pencil award-winning advertisements from 1988-2024 reveals that creative excellence in advertising rests upon universal narrative foundations that transcend cultural, temporal, and categorical boundaries. The most significant finding demonstrates that award-winning storytelling operates according to fundamental principles rather than local adaptations or trending approaches.

Statistical analysis confirms narrative universality across all dimensions tested. Independent samples t-tests showed no significant differences between UK and other countries, across three decades, or between physical products and services on any storytelling complexity indices. This consistency indicates that D&AD recognition rewards fundamental narrative excellence rather than cultural specificity, temporal innovation, or product-adapted strategies.

The preference for positive emotional engagement over negative appeals (humor 79.7% vs. fear 23.2%) and narrative execution over argumentative approaches (95.7% vs. 4.3%) demonstrates that award-winning creativity builds connections through attraction and storytelling sophistication. Universal appeal elements showed stronger relationships with story complexity than cultural-specific appeals, suggesting globally resonant emotional strategies prove more critical for recognition than demographically targeted approaches.

Narrative models exhibit varying degrees of structural adoption. Aristotelian elements achieve near-universal implementation (message 98.6%, character 89.9%), while Vogler's Hero's Journey shows selective application (Call to Adventure 51.5%, Reward 51.5%) and Booker's thematic patterns appear in only specific contexts (Defeating the Monster 18.8%, Comedy 18.8%). This hierarchy indicates that basic storytelling architecture serves

as essential infrastructure, with more complex narrative frameworks providing strategic enhancement rather than foundational requirements.

Execution types reveal dramatic transformation from traditional advertising approaches. Association transfer (81.2%), entertainment (73.9%), and drama (69.6%) overwhelmingly dominate creative expression, while argumentative methods remain virtually absent (announcements 1.4%, lessons 5.8%). This pattern demonstrates that award-winning creativity has fundamentally shifted toward narrative engagement over direct persuasion.

The integration across these dimensions suggests that creative excellence emerges from sophisticated coordination: positive universal appeals provide emotional foundation, classical narrative structure ensures comprehensibility, and narrative execution styles deliver engaging presentation. This multi-layered approach distinguishes award-winning work from conventional advertising through strategic storytelling complexity rather than single-dimension innovation.

These findings challenge assumptions about creative cultural specificity while validating classical storytelling's enduring relevance in commercial communication. The consistency across technological transformation and cultural evolution indicates that fundamental human responses to narrative structure remain remarkably stable.

Future research should expand beyond Western award systems to validate narrative universality across Eastern contexts and examine regional variations in storytelling excellence. Digital platform analysis represents a crucial frontier, investigating how classical principles adapt to social media, streaming formats, and interactive technologies. Experimental studies examining audience response to specific narrative elements could provide empirical validation for theoretical relationships identified here. Longitudinal tracking extending beyond thirty years might reveal cyclical patterns while industry-specific analysis could determine whether specialized narrative approaches enhance creative recognition in particular sectors.

Declarations

Funding: No funding was received for conducting this study.

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Ethical Approval: This article does not involve any studies with human participants or animals conducted by the author. Therefore, ethical approval was not required.

Informed Consent: Not applicable.

Data Availability: The data analyzed in this study were obtained from the publicly accessible D&AD digital archive. All research materials, including coding forms, coder responses, SPSS outputs, and the full dataset of 69 advertisements, are openly available via a GitHub repository under a Creative Commons license (<https://shorturl.at/qk1Yp>).

AI Disclosure: No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.

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RESEARCH ARTICLE

The Effect of Ethnic Restaurant Visitors' Service Quality Perception on Repeat Purchase Intention and Customer Satisfaction: An Ethnic Restaurant Example*

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Abstract

Today, people see dining out as both a convenience and a fun opportunity. The desire to explore new experiences is also increasing interest in the food and beverage industry. With the impact of globalization, the desire to break away from daily routines, explore different cultures, and experience new things has increased interest in ethnic restaurants, particularly ethnic restaurants. These restaurants offer an authentic atmosphere by utilizing regional kitchenware and cooking techniques, allowing guests to learn about different cultures. The high-quality service offered by these establishments positively impacts customer satisfaction and repeat purchase behavior. This study aimed to meet the expectations and investigate the satisfaction levels of visitors to Turkish restaurants in Richmond, England. Data were collected through face-to-face surveys (July 7, 2023–September 7, 2023). The data were evaluated using correlation analysis, regression analysis, t-tests, and variance analysis. The findings indicate that service quality has a positive impact on customer satisfaction and repeat purchase intention. It has been determined that the impact of service quality on repeat purchases is largely due to customer satisfaction. Physical appearance is the most important service quality dimension, followed by reliability, assurance, and empathy. Consequently, businesses that improve service quality increase their likelihood of repeat purchases by achieving customer satisfaction. Developing various service quality components provides businesses with a competitive advantage. Therefore, identifying and addressing deficiencies across all dimensions is a key recommendation, positively impacting customer satisfaction and repeat purchase intentions.

Keywords: Ethnic restaurants, service quality, customer satisfaction, repeat purchase intention

Öz

Günümüzde insanlar dışarıda yeme içme deneyimini hem kolaylık hem de eğlence fırsatı olarak görmektedir. Farklı deneyimler keşfetme isteği de yiyecek-içecek sektörüne olan ilgiyi artırmaktadır. Küreselleşmenin etkisiyle birlikte toplumsal düzeyde günlük rutinden uzaklaşmak, farklı kültürleri tanımak ve yeni deneyimler yaşama arzusu, özellikle etnik restoranlara olan ilgiyi yükseltmektedir. Bu restoranlar bölgeye özgü mutfak araç-gereçleri ve pişirme tekniklerini kullanarak otantik bir ortam sunmakta ve misafirlerin farklı kültürler hakkında bilgi edinmesine olanak tanımaktadır. Bu işletmelerin yüksek kaliteli hizmet sunmaları müşteri memnuniyetini ve tekrar satın alma davranışını olumlu yönde etkilemektedir. Bu çalışmada İngiltere'nin Richmond ilçesindeki Türk restoranlarına gelen ziyaretçilerin beklentilerinin karşılanması ve memnuniyet düzeylerinin araştırılması amaçlanmıştır. Çalışma kapsamında yüz yüze yapılan anketler aracılığıyla veriler toplanmıştır (07.07.2023-07.09.2023). Elde edilen veriler korelasyon analizi, regresyon analizleri, t-testi ve varyans analizleri ile değerlendirilmiştir. Bulgular hizmet kalitesinin müşteri memnuniyeti ve tekrar satın alma niyeti üzerinde pozitif etkisi olduğunu göstermektedir. Hizmet kalitesinin tekrar satın alma üzerindeki etkisinin büyük ölçüde müşteri memnuniyetinden kaynaklandığı tespit edilmiştir. En önemli hizmet kalitesi boyutu olarak fiziksel görünüm ardından güvenilirlik, güvence ve empati gelmektedir. Sonuç olarak hizmet kalitesini artıran işletmeler, müşteri memnuniyetini sağlayarak tekrar tercih edilme olasılıklarını yükseltmektedir. Farklı hizmet kalitesi bileşenlerinin geliştirilmesi işletmelere rekabet avantajı sağlamaktadır. Bu nedenle tüm boyutlarındaki eksikliklerin belirlenip giderilmesi müşteri memnuniyetini ve tekrar satın alma niyetlerini olumlu şekilde etkileyerek önemli öneriler arasında yer almaktadır.

Anahtar Kelimeler: Etnik restoranlar, hizmet kalitesi, müşteri memnuniyeti, tekrar satın alma niyet

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Introduction

The concept of service appears in various forms at various stages of human life. As a crucial element for sustaining life, it has rapidly changed and diversified with social, economic, and technological developments since the 1700s (Uygur, 2007). This makes it difficult to determine the types and scope of services. While it is difficult to provide a clear definition of services due to their complex nature, the first historical terms were used by the Physiocrats in the 1750s to refer to all activities outside of agricultural production (Öztürk, 2006). While Adam Smith defined service in the 18th century as production without economic value (Aydın, 2010), Grönroos (1990) defined services as intangible activities that rely on human interaction to meet consumer expectations. According to Kotler (2003), services are defined as intangible and unclaimed actions, services, and gratifications that provide benefits in the communication between buyer and seller. Important responsibilities are undertaken in the provision and realization of services to individuals. Communication and psychological processes play a decisive role in this interaction (Timur, 2015). Accurate analysis of consumer needs by service providers plays an important role in improving service quality and customer satisfaction (Koçbek, 2015).

In an environment of constant changes in consumer attitudes and increasing competition, providing the highest service quality at the lowest cost is crucial for success (Cronin & Taylor, 1992). Research shows that in businesses offering high-quality service, costs stemming from poor quality can reach 30-40% of total costs (Öztürk, 2006). Businesses that focus on service quality not only reduce costs by providing high-quality service but also achieve a leading position in customer satisfaction (Tavmergen Pınar, 2002). In the literature, service quality is often defined as the quality perceived by the customer. This definition highlights the lack of tangible elements of services, such as physical products and the difficulty of objectively evaluating these products. Customers' assessment of service quality is crucial for businesses to meet their expectations and needs in a timely and complete manner (Vavra, 1999; Cevher, 2015).

Consumer value perception, particularly in the food and beverage industry, directly influences repeat purchase decisions. Therefore, businesses must determine how customers' perception of quality is shaped and its positive or negative consequences (Üzerem, 1997).

With the impact of globalization, people's eating and drinking habits have become more than just a basic need; they have also become important for social interaction and sharing. This has increased interest in ethnic restaurants, particularly as people seek to escape the ordinary and experience something different (Aksatan, 2017). Ethnic restaurants are considered social spaces that reflect cultural heritage and traditions, rather than simply serving local cuisine (Üzerem, 1997). To respond to this growing interest, business owners need to understand the factors that influence consumer value perceptions (Timur, 2015).

Ethnic restaurants offer their customers an "authentic cultural experience" by distinguishing themselves not only with their unique menus and service practices but also with their atmosphere and décor (Premordia, I., & Gál, T., 2023). In this context, menu descriptions may be in authentic language, or service personnel may serve customers in cultural attire. This reinforces some customer groups' sense of cultural belonging, while others satisfy their quest for exotic experiences (Gai, 2014). The literature emphasizes that the expectations and preferences of ethnic restaurant customers are shaped by the influence of different cultural contexts, and therefore, their perception of service quality may differ from that of standard restaurants (Premordia, I., & Gál, T., 2023).

The primary objective of this research is to evaluate the effects of service quality perceptions on customer satisfaction and repurchase intentions in ethnic restaurants. The aim of this study is to determine the differences in service quality, customer satisfaction and repeat purchase rates according to the demographic characteristics of the participants. Although numerous studies exist in the literature on service quality, customer satisfaction, and repeat purchases (Petzer & Mackay, 2004; Tsai et al., 2007; Aksu et al., 2016), comprehensive research on ethnic restaurants has not been con-

ducted. Therefore, this study is important in identifying shortcomings in the sector and contributing to the development of strategies to increase customer satisfaction.

In the literature, the relationship between customer satisfaction and repurchase intention is generally explained by the Expectation-Confirmation Theory (Oliver, 1980). According to this theory, the customer's pre-purchase expectations are compared with their post-service experience; if performance exceeds expectations, satisfaction occurs, and if this satisfaction is high, repurchase intention is strengthened. Furthermore, within the framework of the Theory of Planned Behavior (Ajzen, 1991), customer attitudes, norms, and perceived behavioral control determine their intentions. For example, a high level of satisfaction will develop a positive attitude, which in turn will increase repurchase intention (Lau et al., 2019). The SERVPERF or SERVQUAL models can be used to measure service quality; these models explain quality by addressing dimensions of service such as reliability, tangibles, empathy, and insecurity (Parasuraman et al., 1988).

This study was conducted on customers who visited Turkish ethnic restaurants in the Richmond district of southwest London, England. Today, there is a growing interest in ethnic restaurants, which facilitate interaction with different cultures and offer consumers the opportunity to experience regional cuisine far removed from the mainstream (Koçbek, 2015). While past migration movements have influenced the proliferation of ethnic restaurants (Park, 2017; Ma & Hsiao, 2020), the expansion of global tourism networks and people's desire to learn about different cultures and try new flavors also play a significant role (Jones, 1977). According to Euromonitor International's 2023 report, London is the second most popular tourist destination in the world with 18.8 million visitors and continues to attract tourists with its history, rich culinary culture, and extensive green spaces (Euromonitor International, 2023). Richmond, transferred to London in 1965 (Trammell & Terrell, 2017), welcomes many tourists every year with its Thames River, Richmond Park, the 14th-century

Church of All Saints, and the Royal Botanical Gardens at Kew, a UNESCO World Heritage Site

(Be Richmond, 2024). The borough was named the happiest place to live in England by Rightmove's 2023 Happy at Home Index, with over 26,000 respondents (Rightmove, 2023). Among the cafes and Michelin-starred restaurants along the Thames, venues such as Sebastian's Italian, Rincon Bar Espanol, Buenos Aires Argentine Steakhouse, and Turkish-origin Mada Anatolian Turkish Restaurant, Istanbul Barbecue Teddington, Pirzola Turkish Restaurant, Bade Turkish Restaurant, and Uncle Jim's Kebab offer the opportunity to experience different cultures (Tripadvisor, 2024). According to a 2017 report by the Trust for London, Richmond boasts the lowest poverty rate, highest education levels, and highest quality of life. Located along the River Thames, Richmond stands out as a tourist destination and offers exotic cultural experiences, making it a popular tourist destination (Be Richmond, 2024). Literature suggests that customers interested in ethnic restaurants are generally culturally oriented, have high incomes, and possess a high level of education (Cevizkaya, 2015). The primary reason for conducting this study in Richmond is its rich diversity of attractions.

This study contributes to the literature in four aspects: (i) It is one of the first studies to test the SERVQUAL → Satisfaction → Repurchase Intention chain via mediation within the Expectation-Confirmation Theory (ECT) framework in the context of ethnic restaurants; (ii) It demonstrates the full mediating role of satisfaction by decomposing the dimension-level effects of SERVQUAL into its direct and indirect components; (iii) In an environment where diaspora and unique cultural cues are abundant, such as Turkish ethnic restaurants in London, the findings quantitatively reveal the indirect effect of "authenticity and physical atmosphere" codes on repurchase intention; (iv) The results provide a prioritizable way for managers to prioritize which quality dimensions of investment produce higher returns through satisfaction.

Conceptual Framework

The Concept of Ethnic Restaurants and Consumer Behavior

Ethnic restaurants are establishments that emphasize the perception of "authenticity" through their

menu, service practices, and atmosphere, offering a taste of a specific culture's culinary identity.

This context shapes customers' expectations and perceived value differently from standard restaurants; motivations such as cultural affiliation, curiosity/desire for novelty, and displaying social identity can influence purchase decisions. When the perception of authenticity is supported by décor, music, language, and menu descriptions, satisfaction and behavioral intentions can be strengthened (Tsai & Lu, 2012).

Service Quality Perception (SERVQUAL/SERVPERF Dimensions)

Service quality is the customer's multidimensional evaluation of service performance. Two common approaches in the literature are SERVQUAL (expectation-perception gap; reliability, responsiveness, assurance, empathy, tangibles) and SERVPERF (perceived performance only) (Parasuraman et al., 1988). In the restaurant context, physical setting/atmosphere, service interaction, and food-related elements are the primary components of quality perception, and their holistic impact is reflected in customer outcomes (Brady & Cronin, 2001; Ryu et al., 2012).

Customer Satisfaction

Satisfaction is an affective-cognitive evaluation related to the degree to which the experienced performance meets or exceeds expectations. Within the framework of Expectation-Confirmation Theory, as the level of confirmation increases, so does satisfaction (Oliver, 1980). It has been reported in the restaurant literature that service and food quality, along with the atmosphere, increase satisfaction, and that satisfaction is a direct determinant of behavioral outcomes (revisit/recommend) (Ryu et al., 2012).

Repurchase Intention

Repurchase intention is the customer's subjective tendency to repurchase the same product/service in the future and is one of the most proximal indicators of actual behavior. According to the Theory

of Planned Behavior, intention is influenced by attitude, subjective norm, and perceived behavioral control (Ajzen, 1991).

Intention, which is positively influenced by service quality and satisfaction, has frequently been shown to be related to indicators of loyalty and profitability (Zeithaml et al., 1996).

Theoretical Underpinnings of the Variables and Hypotheses

Theoretically, a chain of service quality → satisfaction → repurchase intention is expected. An increase in the perception of quality increases satisfaction, and increased satisfaction, in turn, strengthens repurchase intention. Furthermore, some quality dimensions (e.g., tangibles/atmosphere, empathy) may directly influence intention. Therefore, the study's hypotheses can be based on the following narrative logic: (i) Dimensions of quality increase satisfaction; (ii) Satisfaction increases repurchase intention; (iii) Some quality dimensions may have an indirect effect through satisfaction, and in some cases, a direct effect (Zeithaml et al., 1996)

This study is based on the Expectation-Confirmation Theory (ECT) framework: perceived service quality (confirmation of expectation) determines satisfaction, which in turn drives behavioral intention (repurchase). Thus, the SERVQUAL dimension (stimulus) → Satisfaction (organismic evaluation) → Repurchase intention (response) chain forms the theoretical basis for our mediation hypotheses.

Literature Search Approach

A structured narrative review was used to map previous studies on ethnic restaurants, service quality (SERVQUAL/SERVPERF), customer satisfaction, and repurchase intention. The following keyword combinations were searched in Scopus and Google Scholar databases for the period 2010–2024: “ethnic restaurant,” “authentic dining,” “servicescape,” “service quality,” “SERVQUAL,” “SERVPERF,” “customer satisfaction,” “repurchase intention,” “revisit intention,” “food neophobia,” “food neophilia,” “acculturation,” and

“cultural congruence.” Peer-reviewed and empirical English articles on restaurant/hospitality were included; the articles on non-restaurant service areas and commentary/non-empirical were excluded. The resulting selection provides the theoretical basis for the study's ECT-based mediation model.

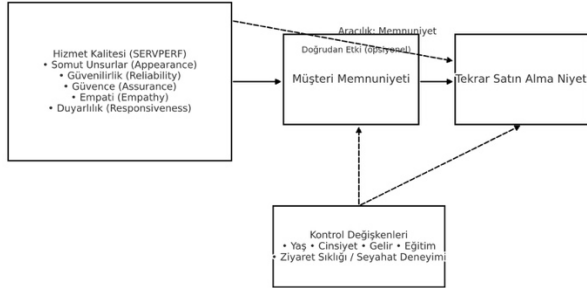


Figure 1. Service Quality → Customer Satisfaction → Repeat Purchase Intention

Methodology

Research Model

This study tests a mediation model based on Expectancy–Confirmation Theory (ECT). According to the model, perceived service quality—a latent construct conceptualized by the dimensions of Tangibles/Physical Appearance, Reliability, Assurance, and Empathy—initially increases customer satisfaction, and repurchase intention is primarily formed through this satisfaction channel. Therefore, the model tests the possibility of full/partial mediation by representing the paths from service quality → satisfaction and satisfaction → repurchase intention, as well as the potential direct effect of service quality → repurchase intention. In the context of ethnic restaurants, cues such as authenticity and servicescape (décor, menu language/symbols, music) are expected to enhance perceptions of quality, thus increasing satisfaction, which in turn is reflected in repurchase intention. The model is tested both at the composite service quality level and at the dimension level (Physical Appearance, Reliability, Assurance, Empathy). The theoretical flow is summarized in Figure 1, and the hypotheses developed within the framework of this structure were tested in the findings section.

This research is limited to visitors to a Turkish ethnic restaurant in the Richmond district of London between July 7, 2023, and September 7, 2023. Due to logistical constraints such as distance and cost, a population sampling method was used. The variables examined in the study were service quality perception (physical appearance, reliability, assurance, responsiveness), customer satisfaction, and repeat purchase behavior. After conducting a literature review on these variables, the primary data collection phase utilized face-to-face interviews and surveys. The main research topic is to examine the links between service quality perception and customer satisfaction and repeat purchase.

Research Hypotheses

The model tested in this section is a mediation model tested at both composite and dimension levels, testing the effect of perceived service quality, which includes physical appearance, reliability, assurance and empathy, on customer satisfaction and, when necessary, directly on repurchase intention, based on Expectancy–Confirmation Theory (ECT):

H1: Perception of service quality is predicted to significantly increase customer satisfaction. Perceived high service quality results in meeting (or even exceeding) customer expectations, which in turn increases satisfaction. For example, Ismoyo et al. (2017) showed that perception of service quality statistically significantly increases consumer satisfaction (Ismoyo et al., 2017).

H2: Perception of service quality is also assumed to have a positive effect on repurchase intention. In other words, when customers perceive the service as high quality, they are more likely to repurchase the same service in the future. For example, Ramadhani and Sukawati (2021) found that perceived service quality significantly increases customer repurchase intention on the Shopee platform (Ramadhani & Sukawati, 2021).

H3: Customer satisfaction has been suggested to have a positive effect on repurchase intention. It has been frequently emphasized in the literature that high satisfaction strengthens customers' tendency to purchase the same service again. Ismoyo et al. (2017) also found that as customer satisfaction

increases, repurchase intention significantly increases (Ismoyo et al., 2017).

H4: Customer satisfaction is assumed to indirectly mediate the effect of service quality on repurchase intention. In other words, service quality affects customer purchase intention to some extent through satisfaction. For example, Surjit (2019) showed in a study that the effect of service quality on customer loyalty is mediated by customer satisfaction (Surjit, 2019). Similarly, Ramadhani and Sukawati (2021) found that customer satisfaction significantly mediated the effect of service quality on repurchase intention (Ramadhani & Sukawati, 2021).

Population and Sample of the Research

The research population consisted of visitors to Turkish ethnic restaurants in London, the capital of England. Considering time and cost limitations, the comfort maneuver method was preferred for collecting data from distance in the research. This method aims to reach a specific time period or a specific location without any context between individuals (Ural & Kılıç, 2005; Kozak, 2014)

The Richmond district of London constituted the sample of the study. Participants who had visited multiple restaurants were asked to evaluate the surveys based on their most recent experience. No definitive data on the total number of restaurant visitors in London was available.

Based on the studies of Krejcie (1970), Sekaran (2003), and Yazıcıoğlu & Erdoğan (2014), a minimum of 385 participants was required for calculations with a 5% margin of error and a 95% confidence level, regardless of population size. In this context, a survey was conducted on a total of 398 people, 225 women and 173 men.

Data Collection and Validity and Reliability of the Research

The surveys prepared for the research model and hypotheses testing were selected to represent the population and were collected from individuals on a voluntary basis. The survey approach was selected to gather a large amount of data within a brief and concentrated timeframe. At the start of

the survey, participants were informed about the purpose of the research and were encouraged to respond honestly, reflecting their true opinions. The first section of the survey form used in the study included questions regarding service quality perception. For these questions, the SERVPERF service quality scale, developed by Cronin & Taylor (1994) to examine the relationship between service quality, customer satisfaction, and purchase intention, was used. The scale is composed of five dimensions: the physical environment, reliability, trust, prompt and friendly behavior, and empathy. Şirin (2016), in his study investigating the impact of service quality on customer satisfaction, repurchase, and recommendation tendencies in hotel businesses, conducted a pilot study with guests staying at 3-, 4-, and 5-star hotels in Ortahisar, Trabzon, in October 2015 to measure the reliability of the scale. The findings from these studies demonstrated that the overall internal consistency coefficient of the scale was $\alpha=0.945$, indicating that the scale is reliable and falls within acceptable reliability standards. The survey instrument employed in the study was developed to assess customers' perceived service quality of ethnic restaurants, incorporating the physical environment, reliability, trust, and empathy dimensions from the SERVPERF scale.

The second section of the survey included three items from the customer satisfaction scale developed by Oliver (1980, 1997), which was used in studies by Hellier et al. (2003) and Jin et al. (2015) to determine the satisfaction levels of ethnic restaurant customers. The reliability of this satisfaction scale was tested in a study by Jin et al. (2015), and the internal consistency coefficient, Cronbach's Alpha, was found to be 0.914.

The third section included a scale measuring ethnic restaurant visitors' repurchase intentions. This scale includes three items aimed at assessing customers' likelihood of repurchasing based on the restaurant's service quality and their satisfaction levels. To enhance the scale's reliability, a five-item questionnaire developed by field experts was supplemented with two reverse-coded items, and a reliability analysis was subsequently performed. In Levent's (2020) study examining the impact of repurchase intention on tourist consumers, the

scale's reliability was determined with a Cronbach's Alpha value of 0.702, confirming its reliability. The internal consistency rates of all measurements were found to be high and the following results were reached: Service Quality ($\alpha=0.91$); Physical Appearance ($\alpha=0.88$); Reliability ($\alpha=0.90$); Assurance ($\alpha=0.89$); Empathy ($\alpha=0.87$); Customer Satisfaction ($\alpha=0.92$); Repurchase Intention ($\alpha=0.89$). The surveys utilized a 5-point Likert scale, with response options arranged as follows: "1 = Strongly Agree," "2 = Agree," "3 = Neutral," "4 = Disagree," and "5 = Strongly Disagree."

Data Analysis

The data collected from the study were analyzed using IBM SPSS Statistics for Windows, Version 22.0 with the PROCESS macro software in a computer-based environment. To evaluate the data distribution within the scale, mean and standard deviation values were computed. Additionally, kurtosis and skewness values were examined to determine whether the study variables followed a normal distribution.

Table 1. Normal Distribution

	Kurtosis	Skewness
Service Quality	0,547	-0,354
Physical Appearance	0,695	-1,054
Reliability	0,369	-0,874
Assurance	0,748	-0,987
Empathy	0,968	-0,647
Customer Satisfaction	0,624	-1,014
Repurchase Intention	-0,551	0,114

Additional the literature, kurtosis and skewness values of variables within the limits of +1.5 to -1.5 (Tabachnick & Fidell, 2007) and +2.0 to -2.0 (George & Mallery, 2010) indicate that the data conform to a normal distribution. Based on these assessments, the variables were considered to follow a normal distribution. Consequently, parametric methods were employed for the data analysis. To examine the mediating effect among the continuous variables in the study, several statistical methods were applied, including Pearson correlation, linear regression, and hierarchical regression analysis. These analyses were conducted using PROCESS Model 4 in SPSS, created by Hayes (2013). This model allowed for the calculation of total, direct, and indirect effects, providing a detailed

understanding of how the mediating variable influences the relationship between the independent and dependent variables. The robustness of the findings was confirmed through a 95% confidence interval and 5000 bootstrap resamples, as referenced by Ayğar and Kaya (2017). Additionally, to explore differences in demographic data and scale scores, independent samples t-test, one-way ANOVA, and post-hoc tests such as Tukey and LSD were performed.

Findings

Findings Regarding Service Quality, Customer Satisfaction, Repurchase Intention Score Weights

The mean ratings for perceptions of Service Quality, Customer Satisfaction, and Repurchase Intention are shown in Table 2.

Table 2. Service Quality, Customer Satisfaction, Repurchase Intention Average Scores

	N	Mean	SD.	Min.	Maks.
Service Quality	398	4,250	0,634	1,590	5,000
Physical Apperance	398	4,357	0,748	1,000	5,000
Reliability	398	4,254	0,751	1,000	5,000
Assurance	398	4,273	0,636	1,500	5,000
Empathy	398	4,141	0,751	1,000	5,000
Customer Satisfaction	398	3,925	0,730	1,000	5,000
Repurchase Intention	398	3,208	0,873	1,000	5,000

The overall results suggest that participants generally expressed a high level of satisfaction with the quality of service provided. The aggregate mean score for the Service Quality dimension was found to be 4.250, with a standard deviation of 0.634. Within this dimension, the highest average was recorded in the Physical Appearance subdimension, which had a mean of 4.357 and a standard deviation of 0.748. The Reliability dimension received a mean score of 4.254 (SD = 0.751), while the Assurance dimension had an average of 4.273 (SD = 0.636). Conversely, the Empathy dimension obtained a comparatively lower mean score of 4.141, with a standard deviation of 0.751.

The average score for customer satisfaction was 3.925, with a standard deviation of 0.730. This suggests that, on the whole, participants were generally content with the services provided, although their satisfaction levels were slightly lower when

compared to perceptions of service quality. The average repurchase intention score was 3.208, accompanied by a standard deviation of 0.873, which is notably lower than the scores for the other variables.

Findings Regarding the Relationships Between Service Quality, Customer Satisfaction And Repurchase Intention Scores

Table 3 displays the findings from the correlation analysis that explores the connections among Service Quality, Customer Satisfaction, and Repurchase Intention scores. This analysis, which employed Pearson correlation coefficients along with significance testing, assesses both the intensity and the nature (positive or negative) of the relationships among these variables.

Table 3. Correlation Analysis Between Service Quality, Customer Satisfaction and Repurchase Intention Scores

		Service Quality	Physical Appearance	Reliability	Assurance	Empathy	Customer Satisfaction
Service Quality	r	1,000					
	p	0,000					
Physical Appearance	r	0,841**	1,000				
	p	0,000	0,000				
Reliability	r	0,885**	0,624**	1,000			
	p	0,000	0,000	0,000			
Assurance	r	0,865**	0,656**	0,743**	1,000		
	p	0,000	0,000	0,000	0,000		
Empathy	r	0,904**	0,672**	0,739**	0,686**	1,000	
	p	0,000	0,000	0,000	0,000	0,000	
Customer Satisfaction	r	0,802**	0,643**	0,668**	0,718**	0,767**	1,000
	p	0,000	0,000	0,000	0,000	0,000	0,000
Repurchase Intention	r	0,546**	0,449**	0,449**	0,466**	0,535**	0,674**
	p	0,000	0,000	0,000	0,000	0,000	0,000

<0,01; Pearson Korelasyon Analizi

The correlations in Table 3 are strong in magnitude ($r \geq 0.70$) and significant ($p < 0.01$). This pattern suggests that the SERVQUAL $\rightarrow$ Satisfaction link is strong, as expected, and that the path to repurchase intention is primarily shaped by satisfaction. The high correlations do not necessarily constitute evidence of causality; therefore, the study tested the theoretical chain with assumptions of causal directionality through regression and mediation analyses (see Sections 4.3–4.4).

When analyzing the associations between service quality and other variables, strong and statistically significant positive correlations were observed across all sub-dimensions. Notably, a very high correlation was identified between overall service quality and the Physical Appearance sub-dimension ($r=0.841$; $p<0.01$). Similarly, significant strong positive correlations were found between service quality and the other sub-factors: Reliability ($r=0.885$; $p<0.01$), Assurance ($r=0.865$; $p<0.01$), and Empathy ($r=0.904$; $p<0.01$). These findings suggest that the various components of service quality are closely interconnected. Additionally, a strong, positive relationship was detected between customer satisfaction and overall service quality ($r=0.802$; $p<0.01$). Significant positive correlations were also evident between customer satisfaction and the sub-dimensions of Physical Appearance ($r=0.643$; $p<0.01$), Reliability ($r=0.668$; $p<0.01$), Assurance ($r=0.718$; $p<0.01$), and Empathy ($r=0.767$; $p<0.01$). These findings suggest that aspects of service quality and customer satisfaction have a positive influence on the likelihood of repurchasing. The analysis of the link between repurchase intention and other factors showed a significant, positive correlation with Customer Satisfaction ($r=0.674$; $p<0.01$). Additionally, meaningful positive relationships were identified between repurchase intention and the sub-dimensions of Service Quality: Physical Appearance ($r=0.449$; $p<0.01$), Reliability ($r=0.449$; $p<0.01$), Assurance ($r=0.466$; $p<0.01$), and Empathy ($r=0.535$; $p<0.01$). Overall, these results highlight that participants' perceptions of service quality and their satisfaction levels contribute to increasing their intentions to buy again.

Regression Analysis Results Regarding the Findings Regarding the Effect Between Service Quality, Customer Satisfaction and Repurchase

Intention Scores

Table 4 presents the results of the regression analysis that explores the relationships and effects among service quality, customer satisfaction and repurchase intention scores.

Table 4. Regression Analysis Between Service Quality, Customer Satisfaction and Repurchase Intention Scores

Dependent Variable	Independent Variable	β	SE	t	p	%95 CI Lower	%95 CI Upp
CS	SQ (a)	0,802	0,035	26,696	0,000	0,855	0,991
		<i>R=0,802; R-sq=0,643; F=712,699; p=0,000</i>					
RI	SQ (c)	0,546	0,058	12,980	0,000	0,639	0,867
		<i>R=0,546; R-sq=0,299; F=168,476; p=0,000</i>					
CS	RI	0,674	0,044	18,719	0,000	0,720	0,895
		<i>R=0,674; R-sq=0,454; F=330,461; P=0,000</i>					
RI	SQ (c')	0,016	0,086	0,251	0,802	-0,147	0,190
	CS (b)	0,662	0,074	10,650	0,000	0,646	0,939
		<i>R=0,675; R-sq=0,455; F=164,871; p=0,000</i>					
Total Impact		0,753	0,058	12,980	0,000	0,639	0,867
Direct Effect		0,022	0,086	0,251	0,802	-0,147	0,190
Indirect Effect		0,531	0,051	-	-	0,432	0,631

As a practical translation of these findings, a 1-unit increase in satisfaction scores is associated with a significant increase in repurchase intention (standardized $\beta=0.674$; $R^2=0.454$). When the mediator variable is added, the direct effect of service quality becomes insignificant ($c'=0.016$; $p=0.802$), whereas the indirect effect remains significant (0.531 ; 95% CI $[0.432-0.631]$). This pattern suggests a full mediation structure consistent with ECT: quality investments increase repurchase intention only to the extent that they increase satisfaction. Managerially, it is recommended to prioritize dimensions that increase satisfaction the most, such as Physical Appearance and Reliability.

The results indicate that Service Quality has a substantial and statistically significant impact on Customer Satisfaction ($\beta = 0.802$; $SE = 0.035$; $t = 26.696$; $p < 0.001$). The 95% confidence interval for this relationship falls between 0.855 and 0.991, and it was determined that Service Quality accounts for 64.3% of the variance in Customer Satisfaction ($R^2 = 0.643$; $F = 712.699$; $p < 0.001$). Consequently, hypothesis H1 was supported. Additionally, the direct influence of Service Quality on purchase intention was found to be significant ($\beta = 0.546$; $SE = 0.058$; $t = 12.980$; $p < 0.001$), although it explained only 29.9% of the variation ($R^2 = 0.299$). This confirms the validity of H2. Regarding the effect of customer satisfaction on repurchase intention, the analysis showed that customer satisfaction significantly contributes as an independent predictor. While the constant term of the model is 0.038, it lacks statistical significance ($p = 0.829$).

The unstandardized coefficient (B) is 0.808, with a standard error of 0.044, and the standardized coefficient (β) is 0.674. These findings demonstrate that customer satisfaction has a strong and meaningful influence on repurchase intention ($t = 18.179$; $p < 0.001$). The confidence interval for this relationship ranges from 0.720 to 0.895. The total explanatory power confirms that customer satisfaction explains 45.4% of the repurchase behavior and the overall significance of the model is $F=330.461$, $p<0.001$. The Durbin-Watson value is 1.715, and there is no autocorrelation problem. The findings suggest that customer satisfaction plays a significant role in boosting repurchase intention, leading to the acceptance of hypothesis H3. When the mediating role of customer satisfaction was analyzed, it was found that the direct impact of Service Quality on repurchase intention became nonsignificant ($\beta=0.016$; $SE=0.086$; $t=0.251$; $p=0.802$). In contrast, the influence of customer satisfaction was both strong and statistically significant ($\beta=0.662$; $SE=0.074$; $t=10.650$; $p<0.001$), accounting for 45.5% of the variation in repurchase intention ($R^2=0.455$; $F=164.871$). In terms of the total effect, the total effect of Service Quality on repurchase intention was significant ($\beta=0.753$; $SE=0.058$; $t=12.980$; $p<0.001$). However, the direct effect ($\beta=0.022$; $p=0.802$) is not significant, and the indirect effect ($\beta=0.531$; $SE=0.051$) is dominant. This suggests that Service Quality is largely mediated by Customer Satisfaction. Consequently, because customer satisfaction fully mediates the relationship between Service Quality and repeats purchase, making the direct effect insignificant, hypothesis H4 is accepted. The

SQ→CS ($\beta \approx 0.80$) and CS→RI ($\beta \approx 0.66$) effects reported in Table 4 are consistent with the ECT hypothesis of 'expectation–confirmation → satisfaction → behavioral intention'; the insignificance of the c' coefficient on the SQ→RI path indicates full mediation. Thus, H1–H4 are jointly and holistically supported, confirming that satisfaction is the main determinant of behavioral intention in the ethnic restaurant context.

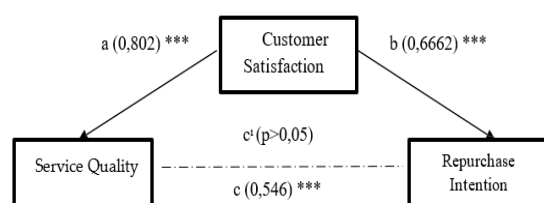


Figure 2. The Mediating Role of Customer Satisfaction in The Relationship Between Service Quality and Repurchase Intention: A Model Of Outcomes

0.413. The overall model is statistically significant with an F value of 278.551 ($p < 0.001$).

The direct influence of Physical Appearance on repurchase intention was also found to be significant ($\beta = 0.449$; $SE = 0.052$; $t = 9.997$; $p < 0.001$), although this effect explained only 20.2% of the variance ($R^2 = 0.202$; $F = 99.940$; $p < 0.001$). When examining the mediating effect of customer satisfaction within the model, the direct relationship between Physical Appearance and repurchase intention was no longer statistically significant ($\beta = 0.026$; $p = 0.586$).

Conversely, the influence of customer satisfaction on this intention was both strong and statistically significant ($\beta = 0.658$; $SE = 0.058$; $t = 13.566$; $p < 0.001$), accounting for 45.5% of the overall variance ($R^2 = 0.455$; $F = 165.085$). When considering the total effect, the overall impact of Physical Appearance on repurchase intention was also found to be significant ($\beta = 0.524$; $SE = 0.052$; $t = 9.997$; $p < 0.001$).

Table 5. The Mediating Role of Customer Satisfaction In The Relationship Between Physical Appearance and Repurchase Intention

Dependent Variable	Independent Variable	β	SE	t	p	%95 CI Lower	%95 CI Upp
CS	PA (a)	0,643	0,038	16,690	0,000	0,553	0,701
R=0,643; R-sq=0,413; F=278,551; p=0,000							
RI	PA (c)	0,449	0,052	9,997	0,000	0,421	0,627
R=0,449; R-sq=0,202; F=99,940; p=0,000							
RI	PA (c')	0,026	0,057	0,545	0,586	-0,081	0,142
	CS (b)	0,658	0,058	13,566	0,000	0,673	0,901
R=0,675; R-sq=0,455; F=165,085; p=0,000							
Total Impact		0,524	0,052	9,997	0,000	0,421	0,627
Direct Effect		0,031	0,057	0,545	0,586	-0,081	0,142
Indirect Effect		0,423	0,042	-	-	0,339	0,503

While the total effect of physical appearance (c) is significant, the direct effect (c') is insignificant when satisfaction is included, indicating that the effects are transmitted through the satisfaction channel. The interpretation that "atmosphere/tangibles" in ethnic restaurants translates into behavioral intention through satisfaction strengthens the contextual validity of the model.

The results indicate that Physical Appearance has a notable and statistically significant influence on Customer Satisfaction ($\beta = 0.643$; $SE = 0.038$; $t = 16.690$; $p < 0.001$). The 95% confidence interval for this effect ranges from 0.553 to 0.701. Additionally, it was determined that Physical Appearance accounts for approximately 41.3% of the variance in Customer Satisfaction, as shown by an R^2 value of

The direct impact ($\beta = 0.026$; $p = 0.586$) was not statistically significant, while the indirect impact ($\beta = 0.423$; $SE = 0.042$) was found to be the more prominent pathway. This suggests that Physical Appearance mainly affects repurchase intention indirectly through Customer Satisfaction. As a result, Customer Satisfaction fully mediates the relationship between Physical Appearance and repurchase behavior, rendering any direct effects negligible.

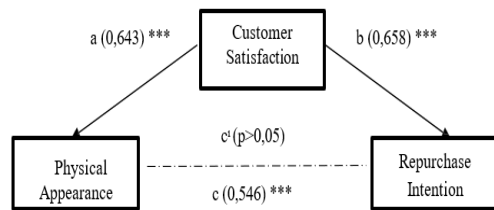


Figure 3. The Mediating Role of Customer Satisfaction in The Relationship Between Physical Appearance And Repurchase Intention: A Model of Outcomes

$t=13.549$; $p<0.001$). The model explains approximately 45.5% of the variance in repurchase intention, as indicated by an R^2 value of 0.455.

The overall analysis of the total effect showed that Reliability has a significant impact on Repurchase Intention ($\beta=0.522$; $SE=0.052$; $t=9.998$; $p<0.001$). However, the direct effect appears to be negligible and not statistically significant ($\beta=-0.003$; $p=0.962$), while the indirect pathway is the

Table 6. The Mediating Role of Customer Satisfaction in The Relationship Between Reliability and Repeat Purchase

Dependent Variable	Independent Variable	β	SE	t	p	%95 CI Lower	%95 CI Upp
CS	R (a)	0,668	0,036	17,844	0,000	0,577	0,720
R=0,668; R-sq=0,446; F=318,409; p=0,000							
RI	R ©	0,449	0,052	9,998	0,000	0,419	0,625
R=0,449; R-sq=0,202; F=99,961; p=0,000							
RI	R (c')	-0,002	0,058	-0,048	0,962	-0,117	0,111
	CS (b)	0,676	0,060	13,549	0,000	0,692	0,927
R=0,675; R-sq=0,455; F=164,815; p=0,000							
Total Impact		0,522	0,052	9,998	0,000	0,419	0,625
Direct Effect		-0,003	0,058	-0,048	0,962	-0,117	0,111
Indirect Effect		0,451	0,045	-	-	0,362	0,536

The findings show that the effect of Reliability on Customer Satisfaction is quite strong and statistically significant ($\beta=0.668$; $SE=0.036$; $t=17.844$; $p<0.001$). The 95% confidence interval for this effect is between 0.577 and 0.720, and the explanation rate of Reliability for Customer Satisfaction is found to be 44.6% ($R^2=0.446$). The direct effect of Reliability on Repurchase Intention is also significant ($\beta=0.449$; $SE=0.052$; $t=9.998$; $p<0.001$), but the explanatory power of this effect is 20.2%. When the mediating effect of Customer Satisfaction is analyzed, the direct influence of Reliability on repurchase intention is no longer significant ($\beta=-0.002$; $p=0.962$). In contrast, the impact of Customer Satisfaction on purchase intention is both strong and statistically meaningful ($\beta=0.676$; $SE=0.060$;

primary channel through which Reliability influences repurchase intention ($\beta=0.451$; $SE=0.045$). These findings indicate that Reliability primarily impacts the likelihood of repurchase indirectly via Customer Satisfaction, with the direct effect being negligible. Therefore, Customer Satisfaction serves as a full mediator in the relationship between Reliability and repurchase intention, overshadowing any direct influence Reliability might have.

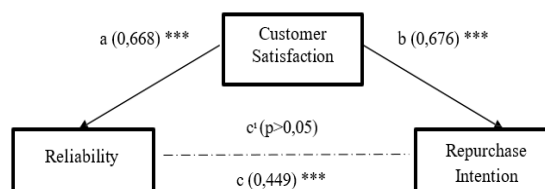


Figure 4. The Mediating Role of Customer Satisfaction 'n The Relationship Between Reliability and Repurchase Intention: A Model of Outcomes

Table 7. The Mediating Role of Customer Satisfaction 'n The Relationship Between Reliability and Repeat Purchase Intention

Dependet Variable	Independent Variable	β	SE	t	p	%95 CI Lower	%95 CI Upp
CS	A (a)	0,718	0,040	20,507	0,000	0,744	0,902
R=0,718; R-sq=0,515; F=420,545; p=0,000							
RI	A (c)	0,466	0,061	10,470	0,000	0,520	0,760
R=0,466; R-sq=0,217; F=109,629; p=0,000							
RI	A (c')	-0,038	0,073	-0,711	0,477	-0,196	0,092
	CS (b)	0,702	0,064	13,162	0,000	0,715	0,966
R=0,675; R-sq=0,456; F=165,277; p=0,000							
Total Impact		0,640	0,061	10,470	0,000	0,520	0,760
Direct Effect		-0,052	0,073	-0,711	0,477	-0,196	0,092
Indirect Effect		0,504	0,050	-	-	0,405	0,602

Table 7 indicates that Assurance has a strong and highly significant impact on Customer Satisfaction ($\beta=0.718$; $SE=0.040$; $t=20.507$; $p<0.001$). The 95% confidence interval for this effect ranges from 0.744 to 0.902, and Assurance accounts for approximately 51.5% of the variance in Customer Satisfaction, as shown by an R^2 of 0.515. Additionally, Assurance directly influences Repurchase Intention significantly ($\beta=0.466$; $SE=0.061$; $t=10.470$; $p<0.001$), although this direct effect explains only about 21.7% of the variance.

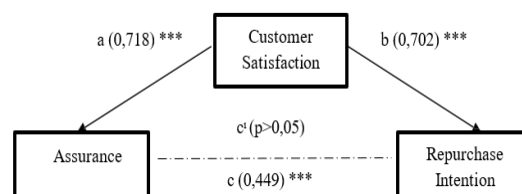


Figure 5. The Mediating Role Of Customer Satisfaction In The Relationship Between Assurance And Repurchase Intention: A Model Of Outcomes

Table 8. The Mediating Role Of Customer Satisfaction In The Relationship Between Empathy And Repurchase Intention

Dependet Variable	Independent Variable	β	SE	t	p	%95 CI Lower	%95 CI Upp
CS	E (a)	0,767	0,031	23,800	0,000	0,683	0,806
R=0,767; R-sq=0,589; F=566,444; p=0,000							
RI	E (c)	0,535	0,049	12,587	0,000	0,524	0,718
R=0,535; R-sq=0,286; F=158,424; p=0,000							
RI	E (c')	0,042	0,067	0,719	0,472	-0,084	0,181
	CS (b)	0,643	0,069	11,102	0,000	0,633	0,906
R=0,675; R-sq=0,456; F=165,288; p=0,000							
Total Impact		0,621	0,049	12,587	0,000	0,524	0,718
Direct Effect		0,048	0,067	0,719	0,472	-0,084	0,181
Indirect Effect		0,493	0,044	-	-	0,406	0,580

When examining the mediating role of Customer Satisfaction, the direct relationship between Assurance and Repurchase Intention was no longer statistically significant ($\beta=-0.038$; $SE=0.073$; $t=-0.711$; $p=0.477$).

The influence of Customer Satisfaction on this purchasing behavior was found to be both strong and statistically significant ($\beta=0.702$; $SE=0.064$; $t=13.162$; $p<0.001$), explaining approximately 45.6% of the variance in the model ($R^2=0.456$). The overall analysis revealed that Assurance has a significant total effect on Repurchase Intention ($\beta=0.640$; $SE=0.061$; $t=10.470$; $p<0.001$). Nonetheless, the direct effect of Assurance on Repurchase Intention was not statistically significant, with the primary impact occurring through the indirect pathway ($\beta=0.504$; $SE=0.050$). These findings suggest that Assurance's effect on Repurchase Intention is predominantly mediated by Customer Satisfaction. In this context, Customer Satisfaction acts as a key mediator, fully capturing the influence of Assurance and overriding any direct effects.

The results indicate that Empathy has a strong and statistically significant impact on Customer Satisfaction ($\beta=0.767$; $SE=0.031$; $t=23.800$; $p<0.001$). The 95% confidence interval for this effect ranges from 0.683 to 0.806, and Empathy accounts for approximately 58.9% of the variance in Customer Satisfaction, as shown by an R^2 of 0.589. Empathy demonstrates considerable explanatory power over Customer Satisfaction, and the overall model is statistically significant ($F=566.444$; $p<0.001$). Additionally, Empathy directly influences Repurchase Intention significantly ($\beta=0.535$; $SE=0.049$; $t=12.587$; $p<0.001$), although this direct effect explains only about 28.6% of the variance ($R^2=0.286$). When the mediating role of Customer Satisfaction was considered, it was observed that the direct relationship between Empathy and Repurchase Intention became non-significant ($\beta=0.042$; $SE=0.067$; $t=0.719$; $p=0.472$).

The practical significance of the following findings can be interpreted as follows: Calculated correlation coefficients indicate the direction and strength of the relationship between service quality and customer satisfaction/repurchase intention. For example, a positive correlation indicates that

these variables increase together. In regression analysis, the coefficient of each independent variable indicates the average change in the dependent variable resulting from a one-unit increase in that variable (Gün and Söyük, 2025). Regression coefficients obtained from research on how many

units a one-unit increase in customer satisfaction increases repurchase intention can be interpreted from the perspective of customer behavior, determining which service quality dimensions have the greatest impact on satisfaction and repurchase intention. Positive and high coefficients indicate that improvements in the relevant service element increase customer loyalty more strongly. In regression analysis, the coefficient of each independent variable represents the average change in the dependent variable resulting from a one-unit increase in that variable. For example, a study published in Atlantis Press found that a one-unit increase in the "Attributes Related to Product" variable increased repurchase intention by approximately 0.33 points (Lau, 2019). Such findings are helpful in interpreting which service quality dimensions have a stronger impact on satisfaction and repurchase intention.

The influence of Customer Satisfaction on this purchasing behavior was found to be both significant and substantial ($\beta=0.643$; $SE=0.069$; $t=11.102$; $p<0.001$), accounting for 45.6% of the overall variance ($R^2=0.456$). Regarding the total effect, Empathy significantly impacts Repurchase Intention ($\beta=0.621$; $SE=0.049$; $t=12.587$; $p<0.001$). However, the direct influence of Empathy on Repurchase Intention was not statistically significant, with the primary contribution coming from the indirect pathway ($\beta=0.493$; $SE=0.044$). This indicates that the effect of empathy on repeated purchase intention is mainly mediated through customer satisfaction. As a result, customer satisfaction acts as a complete mediator, overshadowing any direct effect of empathy in this relationship.

Theoretical Linkage and Status of Hypotheses

The finding that service quality perception significantly and strongly increases customer satisfaction ($\beta=0.802$; $R^2=0.643$; $p<0.001$) aligns with the expectation-confirmation approach (ECT) we adopted in our theoretical framework, which predicts that

"performance meeting/exceeding expectations will increase satisfaction." Thus, H1 was supported. The results also show that the total effect of service quality on repurchase intention is significant ($\beta=0.546$; $p<0.001$), supporting H2. The effect of satisfaction on repurchase intention is strong and significant ($\beta=0.662$; $R^2=0.455$; $p<0.001$), and H3 was confirmed. When satisfaction is included in the model, the direct effect of service quality on intention becomes insignificant ($c'=0.016$; $p=0.802$), and the relationship is seen to be indirectly carried through satisfaction; this pattern supports the mediation construct within H4. The direction and pattern of the findings are consistent with the findings of ECT-based studies emphasizing that satisfaction is the primary determinant of repurchase intention (Ashfaq et al., 2019; Yuliantoro et al., 2025).

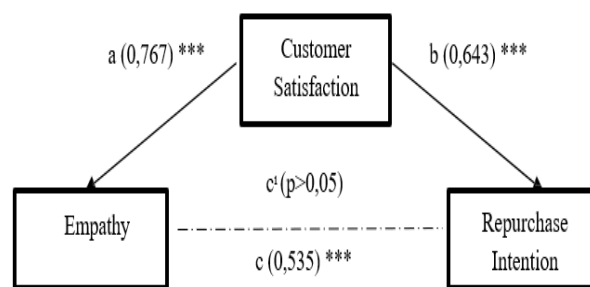


Figure 6. The Mediating Role of Customer Satisfaction in The Relationship Between Empathy and Repurchase Intention: A Model Of Outcome

Discussion

The act of eating has gone beyond being a basic need; it not only serves as a socializing opportunity, escape from daily routine, and satisfaction for customers, but has also become a factor of attraction for businesses. Over time, increasing customer awareness and rising living standards have significantly impacted the quality of the services provided on customer satisfaction and repurchase intentions (Yalçinkaya & Çoban, 2020). Customers' desire to discover new flavors, coupled with a demand for local cuisine, influences the preference for ethnic restaurants. The study was conducted with the participation of customers at ethnic restaurants operating in the Richmond district of southwest London.

Theoretical Implications and Consistency with the Literature

In this study, the chain of service quality → customer satisfaction → repurchase intention was confirmed with a full mediation pattern. It can be seen that when satisfaction is added, the direct effect of service quality on intention disappears, and the effect is carried through satisfaction (see $c'=0.016$; $p=0.802$). This finding is consistent with the expectation-confirmation approach (ECT)'s emphasis that satisfaction is the primary determinant of behavioral intentions and supports the H1–H4 predicted in our theoretical model as a whole. Similarly, studies based on ECT in SAGE Open report that satisfaction drives reuse/repurchase intention (Ashfaq et al., 2019). Our pattern is also parallel to recent findings in the restaurant/ethnic restaurant literature. Service experiences such as authenticity and ambiance have been shown to strengthen revisit/repurchase intention through satisfaction and positive emotions; This supports the 'quality → satisfaction → intention' pipeline in our model with external validity. Current findings from AJHTL and peer-reviewed studies indicate that our findings are consistent with the literature and up-to-date (Yuliantoro et al., 2025). This full mediation pattern strengthens the external validity of the ECT-based model in the ethnic context by demonstrating that contextual elements such as physical environment/authenticity in ethnic restaurants are carried over to behavioral intention via satisfaction.

This research corroborates several relationships identified in previous studies within the existing literature and provides a platform for deriving original insights. The analysis of the structural model underscores the connections between service quality perception, customer satisfaction, and the intention to repurchase. The results related to the sub-dimensions of service quality—which are the primary focus of this investigation—demonstrate a positive influence on both customer satisfaction and repurchase intentions.

It was determined that the effect of service quality on the likelihood of repeat purchases is predominantly mediated by customer satisfaction.

The results contradict the finding in Cronin & Taylor's (1992) study that "service quality has a lesser impact on customer repurchase intentions than customer satisfaction." A, Study results are generally consistent with the literature on restaurants in the food and beverage sector (Vanniarajan & Gurunathan, 2009; Koçbek, 2015). A review of the literature on ethnic restaurants, in particular, reveals differences in the relationships between variables and the results obtained, providing an important reference point for restaurant staff and decision-makers.

In the tourism sector, service quality plays a significant role in the sustainability and success of food and beverage businesses, as do customer opinions and repeat purchase decisions in highly competitive markets (Namin, 2017). Ethnic restaurants, in particular, offer the opportunity to experience a different culture, providing direct communication with customers, requiring businesses to deliver high standards of service and create a positive perception of value. The results of the study indicate that ethnic restaurant customers generally have a high level of satisfaction with service quality. Among the service quality factors that contribute to satisfaction, physical appearance ranks first, followed by reliability, assurance, and empathy. This suggests that the physical environment of businesses is critical for customers' comfort and the visual appeal of the products offered.

This result is consistent with studies in the literature by Ryu & Jang (2007), Şahin & Şen (2017). There are also studies in which trust and empathy are the most influential factors on customer satisfaction (Tan et al., 2014). The prominence of physical appearance reflects ethnic restaurant customers' interest in learning about, experiencing, and discovering authentic cultures without leaving their home countries (Turgeon & Pastinelli, 2002). Failure to meet customer expectations in any service area, including the food and beverage sector, can negatively impact customers' repurchase intentions and lead them to switch to competing businesses (Kılıç & Kurnaz, 2012). The positive and significant relationship between customer satisfaction and repurchase intention within the scope of this study is consistent with many studies in the literature (Wiranto & Husin, 2016; Arlanda &

Suroso, 2018; Mensah & Dei Mensah, 2018). For companies, achieving high customer satisfaction is crucial, as it directly influences the chances of customers returning for repeat business. Changes in satisfaction levels tend to have a proportional effect on the decision to repurchase, regardless of whether satisfaction is high or low.

Implications for Practice

To strengthen the perception of service quality in ethnic restaurants, structured training on staff's cultural awareness and communication skills should be implemented. Communication that is sensitive to guests' cultural backgrounds reduces misunderstandings and increases satisfaction. Literature shows that cultural intelligence/sensitivity-based training improves indicators of service quality and guest experience (Koç, 2021; Jiony et al., 2021). Including authentic dish names on menus with descriptive translations and having waiters use basic expressions in foreign languages reduces communication difficulties. In the physical environment, emphasizing authentic decor such as traditional symbols, music, and clothing to make the experience realistic enhances the customer experience (Premordia, İ., & Gál, T., 2023). Furthermore, supporting dish names with short descriptions and/or photographs reduces ambiguity and increases satisfaction, especially among foreign customers (Wang et al. 2024). Designing the restaurant's physical environment with atmosphere, decor, and authenticity, including decor, music, and visual symbols, and structuring service interactions to support the perception of authenticity, increases satisfaction and loyalty (Tsai & Lu, 2012). Community interaction and events are important activities for attracting new customers. Participating in cultural food events and festivals or organizing themed events within the restaurant makes the authentic experience visible, attracting new customers and encouraging repeat visits (Carvache-Franco et al., 2023).

Conclusion and Recommendations

One of the main reasons for the proliferation of ethnic restaurants today is that customers who choose these establishments seek the appealing elements

of regional cuisine, such as ingredients, cooking techniques, interior ambiance, and the discovery of cultural values. Simply offering exotic and unique flavors is not enough to meet evolving customer demands and needs (Turgeon & Pastinelli, 2002). Beyond flavor and authenticity, determining the relationship between customers' perceptions of service quality, satisfaction, and repurchase intentions has become crucial for businesses.

This research examined how customers' perceptions of service quality in ethnic restaurants influence their overall satisfaction and willingness to revisit. Due to the limited number of studies addressing this topic, especially in both national and international scholarly work, this study addresses an important gap in the existing literature and is considered pioneering in this field.

The primary objective of the study is to reveal the impact of customers' perceptions of service quality on repurchase and satisfaction, as well as to examine the differences between these perceptions and customer demographics. Five hypotheses were developed and tested in this regard. In the current literature, there are many studies on the effect of service quality on customer satisfaction (Petzer & Mackay, 2004; Çelik, 2012; Tan et al., 2014) and the effect of satisfaction on repurchase intention (Gupta et al., 2007; Liu & Jang, 2009). Although Sarıgül & Ayyıldız (2022) examined the effect of service quality perception on customer satisfaction and repurchase intentions, there is no definitive finding on this subject, especially in the context of ethnic restaurants.

The findings suggest that perceptions of service quality have a meaningful influence on both customer satisfaction and their intention to repurchase. This aligns with the results reported by Korkmaz et al. (2015) in related studies. To explore the connections between service quality and its various subdimensions, as well as their effects on satisfaction and repurchase behavior, correlation analysis was performed. The outcomes revealed a positive and statistically significant correlation across all sub-dimensions of service quality, which notably affected both customer satisfaction and purchase re-engagement. Consequently, it can be inferred that as customers' perceptions of service quality improve—alongside the quality of food offered—their overall satisfaction increases. This

heightened satisfaction subsequently encourages a stronger tendency to revisit the restaurant.

The significant effect of customer satisfaction on repurchase intention demonstrates that, for businesses, increasing customer satisfaction levels contributes to their continued likelihood of future purchases (Liu & Thompkins, 2013). While service quality did not exhibit a significant direct influence on the intention to repurchase, it appears that this relationship is mediated by customer satisfaction. This indicates that customer satisfaction is a key factor that determines how perceptions of service quality in ethnic restaurants affect customers' intentions to return.

A customer who perceives the service quality unfavorably is generally assumed to have lower intentions of repurchasing, whereas a satisfied customer is more likely to engage in repeat business. These findings align with previous research by Çavuşgil & Ayhün (2020), Sarıgül & Ayyıldız (2022), and various other studies documented in the existing literature.

As a result of the overall evaluation of the research, various recommendations have been developed for ethnic restaurant operators. Within the scope of these recommendations, minimizing service errors during service processes that involve direct customer interaction will positively impact the perception of service quality. Therefore, increasing the importance businesses place on service quality can have positive effects on

customer satisfaction and repurchase intentions. Because service quality consists of various dimensions, identifying deficiencies in all sub-dimensions and taking corrective measures to enhance competitiveness and profitability will positively stimulate customer satisfaction and repurchase intentions.

Future Studies

As previously mentioned, this study analyzes feedback from customers who have experienced ethnic restaurants operating in the Richmond district of England. Therefore, future research could expand the scope of the study by evaluating different variables more holistically, leading to more

general and comprehensive conclusions. New research could be conducted using different scales measuring service quality perception, customer satisfaction, and repurchase intention, and different findings could be obtained. Furthermore, considering the direct communication between ethnic restaurant customers, comparative analyses could be conducted using qualitative research methods and quantitative studies. Thus, the content and scope of the current research can be further enriched.

Future studies should examine the impact of demographic and cultural diversity in more detail. How service quality perceptions differ across different age, gender, and income groups and their experiences with ethnic restaurants can be investigated.

Furthermore, comparative designs with cross-cultural samples could explore the conditions under which the role of authenticity and atmospheric perception on satisfaction/intention is strengthened (Tsai & Lu, 2012). Methodologically, longitudinal studies are among the recommended studies, moving beyond cross-sectional designs. This allows for the relationship between satisfaction over time and indicators of repurchase intention and profitability. This allows for the permanence of the effects of service quality dimensions to be assessed (Bernhardt et al., 2000). Finally, studies examining the impact of assimilation and immigration dynamics on food preferences can be instructive in explaining the "everydayness" of ethnic cuisine and the shift in customers' cultural affiliation and preference structures.

Therefore, longitudinal comparisons between different generations and levels of cultural adaptation are recommended for a better understanding and analysis of this measurement (Boch et al., 2020).

Future research could examine the moderating effects of demographic and cultural variables such as age, gender, education, and income using multi-group structural models. Cross-cultural replications across different countries/cities could strengthen the generalizability of the findings by conducting measurement equivalence tests. Furthermore, longitudinal designs and field experiments would reveal the dynamics and boundary

conditions of the satisfaction → repeat purchase chain over time.

Declarations

Funding: No funding was received for conducting this study.

Conflicts of Interest: The authors declare no conflict of interest.

Ethical Approval: The study was conducted in accordance with the principles of the Declaration of Helsinki. Data were collected from participants on a voluntary basis through face-to-face surveys. If required, details of ethical approval can be provided by the authors.

Informed Consent: All participants were informed about the purpose of the research and provided their voluntary consent prior to participation.

Data Availability: The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

Authors' Contributions: This article is derived from the first author's doctoral dissertation. The first author conducted the research and prepared the manuscript. The second author is the PhD advisor of the first author and contributed by providing academic supervision, guidance, and revisions.

AI Disclosure: No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the authors in accordance with scientific research methods and academic ethical principles.

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RESEARCH ARTICLE

Exploring the Ecological Background of Learning Turkish as a Second Language: Insights from Zumbo's Framework

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Abstract

With increasing immigration, teaching Turkish as a second language has become a national educational priority in Türkiye. The rise in international students—particularly through programs such as Türkiye Scholarships—has intensified the need to understand the ecological factors shaping their learning. This study investigates the ecological background influencing Turkish language acquisition among students in public and private schools and Turkish teaching centers. Using Zumbo's ecological framework and a phenomenological design, it examines variables affecting the four core language skills—listening, reading, speaking, and writing—across layers from individual traits to broader national contexts. Data were gathered through semi-structured interviews with participants at four educational levels: primary, middle, and high school students, and adults. Thematic analysis showed that motivation, classroom strategies, teacher support, family engagement, and digital tool use interact across ecological layers to shape language learning. The findings underscore the distinct needs of each age group and the importance of pedagogical sensitivity. The study affirms the value of ecological perspectives in Turkish language education and offers practical recommendations for educators, policymakers, and researchers.

Keywords: Turkish, second language learning, ecological framework, Zumbo**Öz**

Artan göç hareketleri ile Türkçenin ikinci dil olarak öğretilmesi Türkiye'nin öncelikli hedeflerinden biri hâline getirmiştir. Özellikle Türkiye bursları gibi programlarla gelen öğrencilerle birlikte ele alındığında farklı seviye ve grupların öğrenme süreçlerini etkileyen ekolojik faktörlerin belirlenmesine duyulan ihtiyaç artmaktadır. Bu sebeple çalışma devlet okulları, özel kurumlar ve Türkçe öğretim merkezleri gibi resmi kurumlara kayıtlı öğrencilerin Türkçe öğrenme süreçlerini şekillendiren ekolojik arka plana odaklanmaktadır. Zumbo'nun ekolojik çerçevesinden yararlanılan araştırma kişinin şahsi karakterinden içinde bulunduğu topluma kadar geniş bir ekolojik çerçevede dört dil becerisinin öğrenimini etkileyebilecek değişkenleri keşfetmek amacıyla fenomenolojik desende tasarlanmıştır. Farklı eğitim kademelerini temsil edebilmek için ilkokul, ortaokul, lise ve yetişkinlerden oluşan 4 grupta yarı yapılandırılmış görüşmelerle veriler toplanmıştır. Tematik analiz bulguları ekolojik çerçeve ile uyumlu olarak öğrencilerin motivasyonu, sınıf içi stratejiler, öğretmen desteği, aile katılımı ve dijital araçların kullanımı gibi çok sayıda değişkenin ekolojik tabakalarda öğrenme süreçleri ile etkileşime girdiğini göstermektedir. Sonuçlar aynı zamanda her yaş grubunun kendine özgü ekolojik ihtiyaçları olduğunu vurgulamakta ve pedagojik gelişim süreçlerinin dikkate alınması gerekliliğini vurgulamaktadır. Ayrıca ekolojik çerçevenin ikinci dil olarak Türkçe öğretimi alanı için ihmal edilmez olduğuna işaret etmektedir. Bu yolla ekolojik çerçeve ikinci dil olarak Türkçenin öğrenilmesi için eğitimciler, politika yapıcılar ve araştırmacılar için pratik tavsiye ve teklifler sunmaktadır.

Anahtar Kelimeler: Türkçe, ikinci dil öğrenimi, ekolojik çerçeve, Zumbo.

Introduction

The global increase in migration has compelled host countries to design inclusive educational policies that accommodate diverse learners (McAuliffe & Khadria, 2019; Vézina & Bélanger, 2019). Türkiye, as both a transit and destination country, has seen significant growth in asylum seekers and long-term residents (Karapınar Kocağ & Longhi, 2022). Programs such as Türkiye Scholarships and curricular reforms (Aras & Mohammed, 2019) and curricular initiatives (Türkiye Maarif Vakfı, 2019) have expanded access to Turkish language education. Nevertheless, instructional practices often remain uniform, overlooking the complex social and cultural realities shaping learners' progress (Council of Europe, 2020; Uysal, 2021). A structured framework is therefore needed to capture these contextual dynamics and guide more responsive approaches to language teaching.

In Türkiye, where learner populations are highly diverse (Göktentürk, 2016; TÜİK, 2024) second language acquisition must be understood as a socially embedded process influenced by families, teachers, peers, and communities (Blyth & Thoms, 2021; Chong et al., 2023). In multilingual and migration-affected contexts, these interactions are shaped by distinct ecological realities including displacement histories (Gün & Tüzmen, 2021), access to resources (Ekşi & Demirkol, 2023), institutional support systems (Tanman & Özgenel, 2021), and cultural adaptation challenges (İnce Yakar & Fedai, 2022). Recognizing these multiple influences enables educators to move beyond generalized strategies and address the conditions under which different groups acquire Turkish.

Among the emerging frameworks, Zumbo's ecological lens offers a particularly promising approach (Göktentürk et al., 2023; Zumbo et al., 2015). Rather than viewing learning as an isolated or purely cognitive activity, Zumbo's model conceptualizes it as a phenomenon embedded within interacting ecological layers (Zumbo, 2017). These include (1) individual characteristics, (2) classroom and school environments, (3) family and non-school ecological factors, and (4) broader societal and national structures (Göktentürk, 2021). Each layer contributes uniquely to shaping educational

experiences, and their interrelations can help explain why similar instructional approaches yield different outcomes for different learners (Sağlam et al., 2023). By analyzing how these layers converge, the framework explains why uniform instructional approaches can yield varied outcomes. In this study, Zumbo's model is applied to Turkish as a second language across different educational levels, aiming to reveal how ecological conditions both enable and constrain the development of Turkish language skills.

Although prior research has acknowledged various factors influencing second language learning (Çakar Turan, 2024; Demirel & Yalçın, 2021), few studies have examined their interactive effects through an ecological perspective, and none have applied Zumbo's model to Turkish language education. This gap limits the development of pedagogical strategies that reflect the realities of multilingual, migration-affected classrooms. Addressing this need, the present study investigates how ecological layers—individual, institutional, familial, and national—shape Turkish language learning. Specifically, it asks:

1. What is the ecological background of teaching Turkish as a second language at the primary school level in Türkiye?
2. What is the ecological background of teaching Turkish as a second language at the middle school level in Türkiye?
3. What is the ecological background of teaching Turkish as a second language at the high school level in Türkiye?
4. What is the ecological background of teaching Turkish as a second language at the adult education level in Türkiye?

Literature Review and Theoretical Background

Second language learning: Core concepts

The distinction between a second and a foreign language is central to understanding language acquisition. A second language is learned in environments where it is actively used for communication, whereas a foreign language typically remains confined to classroom contexts (Cook, 2016; Lightbown & Spada, 2021). In Türkiye, the concept

of “second language” has become increasingly relevant with the growing presence of long-term migrants, refugees, and international students who rely on Turkish across social and institutional domains (Aras & Mohammed, 2019; Dilek et al., 2018; McAuliffe & Khadria, 2019).

Within formal educational settings, Turkish functions both as the medium of instruction and a means of integration (Şimşek & Bozkırlı, 2024; Yılmaz, 2017). Unlike informal or heritage language acquisitions, curricular frameworks demand proficiency in language skills (Barın, 2004; Türkiye Maarif Vakfı, 2019). These skills develop interdependently, shaped by individual characteristics, instructional quality, and environmental factors (Chong et al., 2023; Griffiths & Soruç, 2021). Their dynamic interplay highlights the importance of adopting an ecological perspective that accounts for the varied learner backgrounds and contexts in which Turkish as a second language is acquired.

Theoretical Shifts in Second Language Learning

Second language learning theories have shaped Turkish language education through several paradigms—behaviorist, nativist, sociocultural, communicative, and action-oriented. Each perspective illuminates different dimensions of learning and contributes to a comprehensive understanding of how Turkish is acquired in diverse contexts.

Behaviorist theory, rooted in the work of Skinner (1986), views learning as habit formation through stimulus-response reinforcement (Mohamad Nor & Rashid, 2018). This paradigm informed early approaches to Turkish language instruction, particularly grammar-translation and audiolingual methods, where repetition and drilling were central to standard curricula (Powell et al., 2002; Yılmaz, 2021). Although criticized for neglecting meaning and interaction, its emphasis on structure still influences contemporary practices in controlled classroom environments (Amira, 2024; Yıldız Yalçın & Özdemir, 2025).

Nativist theory, pioneered by Chomsky (1965), argues that humans possess an innate language acquisition device (LAD) and universal grammar (Drobňák, 2025). Applied to Turkish, this theory underscores the role of immersion and rich linguis-

tic environments in enabling learners to build competence beyond explicit instruction (Eigsti, 2021). In public schools and Turkish-speaking communities, where input is abundant, learners’ cognitive readiness becomes a key determinant of their progress (Albayrak, 2023; Amira, 2024).

Sociocultural theory, rooted in Vygotsky’s work, positions language development as a socially mediated process shaped by interaction and cultural tools (Tzuriel, 2021; Vygotsky & Cole, 1978). Core concepts such as the zone of proximal development and scaffolding emphasize the importance of teacher guidance and peer collaboration (Mahn, 2012). In Türkiye’s multilingual classrooms, where cultural diversity is pronounced, this perspective supports pedagogical approaches that are responsive to learners’ sociocultural backgrounds (Yazıcı & Gökentürk, 2020).

The communicative approach shifted attention from structure to meaning, emphasizing functional use of language in authentic contexts (Hymes, 1972). Known internationally as *communicative language teaching* (CLT), this approach focuses on fluency, functional language use, and meaningful communication in real-life situations (Adem & Berkessa, 2022). Particularly in Turkish Teaching Centers (TÖMER) or private institutions, communicative practices support learners in developing practical language skills needed for daily life, bureaucratic tasks, and academic participation (Şenel & Şengül, 2021).

The action-oriented approach, central to the Common European Framework of Reference for Languages (CEFR), regards learners as social agents who accomplish tasks through language (Council of Europe, 2020). Its performance-based descriptors link learning outcomes to what students can do in real-life situations (Piccardo & North, 2019). In Türkiye, where formal education settings increasingly align with CEFR guidelines, this approach has gained traction in curriculum development for Turkish as a second language (Kılınç, 2021; Turkish Maarif Foundation, 2020). In Türkiye, this approach has guided curriculum reforms and inspired task-based, project-based, and competency-driven models in Turkish language programs (Ak Başoğlu, 2022; Eraslan & Yücel, 2024).

Together, these paradigms highlight the cognitive, social, and contextual dimensions of second language learning. Their cumulative insights laid the groundwork for ecological models, which integrate these perspectives to capture the layered realities of teaching and learning Turkish.

Ecological Lens in Second Language Learning

Zumbo's ecological framework draws on Bronfenbrenner's ecological systems theory in its recognition that learning is situated within nested, interdependent contexts (Bronfenbrenner, 1979; Zumbo et al., 2015). Both frameworks emphasize the interaction of individual and environmental factors, challenging reductionist views of development (Härkönen, 2001; Zumbo, 2017). Yet, while Bronfenbrenner's theory emerged from developmental psychology, Zumbo's model originated in educational measurement to address validity, fairness, and equity in diverse populations (Göktentürk et al., 2023). This foundation makes it particularly suited to examining how psychometric concerns intersect with sociocultural and institutional realities in second language research.

Initially developed for test validity, Zumbo's ecological framework has since been adapted for broader educational contexts (Sağlam et al., 2023; Sağlam & Goktenturk, 2024). Its layered structure captures how immediate and extended environments influence learning processes and outcomes (Göktentürk, 2021). Rather than isolating the learner, the framework maps how structural and cultural features of schools, families, and communities create supports or barriers to learning (Launeanu & Hubley, 2017; Sağlam et al., 2023). In second language education, this perspective has been reflected in initiatives such as bilingual family literacy programs, heritage language projects, and teacher professional development targeting diverse classrooms (Gasca Jiménez & Adrada-Rafael, 2021; Mansouri et al., 2021). In this study, Zumbo's model is applied to Turkish as a second language to examine four interrelated ecological layers.

Layer 1: Personal characteristics and individual differences. This innermost layer encompasses personality-related variables such as motivation, resilience, prior knowledge, and self-efficacy (Ashton, 2023; Fox, 2003). These attributes, often shaped by age, migration history, and educational background (Heinonen & Nissen-Lie, 2020; Holopainen & Björkman, 2005), strongly influence how learners engage with Turkish as a second language. In particular, such individual differences determine how students approach language tasks, respond to feedback, and persist through linguistic challenges (Barın, 2004; İnal & Çakır, 2021). For example, individualized goal-setting and self-access learning opportunities in TÖMER programs help sustain motivation for learners with varying self-efficacy (Hamzadayı & Büyükikiz, 2015).

Layer 2: Classroom and school context. Institutional dynamics—including teacher quality, pedagogy, school climate, and peer relations—form the second layer (Zumbo, 2023). Turkish learners encounter diverse school structures, from public schools to TÖMER centers, each with varying resources and support (Tanman & Özgenel, 2021). These factors shape not only the availability of learning resources but also the quality of pedagogical engagement (Hirschy & Wilson, 2002; Shogren et al., 2013). Classroom practices such as cooperative learning in mixed-nationality groups and culturally responsive curricula illustrate how this layer shapes second language acquisition (Tanrikulu, 2021; Yazıcı & Göktentürk, 2020).

Layer 3: Family and out-of-school. This layer addresses the influence of the home environment and other non-school settings (Subotnik et al., 2019). Elements such as the presence of Turkish-speaking family members, family attitudes, literacy practices, and socioeconomic conditions affect learners' access to Turkish beyond school (Boylu & Işık, 2019; Toprak Ay & Göktentürk, 2023). Ethnolinguistic enclaves can limit exposure, while community resources such as libraries or NGO programs offer additional practice opportunities (Toluoğlu & Çiftçi, 2022). These out-of-school influences are particularly significant for migrant and refugee students.

Layer 4: Educational system, national and state-level characteristics. The outermost layer encompasses integration policies, societal discourse on migration, and the role of Turkish as a gatekeeping language (Stein et al., 2007; Turkish Maarif Foundation, 2020). In Türkiye, projects such as PİKTES provide large-scale ecological support by offering language education, psychosocial assistance, and teacher training for refugee children (Güngör Yereyikılmaz & Güner Özer, 2025). National policy and societal attitudes therefore strongly shape both opportunities and constraints in learning Turkish.

By integrating these four layers, Zumbo's ecological framework provides a multidimensional account of second language learning. It situates acquisition within the interaction of personal, institutional, familial, and societal factors, making it particularly relevant in Türkiye's migration-affected context. Extending Zumbo's original concern with *in vivo* measurement Göktentürk et al., 2023; Zumbo, 2017), this study applies the framework to authentic learner experiences, aligning with calls in applied linguistics to bridge ecological theory with policy and practice (Lier, 2010). It thus establishes the conceptual foundation for analyzing how ecological conditions shape Turkish language learning across educational levels.

Method

This study employed a qualitative paradigm with a phenomenological design to explore the ecological dimensions of learning Turkish as a second language. Phenomenology was selected to capture how learners experience and interpret language learning across educational, familial, and societal contexts (Creswell, 2009; Pilarska, 2021). The phenomenon under investigation was the process of acquiring Turkish in formal education settings—public schools, private institutions, and Turkish Teaching Centers (TÖMER).

The research was conducted during the 2023–2024 academic year with participants actively enrolled in Turkish language education, allowing situated experiences to be examined within a defined timeframe. Anchored in a constructivist paradigm, the study recognizes that learners' perceptions are

shaped by social and instructional interactions (Pilarska, 2021; Ponterotto, 2005). This orientation aligns with the study's aim of revealing the layered realities of learners from diverse backgrounds.

The analysis followed four steps consistent with phenomenological inquiry: (1) categorizing learners by educational level to identify context-specific patterns; (2) conducting semi-structured interviews to elicit personal narratives; (3) analyzing experiences through Zumbo's ecological framework; and (4) synthesizing emergent findings into themes and categories that reflect core meanings (Creswell, 2016; Miles et al., 2014). Reporting adhered to the Standards for Reporting Qualitative Research (SRQR) (O'Brien et al., 2014), ensuring methodological transparency and rigor.

Participants

A combination of stratified and snowball sampling was used to capture ecological variation in learners' experiences across educational levels (Creswell, 2009; Yıldırım & Şimşek, 2016). Participants were grouped into four categories—primary, middle, and high school students, and adult learners—reflecting the structure of the Turkish education system. Kindergarten learners were excluded since Turkish is not yet systematically taught as a second language in early childhood settings.

Within each group, sampling was further stratified by grade level or program type to ensure intra-group diversity. A total of 48 participants were recruited from public schools, private schools, and Turkish Teaching Centers (TÖMER). Initial participants were identified through stratification, with further recruitment via snowball sampling until data saturation was achieved (Kerr et al., 2010). Inclusion criteria required active enrollment in a formal Turkish language program during the 2023–2024 academic year and willingness to participate in semi-structured interviews. Alongside age and educational level, participants' countries of origin were recorded to contextualize their sociocultural backgrounds and inform interpretation of ecological factors influencing their learning

Table 1. Participants

Group	Educational Level or Learning Purpose	Participant Number	Country of Origin	Age Range
Primary school	Grade 1	7	Germany, USA, France, Syria, Jordan	6-7
	Grade 2	2	Zambia, Sweden	8-9
	Grade 3	8	Pakistan, United States, Syria, United Kingdom, Zambia, China, Yemen, Australia	9-10
	Grade 4	3	United States, Jordan, Australia	10-11
Middle school	Grade 5	5	Australia, Sweden, Syria, United States	11
	Grade 6	4	South Korea, Uzbekistan, Egypt, Lebanon	11-12
	Grade 7	2	Australia, Syria	12-13
High school	Grade 8	1	United States	13
	Grade 9	3	Egypt, Syria, Dubai	15
	Grade 10	2	Dubai, China	16
	Grade 11	2	Syria	17
	Grade 12	2	Syria, Iraq	18
Adult Learners	University preparation	3	Tunisia, Syria, Morocco	25-36
	Graduate education preparation	2	Egypt, Syria	32-41
	Daily-life	2	Syria	34-65

Data collection process

Data collection was guided by the adapted version of Zumbo's ecological model (Göktentürk, 2021; Göktentürk et al., 2023). The original framework includes item-level response processes (Zumbo et al., 2015), but this component was excluded given the qualitative focus of the study. Accordingly, the model was operationalized through four ecological layers—personal characteristics, classroom and school context, family and out-of-school ecology, and societal and national factors—which also structured the interview protocol.

A semi-structured interview protocol was developed through iterative expert consultation (Srivastava & Hopwood, 2009). In Turkish language education reviewed the draft items and recommended adding probing questions to elicit greater depth. Based on this feedback, each of the four main questions was supplemented with follow-up prompts. The finalized protocol is presented in the Supplementary Materials.

Interviews were conducted one-on-one and in person with volunteers from each learner group—primary, middle, and high school students, as well as adult learners—initially in Istanbul. Following these contacts, snowball sampling was used to identify additional participants until data saturation was achieved (Creswell, 2009; Yıldırım & Şimşek, 2016). The data collection phase lasted two weeks.

Participants received the interview form in advance and were briefed on study procedures. Informed consent was obtained both prior to and during interviews, and confidentiality was guaranteed. Each interview lasted 5–10 minutes and was audio-recorded with permission. Recordings were transcribed verbatim, with original audio consulted to preserve nuances. To ensure consistency, the research team held regular feedback sessions during transcription and analysis. All data were stored securely in a password-protected private cloud accessible only to the researcher.

Data analysis

Interview transcripts were imported into ATLAS.ti 8 for qualitative analysis (Friesen, 2019). While transcripts provided the main basis for coding, original audio recordings were continually consulted to capture nuances of intonation, emphasis, and conversational flow that written text might omit (Rutakumwa et al., 2020). Thematic analysis followed Braun and Clarke's (2006) six-phase framework, beginning with systematic coding and progressing to the development of themes. Codes were grouped into broader categories, which were refined through literature-informed comparisons to ensure conceptual consistency. ATLAS.ti's direct audio-based coding feature enabled the integration of paralinguistic cues into the thematic

structure (Woods et al., 2016), enhancing interpretive accuracy and reliability.

The initial thematic structure underwent two rounds of expert validation (Srivastava & Hopwood, 2009). Based on feedback, redundant codes were removed, overlapping categories consolidated, and final adjustments made to ensure clarity and cohesion (Miles et al., 2014). The resulting thematic model was mapped onto Zumbo's ecological framework: top-level categories were derived deductively from its four layers, while subcategories emerged inductively from participant narratives.

Supplementary Table 2 provides illustrative quotations from each learner group with their assigned codes, categories, and ecological layers

Findings

In line with the research objectives, findings are presented separately for primary, middle, high school students, and adult learners. This classification reflects the assumption that each group is shaped by a distinct ecological background, influenced by curricular exposure, institutional structures, and developmental stage.

Thematic organization follows the four-layer ecological framework, with results presented in a bottom-up sequence beginning with primary school learners. Within each group, ecological variables shaping Turkish language learning are identified and discussed in detail.

Ecological Background of Primary School Students

Analysis of primary school participants yielded four overarching themes aligned with the ecological framework, comprising 28 categories: 2 under personal characteristics, 8 under school context, 10 under family and out-of-school environment, and 8 under national and cultural factors. At this level, students mentioned relatively few individual traits, but provided extensive reflections on environmental influences. Teacher-related factors, with six distinct categories underscoring the centrality of teachers in shaping young learners' perceptions of language learning. In the familial domain, heritage language use, bilingualism, and cultural transmission through sibling and parental interactions were prominent.

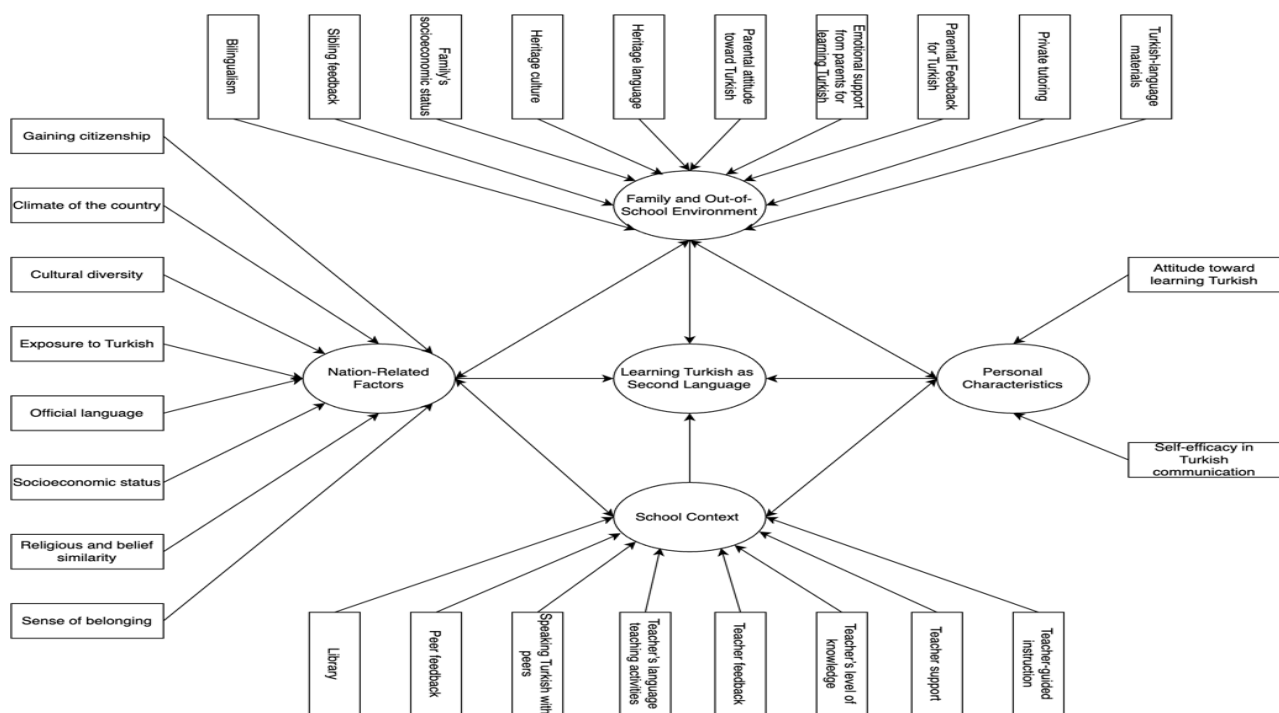


Figure 1. The ecological background at the primary school level

Socioeconomic factors—such as access to private tutoring and Turkish-language resources at home—also emerged as significant.

At the national level, students highlighted cultural familiarity with Turkish traditions and described Türkiye, especially Istanbul, as a supportive and livable environment for learning compared to their countries of origin. These findings suggest that while individual characteristics play a limited role for primary learners, ecological supports at school, home, and national levels substantially frame their learning experiences. A visual representation of these results is provided in Figure 1.

Following the visual model in Figure 1, illustrative quotations are presented to substantiate the categories across the four ecological layers. Drawn from semi-structured interviews, these excerpts align with the identified themes and capture how primary school learners describe the conditions shaping their Turkish language learning. A summary of representative quotations is provided in Table 2.

Table 2. Primary school related findings

Themes	Categories	References
Personal Characteristics	Attitude toward learning Turkish (f=4)	"Turkish is a beautiful language."
	Self-efficacy in Turkish communication (f=15)	"When I need to talk to people, I can speak."
	Peer feedback (f=3)	"My friends tell me when I make mistakes. I learn my errors."
School context	Speaking with peers (f=8)	"We have friends here. We speak Turkish."
	Library (f=2)	"Of course, the library helps. There are Turkish books. We read."
	Teacher's knowledge level (f=16)	"Our teachers at school know Turkish and teach us better."
	Teacher support (f=12)	"Our teachers support us a lot in class. They always want us to learn."
	Language teaching activities by the teacher (f=7)	"We play word games. It's fun."
	Teacher feedback (f=14)	"My teacher tells me when I make mistakes."
	Teacher-directed instruction (f=5)	"Our teacher tells us what to do. We learn."
	Family and Out-of-School	
	Family's socioeconomic status (f=8)	"My family can buy what is needed. Books, school supplies..."

Nation-related factors	Emotional support from parents (f=18)	"When I speak Turkish, my family is happy and supports me."
	Parental attitude toward Turkish (f=2)	"My mom and dad really wanted me to learn Turkish."
	Turkish materials at home (f=1)	"There are Turkish books at home. I can read."
	Bilingualism (f=1)	"Sometimes I speak another language. I don't use Turkish."
	Sibling feedback (f=4)	"My sister knows Turkish. She tells me when I make mistakes."
	Heritage language (f=6)	"My mom and dad have another language. We speak it at home."
	Heritage culture (f=2)	"Holidays can be different in our country. I have to act accordingly."
	Private tutor (f=5)	"Yes, I take private lessons."
	Religious and faith similarity (f=4)	"We have the same religion."
	Cultural diversity (f=1)	"There are very different people in Türkiye. From many countries."
	Level of prosperity (f=3)	"There are more opportunities in Türkiye."
	Official language (f=25)	"Turkish is spoken in Türkiye. That's why we must learn it."
	Sense of social belonging (f=5)	"It's warmer here. I like being in Türkiye."
	Exposure to Turkish (f=9)	"There is Turkish everywhere in Türkiye. We hear it. That's how we learn."
	Climate of the country (f=1)	"The climate in Türkiye is better."
	Obtaining citizenship (f=3)	"We want to get

The responses in Table 2 reflect primary school students' perspectives across the four ecological layers guiding this study. Within *personal characteristics*, students emphasized their attitudes toward learning Turkish and their self-efficacy in using the language for communication. These reflections reveal how early beliefs about competence shape motivation and highlight key psychometric variables that influence language acquisition.

In the *school and classroom context*, peers, resources, and especially teachers were identified as central factors. Students valued feedback from classmates and opportunities to practice Turkish with peers. Access to Turkish materials in school libraries was noted as helpful, but teachers stood

out as the dominant influence. Their subject expertise, ability to design engaging activities, and continuous support were frequently cited, underscoring young learners' reliance on teacher guidance.

The *family and out-of-school environment* also played a significant role.

compelling rationale for learning it, while aspirations for Turkish citizenship—often shared with family members—emerged as an important long-term motivator.

Ecological Background of Secondary School Students

Following the ecological framework, categories for

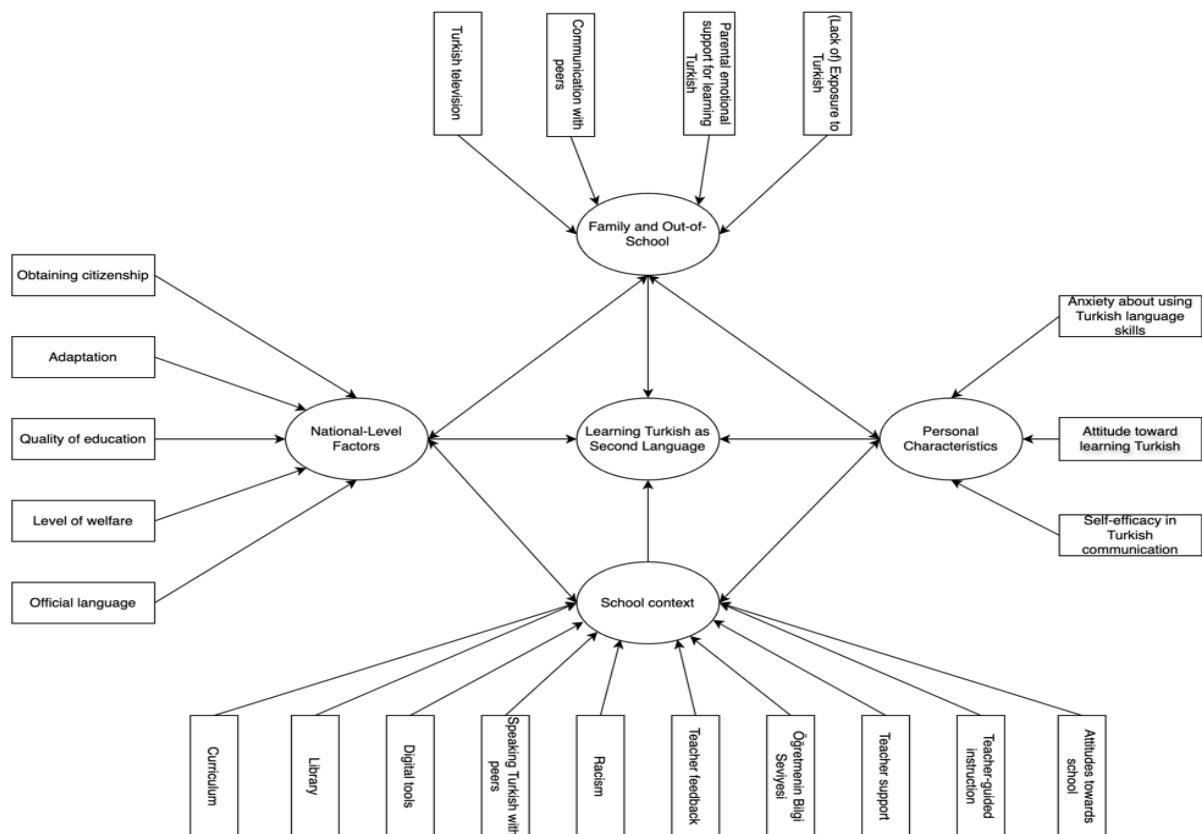


Figure 2. The ecological background at the primary school level

Families' economic capacity to provide materials or private tutoring supported learning, while parental encouragement reinforced motivation. Conversely, heritage language use, bilingual home environments, and culturally specific traditions often limited Turkish exposure, constraining opportunities for practice outside school.

At the *national and cultural level*, participants pointed to religious and cultural similarities with Türkiye as easing adaptation. Istanbul, in particular, was described as a supportive and resource-rich environment compared to their home countries. The official status of Turkish was cited as a

secondary school learners were organized into four themes: three under personal characteristics, ten under the school context, four within family and out-of-school environments, and five related to national-level variables. Compared to primary students, responses at this stage included fewer personal traits but a broader range of external ecological influences. The school context was the most densely represented, with four teacher-related categories alongside themes concerning material resources and peer interactions.

To illustrate the ecological patterns observed in the middle school data, representative quotations were matched with each category to highlight variables influencing Turkish language learning. These excerpts show consistent alignment with the four ecological layers of the adapted model. A

summary of findings, supported by direct student statements, is presented in Table 3.

Secondary school students' responses were distributed across four ecological themes. Within *personal characteristics*, three categories emerged: attitudes toward learning Turkish, self-efficacy, and language-related anxiety. While most students expressed positive views of Turkish and confidence in understanding it, some reported feeling shy or anxious when using their skills in public, reflecting early adolescent sensitivity to peer and social judgment.

Table 3. Secondary school related findings

Themes	Categories	Supporting Quote
Personal Characteristics	Anxiety about using Turkish language skills (f=1)	"Sometimes I feel shy when I use what I've learned or speak outside."
	Self-efficacy in Turkish communication (f=1)	"When Turkish is spoken, I understand."
	Attitude toward learning Turkish (f=7)	"I think Turkish is a good language."
School context	Attitudes towards school (f=3)	We have a good school.
	Speaking Turkish with peers (f=4)	"I go to class every day here and talk with my friends."
	Digital tools (f=1)	"Sometimes I use apps on the iPad that help me improve my Turkish."
	Racism (f=1)	"They hate us."
	Library (f=2)	"I can read books in the library."
	Curriculum (f=2)	"Sometimes we learn from the book, sometimes from class content. There's a system."
	Teacher's subject-matter expertise (f=5)	"I don't know some things. My teacher teaches what they know."
	Teacher support (f=7)	"My teacher helps a lot."
	Teacher feedback (f=4)	"Sometimes the teachers tell me my mistakes."
	Teacher-guided instruction (f=2)	"While teaching, the teacher writes on the board and tells us what to do."
Family and Out-of-School	Communication with peers (f=21)	"I have friends. I talk to them."
	Parental emotional support for learning Turkish (f=13)	"My family feels proud when I speak Turkish with other people."
	(Lack of) Exposure to Turkish (f=8)	"I speak Turkish with my sister. My family doesn't know Turkish."
	Turkish television (f=1)	"My mom watches Turkish TV."

Nation-related factors	Adaptation (f=13)	"I live here, and I need to speak Turkish in order to live."
	Quality of education (f=1)	"I came for a good education."
	Level of welfare (f=3)	"There are better job opportunities in Türkiye."
	Official language (f=21)	"They speak Turkish in Türkiye. That's why I need to learn it."
	Obtaining citizenship (f=2)	"We want to get citizenship."

The *school context* yielded the largest number of categories. Teachers were especially central, with students highlighting subject-matter knowledge, supportive behavior, guidance, and feedback as crucial to their progress. Curricular structure and access to school libraries also contributed positively, providing a sense of order and additional learning resources. Peer interactions within class reinforced language use, while digital tools such as tablet-based apps offered supplementary practice. However, experiences of racism were also noted, pointing to school climate as a barrier for some learners.

In the *family and out-of-school environment*, peer communication outside school was the most frequently mentioned factor, underscoring the importance of informal interaction. Parental emotional support, especially pride in children's ability to use Turkish publicly, reinforced motivation. Limited exposure at home, particularly when parents lacked Turkish proficiency, was cited as a challenge, although siblings sometimes provided practice opportunities. Turkish television was mentioned as an additional, though less frequent, source of language exposure.

At the *national level*, students emphasized the official status of Turkish as the primary reason for learning it, with adaptation needs in daily life strongly reinforcing this perspective. Broader motivators included the perceived quality of education, better economic opportunities in Türkiye, and long-term aspirations for citizenship. Together, these responses show that secondary school learners connect their language acquisition not only to immediate school experiences but also to wider goals of integration and future security.

Ecological Background of High School Learners

In line with the ecological framework, findings for high school students were grouped into four themes encompassing 24 categories: two under personal characteristics, nine in the school context, seven within family and out-of-school environments, and six at the national and cultural level.

provided a coherent structure for organizing the primary themes, while also accommodating unique subthemes that emerged from the narratives. Notably, mentions of perceived racism at the national level and references to Turkish-speaking communities abroad extended the framework, adding further depth to the ecological interpretation of students' language learning experiences.

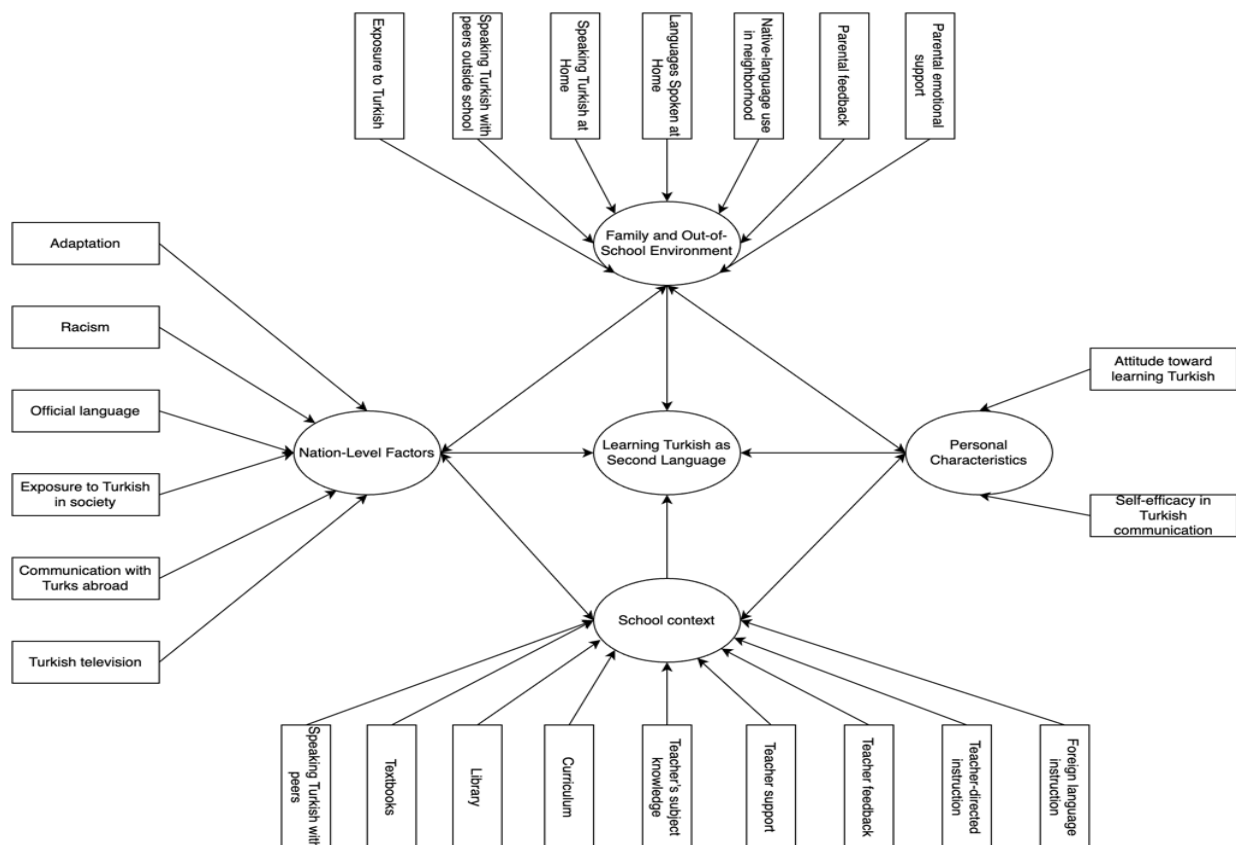


Figure 3. The ecological background of the high school learners

Compared to earlier stages, a shift in emphasis was evident—fewer categories were associated with the school setting, while national-level influences were more prominent. Nonetheless, the school context remained the most category-rich theme, underscoring its continued importance in shaping high school students' second language learning experiences.

The model derived from high school student data is illustrated through representative quotations in Table 4, which substantiate the identified categories across the ecological layers. These layers

Table 4. High school related findings

Themes	Categories	Supporting Quote
Personal Characteristics	Self-efficacy in Turkish communication (f=6)	"I am learning Turkish so that I can communicate."
	Attitude toward learning Turkish (f=2)	"Turkish is a wonderful language for me."
School context	Speaking Turkish with peers (f=2)	"Here, it is necessary to speak Turkish with friends."
	Textbooks (f=1)	"Yes, they give us textbooks at school. We learn from them."
	Library (f=2)	"They lend us books from the school library."

Family and Out-of-School	Curriculum (f=6)	"There are designated Turkish classes at school. We learn during those lessons."
	Teacher's subject knowledge (f=3)	"Our teachers know Turkish. They answer our questions. We learn from them."
	Teacher support (f=1)	"The teachers are very supportive at school."
	Teacher feedback (f=2)	"When I write or speak, the teacher corrects my mistakes."
	Teacher-directed instruction (f=2)	"During Turkish class, teachers tell us what to do. They lead the class and we learn."
	Foreign language instruction (f=2)	"There are foreign language classes at school. We learn alongside Turkish."
	Parental emotional support (f=3)	"My parents really want me to learn Turkish. They're happy when I speak it."
	Parental feedback (f=1)	"When I make mistakes (in Turkish), my mom and dad correct me."
	Native language use in neighborhood (f=1)	"I don't use much Turkish outside of school. In our neighborhood, we speak our own language."
	Speaking Turkish at Home (f=2)	"Sometimes we speak Turkish at home."
Nation-related factors	Speaking Turkish with peers outside school (f=4)	"I have friends outside of school. We chat in Turkish."
	Exposure to Turkish (f=7)	"Even outside of school, people always speak Turkish. We constantly hear it."
	Adaptation (f=14)	"We live in Türkiye. To live here, we must know Turkish."
	Racism (f=1)	"If someone silences me or attacks me for speaking my language, I must defend myself."
	Official language (f=10)	"Turkish is the language of Türkiye. That's why we must learn it."
	Exposure to Turkish in society (f=11)	"People speak Turkish everywhere in Türkiye."
	Communication with Turks abroad (f=1)	"There are many Turks living outside Türkiye—in Germany, the U.S., etc. You can speak with them."
	Turkish television (f=2)	"I learned from Turkish TV shows that are broadcast."

The findings from high school students revealed an emerging sense of agency and heightened social awareness in their experiences of learning Turkish as a second language. Many expressed a clear sense of purpose, particularly in relation to

communicative self-efficacy, emphasizing that Turkish was indispensable for both academic participation and daily interaction. Their generally positive attitudes—captured in descriptions of Turkish as a “wonderful language”—signal a deeper emotional investment and stronger internalization of learning goals compared to earlier developmental stages.

Although slightly fewer *school-related categories* were identified than at the middle school level, the institutional context remained the most prominent theme. Students highlighted curricular structures, textbooks, and formal Turkish classes, while continuing to portray teachers as central figures in the learning process. Teachers' subject knowledge, support, feedback, and directive guidance were frequently mentioned, reflecting the persistence of a teacher-led model in classroom dynamics. The concurrent presence of foreign language classes also pointed to multilingual school environments where Turkish functioned as one of several instructional languages. Peer interaction in Turkish was still seen as essential for everyday schooling.

Family and neighborhood environments exerted varied but influential effects. Emotional encouragement and correction from parents were valued, yet exposure to Turkish differed according to household language practices and neighborhood demographics. Some students reported daily opportunities to use Turkish at home and in their surroundings, while others lived in ethnolinguistic enclaves where heritage languages dominated. Informal peer networks outside of school often compensated for limited exposure, offering valuable spaces to sustain oral proficiency.

At the *societal level*, national influences provided a broader motivational frame. Students consistently cited the official status of Turkish and its ubiquity in public life as reasons for learning it, while Turkish-language media—especially television—was identified as an accessible input source. Distinctively, high school learners also referenced global Turkish-speaking communities and experiences of discrimination, reflecting a more critical engagement with language, identity, and social inclusion. These accounts suggest that high school students encounter second language learning not

only as an academic necessity but as a sociopolitical process embedded within layered ecological dynamics.

Ecological Background of Adult Learners

The four-layer ecological model was also effective in capturing the experiences of adult learners. Analysis identified three categories under personal characteristics, six related to the school context,

proximity to their homeland, professional aspirations, and cultural alignment, reflecting motivations and contexts that differ from those of younger learners. While the overarching ecological structure remained consistent across groups, the family and out-of-school environment layer required minor reorganization to more accurately capture the lived realities of adult participants.

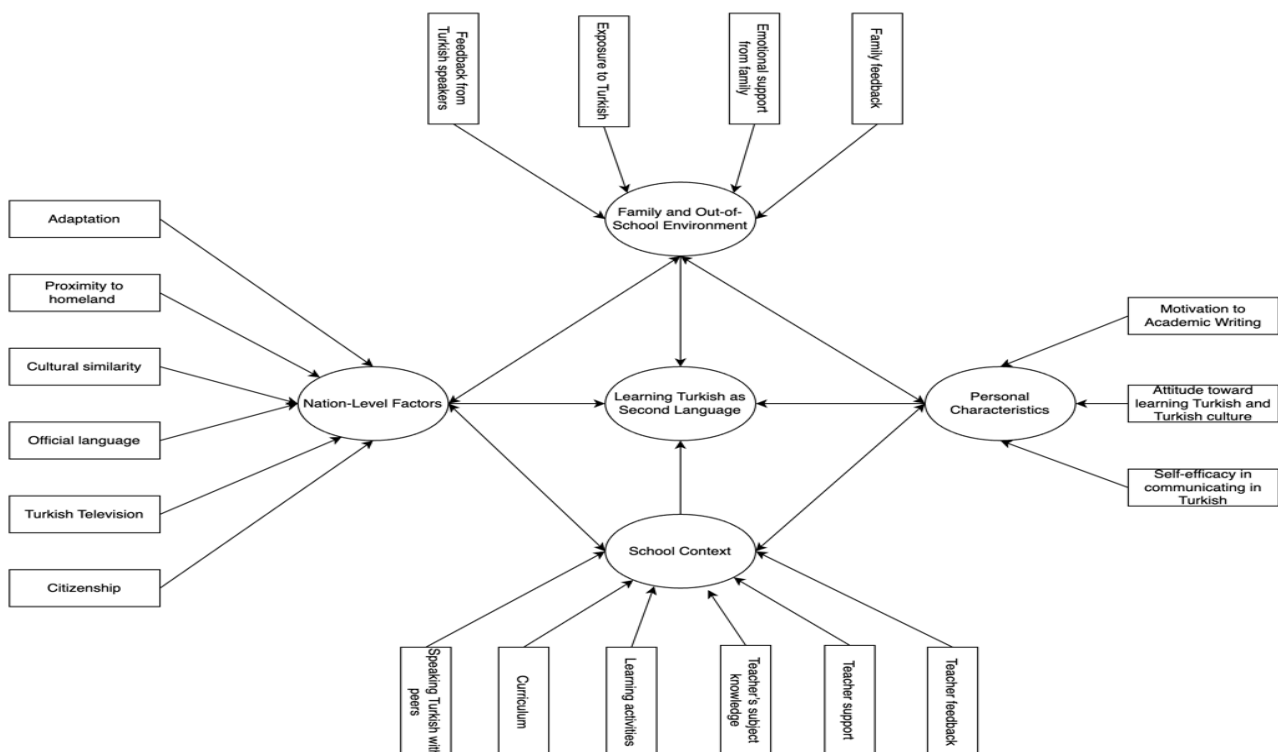


Figure 4. The ecological background of the adult learners

four concerning family and out-of-school environments, and six linked to national and cultural factors. Compared to other groups, adults contributed the richest set of responses in the personal domain, reflecting a heightened sense of self-awareness and individual variability in their learning trajectories. In contrast, the distribution of categories across the remaining layers was relatively balanced, suggesting that adult second language acquisition is shaped by a more even interplay of school, family, and societal influences.

The supporting excerpts that illustrate the ecological background of adult learners are presented in Table 5. As a distinct group, adults articulated categories shaped by themes such as geographic

Table 5. Adults related findings

Themes	Categories	Supporting Quote
Personal Characteristics	Motivation for academic writing (f=1)	"I am learning Turkish so that I can communicate."
	Attitude toward learning Turkish and Turkish culture (f=4)	"Turkish is a wonderful language for me."
	Self-efficacy in communicating in Turkish (f=3)	"I need to learn Turkish to read and speak in Turkish."
School context	Speaking Turkish with peers (f=2)	"I made more friends. I spoke Turkish with them."
	Curriculum (f=6)	"There is structured learning in any course. I believe it improved my language skills."
	Library (f=2)	"They lend us books from the school library."

	Curriculum (f=6)	"There are designated Turkish classes at school. We learn during those lessons."
	Learning activities (f=1)	"We did activities in the course to learn. These helped me improve."
	Teacher's subject knowledge (f=2)	"The teachers knew Turkish and were teaching while we were learning."
	Teacher support (f=1)	"The teachers were very supportive."
	Teacher feedback (f=1)	"When I made mistakes, my teachers corrected me. I learned a lot from them."
Family and Out-of-School	Family feedback (f=3)	"When I didn't know something, my family pointed out my mistakes and helped."
	Emotional support from family (f=6)	"My family gave me great support. My spouse came with me every day so I could attend the course."
	Exposure to Turkish (f=20)	"People frequently speak Turkish where I live. I hear it all around me."
	Feedback from Turkish speakers (f=1)	"Turkish people we chat with daily also point out my mistakes when I make them."
Nation-related factors	Adaptation (f=17)	"I don't think it's a choice. Anyone considering living in Türkiye should learn Turkish." "While I was in Egypt, I was learning the language (Turkish) of another country. Now that I'm in Türkiye, I learn the language (Turkish) to live here."
	Proximity to homeland (f=2)	"Türkiye is close to my home country. So I can visit my relatives easily."
	Cultural similarity (f=2)	"The cultural structure in Türkiye is very similar to ours. Its Islamic structure resembles my country."
	Official language (f=11)	"People speak Turkish in Türkiye. It is necessary to learn it."
	Turkish television (f=1)	"At home, I always turned on and watched Turkish TV. These served as examples for me."
	Citizenship (f=1)	"Türkiye has a similar culture and resembles Europe. Also, it is easier to get citizenship here."

The excerpts in Table 5 reveal how adult learners' trajectories are shaped by interconnected factors across all four ecological layers. At the *personal level*, participants displayed strong metacognitive

awareness and goal-directed behavior, particularly in their motivation to master academic writing and to engage with Turkish language and culture. Their confidence in communication emphasized a practical orientation toward functional language use in both professional and everyday contexts.

Within the *school environment*, adults valued structured curricula, peer interactions, and teacher expertise. Although more autonomous than younger learners, they still relied on teacher feedback and guided instruction, especially when aligned with academic or professional objectives. Distinct from earlier groups, they articulated explicit expectations for instructional quality, positioning schools as platforms for targeted linguistic advancement rather than general socialization.

In the *family and out-of-school ecological layer*, support from household members was central to sustaining formal language learning. Notably, this group reported the highest level of interaction with Turkish in neighborhoods and social interactions. This suggests a porous boundary between institutional learning and informal contexts, with adults consistently extending classroom learning into daily life.

At the *national level*, participants highlighted Turkish as essential for adaptation, civic integration, and long-term settlement goals, including citizenship. Cultural proximity and the practical advantages of living in Türkiye were frequently cited, while Turkish media, especially television, functioned as a supplementary source of both linguistic input and cultural orientation. Together, these findings demonstrate how adult learners actively integrate personal goals, institutional resources, familial support, and societal opportunities into an ecologically coherent learning process.

Discussion

This study explored the ecological background of learning Turkish as a second language across four educational stages—primary, middle, high school, and adult learners—through Zumbo's adapted ecological framework. By structuring findings across the four ecological layers—personal charac-

teristics, school and classroom environment, family and out-of-school setting, and national-cultural factors—the analysis revealed both shared and stage-specific patterns shaping learners’ experiences. This layered interpretation highlights how contextual variables interact across developmental periods, offering a nuanced account of second language acquisition within migration-affected and multilingual contexts. In the following sections, each learner group is discussed in turn, with emergent findings connected to relevant theoretical and empirical insights.

Discussion of Primary School Findings

The findings at the primary school level highlight motivation—particularly self-efficacy and positive attitudes toward learning Turkish—as meaningful variables within the innermost ecological layer. These results reinforce the argument that affective and belief-oriented factors are foundational at early stages of second language acquisition and should be central to instructional design (Kim & Kim, 2025). Pedagogical practices that explicitly nurture these dispositions may foster sustained engagement and long-term motivation.

Within the school layer, teachers emerged as the most influential ecological factor. Students often interpreted their learning progress through teacher guidance, suggesting that educators act not only as facilitators but also as primary models of language use. This finding resonates with frameworks emphasizing gradual release of responsibility (Fisher & Frey, 2021; Turkish Maarif Foundation, 2020), teacher expertise and the use of structured activities—such as repetition, error correction, and language games—appeared to directly shape early acquisition processes (Zhang & Zou, 2024). The prominence of this theme indicates that classroom interactions remain pivotal in cultivating early linguistic competence.

The family and out-of-school layer further underscored the importance of socioeconomic resources, availability of Turkish-language materials, and parental encouragement. These findings confirm prior research on how home literacy environments influence motivation and academic success (Dong & Chow, 2022; Liu & Chung, 2024). Although younger learners exercise limited agency,

their home contexts substantially determine opportunities for practice and reinforcement.

At the national level, students emphasized the official status of Turkish and expressed perceptions of cultural proximity. They associated the language with belonging and societal integration, reflecting an emergent awareness of its symbolic and practical role in adaptation. This observation aligns with studies showing that cultural alignment enhances motivation and smooths the adjustment process (Amit & Bar-Lev, 2015; De Jong et al., 2023). Collectively, the findings illustrate how all four ecological layers converge to support early Turkish language development, underscoring the interdependence of individual, classroom, familial, and societal influences during the initial years of formal education.

Discussion of Secondary School Findings

The findings from secondary school students reveal an evolving ecological profile in Turkish language learning. Within the personal characteristics layer, both enabling and constraining variables emerged. While expressions of self-efficacy (Sun et al., 2021) and positive attitudes toward learning Turkish (Kardoğan, 2025) were consistent with the primary school group, the appearance of language-use anxiety marked a developmental shift. This affective dimension suggests that increasing cognitive and social awareness during adolescence heightens sensitivity to performance and peer perception (Oakley, 2004). Although many themes mirrored those observed at the primary level, this added nuance underscores the need to address emotional factors within curriculum design and classroom practices for adolescent learners.

In the school and classroom context, teacher-related variables remained central. Students reported benefiting from teachers’ subject knowledge, supportive behaviors, and feedback (Brown & Lee, 2025). Additionally, references to peer interaction and digital tools illustrate that learning extended beyond teacher-centered practices into more dynamic, resource-based environments (Schwartz & Deeb, 2021; Zhao & Lai, 2023). The recognition of curricular structure in student responses reflects a growing awareness of planned instruction. However, the emergence of racism as

a category represents a critical challenge. Expressed through perceptions of being disliked or unwelcome due to linguistic background, this theme resonates with studies showing that even subtle hostility can diminish participation and motivation (Er & Durmuş, 2021). These findings highlight the importance of fostering emotionally safe learning spaces that affirm learners' linguistic identities.

The family and out-of-school environment continued to exert influence. Peer communication beyond school was frequently cited, underscoring the reinforcing role of informal interactions in consolidating formal input (Lin, 2023). Emotional support from parents and siblings was also noted, though exposure to Turkish remained uneven, particularly in monoethnic or heritage-language-dominant neighborhoods (Morali, 2018; Toprak Ay & Göktentürk, 2023). These linguistic enclaves may limit opportunities for immersion and, when considered alongside reported experiences of racism, highlight significant ecological barriers to sustained language practice.

At the national and cultural level, distal but powerful motivators shaped learners' perspectives. Turkish was framed as essential for adaptation, with strong links to instrumental goals such as educational attainment, improved quality of life, and citizenship. This configuration of motivators illustrates how broader sociopolitical realities influence learners' internal goal structures (Darvin & Norton, 2023). Collectively, the findings suggest that the ecology of language learning at the secondary level is shaped not only by classroom and family dynamics but also by sociocultural forces that define both immediate constraints and long-term aspirations.

Discussion of High School Findings

The findings from high school students indicate a continuation of motivational dynamics observed at earlier stages, with self-efficacy and positive attitudes toward learning Turkish remaining central personal characteristics. Unlike the middle school group, anxiety around language use did not emerge as a prominent theme, suggesting either

greater affective regulation or improved adaptation to Turkish-speaking contexts. These results reaffirm that motivation-related personal variables remain influential throughout compulsory education, underscoring the importance of systematically incorporating them into second language instructional planning (Pawlak et al., 2025).

The school context continued to represent the richest ecological layer, though with a notable shift in emphasis. Students highlighted curriculum-embedded practices, particularly the role of textbooks, as central to their progress (Risager, 2021). References to structured exposure, vocabulary development, and inductive grammar learning confirmed the utility of curricular materials. Teacher expertise, feedback, and classroom guidance were again cited as critical supports, reinforcing the teacher's role as a primary facilitator (Brown & Lee, 2025). Additionally, the emergence of foreign language instruction as a contextual category revealed that Turkish was being acquired in multilingual school environments. This exposure to multiple languages may support metalinguistic awareness and cross-linguistic transfer, enriching the overall learning process (Toprak Ay & Göktentürk, 2023).

Family and out-of-school factors echoed previously observed patterns while reflecting the unique circumstances of older learners. Emotional encouragement from parents and home-based feedback remained significant, but exposure to Turkish varied widely depending on household and neighborhood language practices. Students residing in ethnolinguistic enclaves reported reduced opportunities for Turkish immersion, suggesting that high school learners—like their younger peers—can be constrained by localized language islands within urban Türkiye (Cheng & Zhou, 2023; Toprak Ay & Göktentürk, 2023). These findings emphasize the continued importance of examining ecological contexts at a neighborhood level.

At the national layer, high school students associated Turkish language learning with adaptation, integration, and social participation. However, racism emerged differently than at the middle school level. Rather than primarily reporting emotional

perceptions of being disliked, participants described overt hostility, including verbal attacks and social confrontations linked to heritage language use. In this context, learning Turkish was framed as a protective strategy—necessary not only for integration but also for reducing vulnerability in public spaces. This finding aligns with research demonstrating that defensive motivations can drive language acquisition in contexts marked by discrimination (Masson et al., 2022). Turkish-language media, particularly television, was again cited as a supplemental input channel (Montero Perez, 2022). Additionally, some participants referenced contact with Turkish-speaking communities abroad, reflecting a broadened perception of Turkish as a global language (Boeschoten, 2022). Collectively, these findings demonstrate that high school students experience Turkish language learning as both a local necessity and a globally relevant skill within a multilayered sociocultural context.

Discussion of Adult Learner Findings

The findings for adult learners reveal a distinct ecological profile shaped by their professional goals, cultural orientation, and targeted learning objectives. Within the personal layer, participants expressed motivations extending beyond everyday communication, focusing on academic Turkish—particularly for employment or higher education (Karatay et al., 2019; Sağlam et al., 2022). This reflects a goal-driven approach shaped by institutional and career demands. Positive attitudes toward the Turkish language and culture, combined with strong communicative self-efficacy, suggest an intentional investment in both linguistic mastery and cultural integration. Many participants noted cultural proximity as an advantage, reinforcing adaptation to life in Türkiye (Flores et al., 2025; Yazıcı & Göktentürk, 2020).

In the school and instructional context, structured curricula, teacher expertise, and formal learning activities were consistently highlighted as central to progress. Institutions such as TÖMER and DİLMER appeared well-positioned to meet the advanced needs of adult learners (Şimşek & Bozkırlı, 2024). The teacher's role remained critical, underscoring the importance of specialized peda-

gogical training for adult second language instruction. The repeated emphasis on curricular coherence also demonstrates how standardized, purpose-driven materials effectively support this group's outcomes (Yıldız Yalçın & Özdemir, 2025).

Out-of-school factors further reinforced formal learning. Daily interactions, spousal encouragement, and corrective feedback from family members sustained engagement and facilitated authentic use of Turkish (Sorenson Duncan & Paradis, 2020). As in younger groups, frequent engagement to the language outside the classroom emerged as a decisive factor for long-term retention and proficiency.

At the national level, adult learners identified citizenship, adaptation, and cultural-religious familiarity as strong external drivers (Alkan, 2022; Dönmez Kara, 2015). Turkish proficiency was widely regarded as essential for civic participation and integration, while references to accessible citizenship pathways and geopolitical proximity highlighted the influence of macro-level conditions. Collectively, these findings suggest that adult learners benefit most when ecological layers align—when institutional support, cultural continuity, and everyday exposure converge to sustain motivation and foster meaningful linguistic development.

Conclusion

This study investigated the ecological background of learning Turkish as a second language across four educational levels—primary, secondary, high school, and adult learners—through Zumbo's ecological framework. Findings confirm that acquisition is shaped by interdependent variables nested within four ecological layers: personal characteristics, school context, family and out-of-school environment, and national-cultural factors. Across groups, consistent facilitators included exposure to Turkish, supportive instructional settings, and positive perceptions of Turkish culture. Teachers emerged as central agents, while family support and sociocultural alignment further reinforced learners' engagement. At the same time, heritage languages, neighborhood environments, and differing degrees of immersion critically influenced the learning process.

Layer-specific distinctions highlighted developmental shifts. Primary school learners benefited most from structured, teacher-centered practices, while secondary and high school students showed heightened sensitivity to curriculum design, peer interactions, and sociocultural barriers such as discrimination. Adult learners, by contrast, demonstrated explicitly goal-driven motivations tied to academic advancement, professional aspirations, and civic integration, with institutional programs and citizenship pathways playing decisive roles. Taken together, these findings demonstrate that applying an ecological lens to Turkish as a second language is not only useful but essential. Attending to learners' lived realities through in vivo insights enables educators and policymakers to design language programs that are contextually grounded, socially responsive, and developmentally appropriate across the lifespan.

Limitations, Implications and Future Studies

This study has several limitations. First, as a qualitative inquiry, findings are context-specific and cannot be generalized beyond the four learner groups examined. Second, the data represent a single point in time; future changes in learners' circumstances may yield different outcomes (Van Der Stede, 2014). Third, the study focused exclusively on learners of Turkish as a second language within Türkiye, excluding the distinct dynamics of teaching Turkish as a foreign language abroad. Fourth, while participants identified ecological variables that shaped their learning, this study did not examine causal relationships among them. Finally, although the coding structure generated meaningful insights, additional variables may emerge in future research, broadening the ecological account of second language learning.

Despite these limitations, the study offers several implications. Applying an ecological lens provides valuable insights for researchers, educators, and policymakers by showing how contextual variables shape learners' emotional, motivational, and social profiles. For secondary school learners, the emergence of anxiety underscores the need for culturally responsive instruction and confidence-building strategies. Across all levels, the central

role of teachers highlights the importance of specialized training programs for educators working with second language learners in Türkiye.

The prominence of motivation—both personal and family-related—signals the need for further research into motivational foundations and robust needs analyses to align instruction with learners' goals. Instructional materials should also be empirically informed, tailored to learners' academic and personal interests, and supported by intervention-based development. At a broader scale, the absence of national data infrastructures comparable to PISA or PIRLS constitutes a critical gap. Establishing a longitudinal database to monitor both linguistic and psychosocial dimensions of second language learners would provide a stronger foundation for research and policy planning.

Future studies could build on these findings through mixed-methods or quantitative approaches, such as structural equation modeling, to test the interplay of ecological factors. Embracing an ecological framework thus offers a flexible and context-sensitive pathway for advancing Turkish as a second language education, particularly within migration-influenced national contexts.

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Informed Consent: *Informed consent was obtained from all adult participants and from the legal guardians of minors. Confidentiality and anonymity were maintained throughout the study in accordance with institutional and international guidelines.*

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RESEARCH ARTICLE

Correlates of Juvenile Delinquency: A Study on Internet Usage, Family Functioning, and Social Prestige

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Abstract

Increased internet use is associated with changes in family structure and sociocultural values. These changes have a significant direct and indirect impact on juvenile delinquency. It has been observed that internet use in general, and social media use in particular, weakens social ties, leading to disintegration in the social structure and increasing individuals' tendency towards loneliness. It is particularly noteworthy that factors such as changes in family structure brought about by social media, the increase in divorce rates, and the shift and loss of values have a significant impact on the rise in juvenile delinquency. The relationship between these factors and juvenile delinquency is not linear, but rather a reciprocal sociocultural interaction resulting from the intertwining of these factors. This study analyzes the relationships between social factors and the number of juvenile delinquency in Türkiye. Using data from the Turkish Statistical Institute (TÜİK) covering the years 2009–2024, the relationships between the number of children involved in crime and the internet usage rate, divorce rate, and the importance given to factors that contribute to social prestige were evaluated through correlation analysis. According to the analysis results, positive and significant relationships were found between the number of children involved in crime and internet usage rates, divorce rates, and the importance placed on money. In contrast, a negative and significant relationship was identified between the importance placed on moral lifestyle and involvement in crime. The findings highlight the connection between changes in social values and children's involvement in crime.

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Keywords: juvenile delinquency, internet use rate, divorce rate, prestige, family

Öz

İnternet kullanımının artması, aile yapısında ve sosyo-kültürel değerlerde değişikliklerle ilişkilidir. Bu değişikliklerin doğrudan veya dolaylı olarak çocuk suçluluğuna etkisi çok büyüktür. Genelde internet kullanımının özelde sosyal medya kullanımının toplumsal bağları zayıflatarak sosyal yapıda çözümlere sebep olduğu ve bireylerin yalnızlaşma eğilimini artırdığı gözlenmektedir. Özellikle sosyal medyanın aile yapısında meydana getirdiği değişiklikler, boşanma sayısındaki artış ve değerlerde meydana gelen değişim ve yitim gibi faktörlerin çocuk suçluluğunun artışında önemli düzeyde etkisi olduğu dikkat çekmektedir. Çocukların suça sürüklenmesi ve bu faktörler arasındaki ilişki doğrusal olmaktan ziyade bu unsurların iç içe geçmesi sonucu oluşan karşılıklı bir sosyo-kültürel etkileşimdir. Bu çalışma, Türkiye’de suça sürüklenen çocuk sayısı ile bazı toplumsal faktörler arasındaki ilişkileri incelemektedir. Türkiye İstatistik Kurumu’nun (TÜİK) 2009–2024 yıllarını kapsayan verileri kullanılarak, suça sürüklenen çocuk sayısı ile internet kullanım oranı, boşanma sayısı ve toplumda itibarlı olmayı sağlayan nedenlere verilen önem arasındaki ilişkiler korelasyon analizi yoluyla değerlendirilmiştir. Analiz sonuçlarına göre, suça sürüklenen çocuk sayısı ile internet kullanım oranı, boşanma sayısı ve paraya verilen önem arasında pozitif ve anlamlı ilişkiler bulunmuştur. Buna karşılık, ahlaklı yaşama verilen önem ile suça sürüklenme arasında negatif ve anlamlı bir ilişki tespit edilmiştir. Düzgün aileye verilen önem ile suça sürüklenme arasında ise anlamlı bir ilişki bulunamamıştır. Bulgular, toplumsal değerlerdeki değişim ile çocukların suça sürüklenmesi arasındaki bağa dikkat çekmektedir.

Anahtar Kelimeler: çocuk suçluluğu, internet kullanım oranı, boşanma oranı, itibar, aile

Introduction

Recent academic studies have revealed that juvenile delinquency is on the rise today (Abhishek & Balamurugan, 2024; Ahmed & Murtaza, 2016; Shali, 2017; Surong & Lyngdoh, 2020; Vishwakarma & Awasthi, 2025; Young et al., 2017). The reasons for this increase are being debated both in Türkiye and globally, and judicial systems are even reducing sentences for juvenile offenders in light of social factors contributing to their criminal behavior. On the other hand, following the murder of Mattia Ahmet Minguzzi by children on January 24, 2025, public perception shifted toward the notion that “even children are criminals”, prompting greater scrutiny of the leniency shown toward juvenile offenses. Consequently, juvenile delinquency is gaining increasing social and academic significance across various dimensions. Due to the fact that crimes committed by children are deeply linked to social structures, the terms “children driven to crime” or “children pushed into crime” have come to the fore in doctrine (Gökpınar, 2007, p.208).

The widespread use of the internet in the digital era has made people's lives easier, but it has also brought risks. It has been observed that internet use in general, and social media use in particular, weakens social bonds, causes social breakdown, and increases the tendency of individuals to become isolated. The rate of internet usage, which influences children's involvement in crime, is not linearly related to factors such as the increase in divorce rates and changes and losses in values, but rather there is an intertwined, reciprocal socio-cultural interaction between these elements. Numerous factors, from the changes social media has brought about in family structures to shifts in socio-cultural values, and the changes within these elements, play a significant role in the increase in juvenile delinquency.

Various studies conducted in different countries have revealed the relationship between social media and juvenile delinquency. While facilitating communication and information access, excessive internet and social media use can weaken social bonds, disrupt family relationships, and increase adolescents' vulnerability to criminal behaviors (Cai, 2024; Mojares et al., 2015, p.585; Shali, 2017;

Surong & Lyngdoh, 2020, pp.1271–1272; Vishwakarma & Awasthi, 2025, p.3898). Peer pressure, exposure to content related to drug use, violence, and cyberbullying, and adolescents' limited capacity to comprehend complex social relationships contribute to both victimization and engagement in deviant behaviors (Vishwakarma & Awasthi, 2025, p.3898). Social media use is integrated into almost all daily activities, reinforcing connectivity while simultaneously increasing exposure to risky content (Shali, 2017). In addition to the overall rise in social media use, the type of digital content that children are exposed to also plays a critical role. Studies show that violent video games (Anderson & Bushman, 2001), online gambling (Messerlian et al., 2004), pornographic materials (D'Alborton & Scardovi, 2021), and risky online challenges (Livingstone & Haddon, 2008) have been linked to behavioral and psychological problems in youth.

Values, defined as a set of ideas that determine which behaviors are accepted or rejected by society, whether they are moral or immoral, right or wrong (William E. Thompson, 2011, p.65), determine what society considers important. Values create the behaviors that are considered valuable or the goals that are desired to be achieved, and they influence behavioral patterns. According to the Life Satisfaction Survey conducted by the Turkish Statistical Institute (TÜİK), “decent family” and “moral lifestyle” are among the most prestigious values in Turkish society (TÜİK, 2025b). However, recent trends indicate a decline in the importance assigned to these values, while the value placed on money has increased-though not yet to a dominant level. Shifts in what society considers honorable or prestigious are often shaped by broader socio-economic developments. For example, even in traditional societies where divorce was once taboo, divorce rates have rapidly increased. Socio-cultural and economic factors such as urbanization, women's participation in the workforce, and rising education levels are often cited as the primary causes of this trend (Sheykhi, 2020, p.122). Changes in societal prestige, accelerated by socio-economic factors and digital influences, can shape motivations for deviant behavior. Online content and social media interactions have been linked to declining moral values, exposure to idealized lifestyles,

and normalization of risky behaviors (Alanka & Cezik, 2016; Korkunç & Aydemir, 2025; Utma, 2018; Young et al., 2017).

In addition, individualization, pressure between married couples, and changes in cultural factors such as values and attitudes are also thought to contribute to the increase in divorces (Wagner, 2020, p.43). Family structure and dynamics are central to understanding juvenile delinquency. Quantitative and meta-analytic studies demonstrate that family conflict, lack of supervision, divorce, and neglect contribute significantly to children's involvement in crime (Aazami et al., 2023; Javed et al., 2012, p.196; Price & Kunz, 2003). Parenting strategies, including proper guidance and supervision, mitigate the risks posed by social media exposure (Surong & Lyngdoh, 2020, pp.1271–1272). Furthermore, social media addiction can indirectly exacerbate family instability, increasing divorce rates and disturbing children's value systems (Akarsu et al., 2023; Güleç, 2018; Şentürk Dizman, 2019; Stomer et al., 2024; Widi-antari et al., 2019; Yener, 2021; Yüce & Yaman, 2022). According to a study conducted in the United States, couples with lower marital satisfaction use social media more frequently (McDaniel et al., 2017).

Some studies have also identified positive effects. A quantitative study conducted with Italian families with adolescent children reveals that social media affects perceptions of the family depending on the family structure, and that social media can have a positive effect on strong and supportive families, meaning that it does not always have a negative impact (Procentese et al., 2019). However, most findings emphasize the negative impact on adolescents' worldviews. Adolescents' relationship with social media significantly affects their outlook on life. According to Mojares et al. family (2015, p.583), adolescents feel socially disconnected without their phones, as if they lack friends or family. Having their cell phones with them at all times ensures that their connections to social networks remain unbroken. Social media accompanies them in almost all their daily activities. Young people who start spending time on social media as soon as they get out of bed in the morning

interact on social media while going to the bathroom, waiting for the bus, shopping, and even while listening to lectures.

The literature in Türkiye on juvenile delinquency spans sociology (Bilican Gökkaya, 2022; Özalp, 2024), psychology (Korkmaz & Erden, 2010), medicine (Çoban & Önder, 2021; Özbek et al., 2025), media studies (Doğan, 2022), criminology (Topçuoğlu, 2014), and law (Kitapçioğlu Yüksel, 2024; Lokmanoğlu et al., 2024; Yener, 2021). These works address reducing juvenile delinquency, technology addiction, the factors behind juvenile delinquency, and legal aspects for juvenile justice.

Korkmaz and Erden (2010), in their study examining factors related to juvenile delinquency, state that familial, child-related, and environmental factors contribute to delinquency. They highlight that the structural, economic, and educational characteristics of the family; the child's psychological state, employment status, and environmental factors such as economic conditions, peers, and media play a significant role in pushing children toward crime. Bilican Gökkaya (2022), in her study examining the causes of juvenile delinquency, identifies the family as the most prominent factor and emphasizes that disadvantages stemming from the family can be mitigated through cooperation between schools, social services, and the state. In a study on children receiving psychiatric care as part of criminal cases, Özbek et al. (2025) find that factors influencing repeat offending among children include drug use, parental divorce, and a family history of criminal behavior. Özalp (2024), who studies juvenile delinquency in the context of social change, reveals that the uncontrolled use of social media, along with technological developments in recent years, and the violent images children are exposed to in computer games and on television have an impact on children's involvement in crime. Similarly, Lokmanoğlu, Çakmakkaya, Altun, and Yıldırım (2024), who examine juvenile crime in the context of social media, state that children exposed to content involving violence, sexuality, and crime tend to normalize such actions, thereby becoming both victims and perpetrators of crime. In his qualitative study, which conducted a descriptive analysis of news articles and comments published in

digital media regarding children drawn into crime, Doğan (2022, p.699) states that the manner in which news is presented contributes to the stigmatization and marginalization of children drawn into crime. The labeling theory states that labeling deviant behavior causes individuals to accept their own guilt and commit new crimes (Triplett & Upton, 2015). Therefore, stigmatization and marginalization through social media may increase the likelihood of children being drawn into crime and repeat offenses. After presenting the extent of juvenile delinquency in Türkiye with official statistics, Topçuoğlu (2014) emphasizes the importance of a risk-focused prevention strategy to reduce the number of children drawn into crime. Ateş and Saluk (2018), through a descriptive analysis of demographic and geographical profiles of children driven to cybercrime based on TÜİK data and stated that basic information about such children is a critical step in crime prevention. Kitapçioğlu Yüksel (2024), who examines the position of juvenile offenders within the judicial process and the reasons for their involvement in crime, states that a criminal law specific to children should be established and that, rather than criminal discounts, protective and supportive measures should be provided to children to prevent them from being drawn into repeat crimes.

When examining the literature on juvenile delinquency in Türkiye, it becomes apparent that the primary focus has been on identifying the contributing factors. Some of these studies investigate the factors influencing juvenile delinquency and their interrelations through various analytical approaches. However, many of these rely on data collected through specific scales (Çetin & Özyürek, 2023; Özbek et al., 2025), which often limits the generalizability of the findings due to their focus on particular groups. In contrast, this study utilizes nationally representative data from the Turkish Statistical Institute (TÜİK), providing a broader context for understanding juvenile delinquency at the national level. This study aims to explore the relationship between national-level trends in internet usage and juvenile delinquency in Türkiye, based on aggregated official statistics. The analysis is conducted at the population level and does not imply individual-level causality. Using correlation

analysis, the study examines the direct relationship between internet usage and juvenile delinquency, as well as the indirect associations through internet-related factors such as divorce rates and changes in the societal determinants of prestige (i.e., decent family, moral lifestyle, and money). In doing so, this research aims to provide an original contribution to the literature.

This study was conducted within the framework of routine activity theory. Routine activity theory posits that crime occurs when three elements—motivated offenders, suitable targets, and the absence of capable guardians—converge in time and space (Cohen & Felson, 1979). The increase in internet use shifts children's routines from the physical world to the digital environment, reducing effective supervision while increasing their exposure to potential targets. This study extends the theoretical framework in question not only in the context of the relationship between digitalization and daily routines, but also in terms of social values. The prestige conferred by values such as the decent family life and moral lifestyle encourages individuals to engage in behaviors consistent with family ties and social norms in their daily routines, while the prominence of money as a source of prestige increases individuals' focus on economic success and material gain as a means of achieving status. This situation can lead to differentiation in motivation and opportunity for crime. Therefore, prestige variables have been included in the analysis in line with routine activity theory to understand which social values shape individuals' routine activities. Changes in daily routines, family dynamics, and value systems interact to shape the risk of juvenile delinquency. This theoretical perspective, linking digitalization and social change to patterns of juvenile delinquency, forms the basis of the present study.

Data and Methodology

This study is correlational design research using quantitative methods to identify the relationship between children involved in crime in Türkiye and variables such as internet usage rate, divorce rate, and the most valued reasons for gaining prestige

in society. This study did not cover structural factors known to be associated with juvenile delinquency, such as educational level, poverty, unemployment, or migration. The main reason for this is that the study focused on digitalization, changes in family structure, and social values. Furthermore, while factors such as education and income have been extensively studied in the literature for their impact on crime, more recent indicators directly related to social transformation—such as the rise in internet usage, divorce rates, and values that confer social prestige—have been relatively neglected in the context of Türkiye. Therefore, this study aims to present a framework that intersects with new areas of discussion in the sociology of crime, leaving traditional socio-economic factors aside.

Data published by the Turkish Statistical Institute (TÜİK) for the period 2009-2024 were organized and analyzed. The statistics on children who came to or were brought to the security units for various reasons were obtained from TÜİK (TÜİK, 2014, 2015, 2025a). From the Child Statistics on Security and Justice, the indicator used was the number of incidents involving children who were brought to or referred to security units, and among the reasons for referral, the category of “being driven into crime” was selected. For internet usage rate of individuals, the table showing *the internet usage rate of individuals by gender from 2004 to 2024* was used from TÜİK’s *Household Information Technology Usage Statistics* data (TÜİK, 2024c). Divorce statistics were obtained from *the Marriage and Divorce Statistics* database (TÜİK, 2024a). Finally, the table titled *The Most Important Reason for Being Prestigious in Society* from the *Life Satisfaction Survey* was used (TÜİK, 2025b).

This study examines the relationship between the number of children involved in crime and several social factors including the internet usage rate, the divorce rate, the importance given to a decent family life, which is considered the most important factor in gaining prestige in society, the importance given to moral lifestyle, and the importance given to money, which has been increasing since 2020. There are two main reasons for selecting the variables decent family, moral lifestyle, and money as prestige indicators. First, these values are among the indicators regularly measured in the Turkish

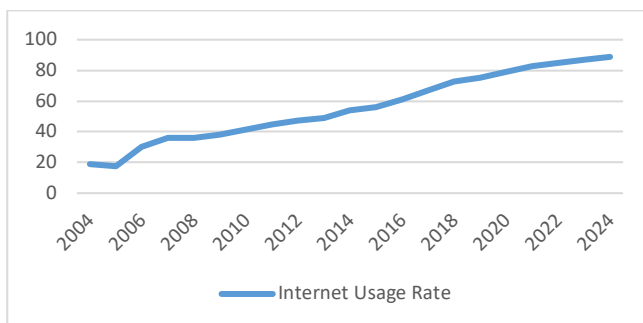
Statistical Institute’s (TÜİK) social values surveys and provide reliable time series spanning many years. Second, these values are directly linked to discussions of social norms and cultural capital associated with juvenile delinquency. The variables of decent family and moral life point to the central role of family and morality in maintaining social control and normative order, while the variable of money shows that individuals establish their status and prestige through economic capital. In the sociology of crime literature, it is argued that changes in social values can influence criminal behavior, particularly in societies where economic gain is foremost and opportunity structures and routine activities differ. Therefore, these variables have been included in the analysis as indicators consistent with both the theoretical framework and social change in the Turkish context.

The data were analyzed using version 2.5.4 of the Jamovi statistical analysis software. Before conducting the correlation analysis, the normality of the variables was assessed using the Shapiro-Wilk test. The results indicated that the data met the assumption of normal distribution. Consequently, Pearson correlation analysis was performed to test the direction and strength of the relationship among variables.

Findings

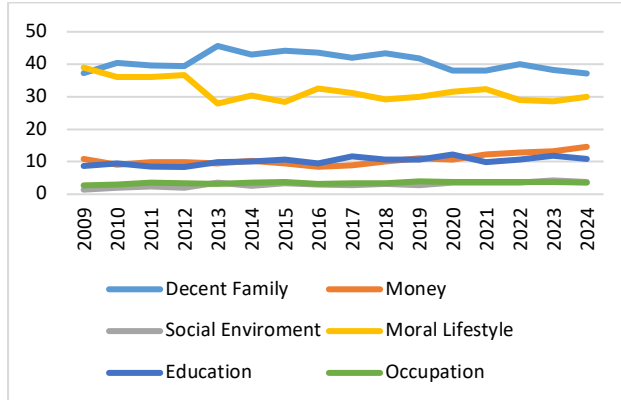
As is the case worldwide, the rapidly increasing use of the internet in Türkiye has been associated with various social dynamics. Graph 1 below shows the rise in internet usage in Türkiye since 2004. The study primarily focuses on internet usage rates, as data on social media usage is only available for 2021 and 2024. According to the Turkish Statistical Institute’s (TÜİK) Survey on the Use of Information Technologies Among Children, 31.3 % of children aged 6-15 used social media in 2021 (TÜİK, 2021), while this rate increased to 66.1% in 2024 (TÜİK, 2024b). Therefore, there has been an increase of approximately 111% in social media use among children within three years. This finding shows that the increase in internet usage is associated with social media usage and points to a rapid transformation in the nature of children’s online activities.

It can be said that many different aspects of life, from family structure to lifestyle and ways of thinking, have been affected by internet usage. The values cherished by society play a key role in shaping social behavior and expectations. When examining the reasons for being prestigious in society and the graph of change, it can be inferred that the digitalization of society has had a significant impact on this transformation.



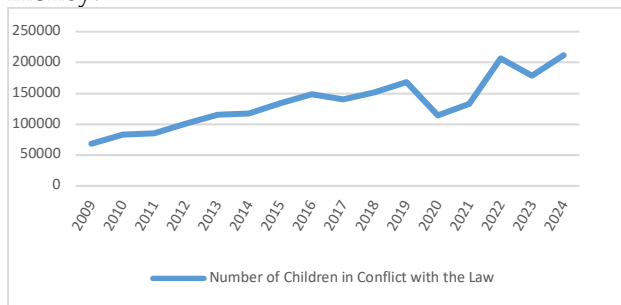
Graph 1. Internet Usage in Türkiye by Year
(Source: TÜİK, Internet Usage Rate Statistics)

The data related to “The Most Important Reason for Being Prestigious in Society” from the Life Satisfaction Survey conducted by TÜİK between 2009 and 2024 (TÜİK, 2025b) reveals both how societal perceptions of values have shifted over time and which values are prioritized. A decent family life and a moral lifestyle stand out as the most important reasons for being prestigious in society, chosen at much higher rates compared to other reasons (Graph 2). When examining the graph of reasons for being prestigious in society, it is seen that the most preferred reasons, decent family life and moral lifestyle, are on a downward trend over time. On the other hand, money, which ranks the third in importance, has shown a clear upward trend since 2020. Although there has been no change in the overall ranking of society, the downward trend in the first two values and the increasing importance given to money indicate that changes are taking place in society and that the value placed on materialism is increasing. Social media usage appears to be associated with individual value judgements and trends in societal shifts.



Graph 2. The Most Important Reason for Being Prestigious in Society
(Source: TÜİK, 2025, Life Satisfaction Survey 2009-2024)

When examining the graph showing the number of children involved in crime over the years, it is observed that juvenile crime generally increased in subsequent years, except for a decline during the pandemic in 2020 (Graph 3). Temporary declines in specific years may be attributed to contextual factors such as natural disasters including earthquakes. Additionally, the trend in juvenile crime closely parallels the increasing value placed on money.



Graph 3. The Number of Children in Conflict with The Law
(Source: TÜİK, 2014, 2015, 2025a, Statistics on children who come or are brought to the security unit based on the reason for their arrival-Geliş nedenine göre güvenlik birimine gelen veya getirilen çocuklar istatistikleri-)

Descriptive statistics for the variables included in the study are presented in Table 1. The table shows the mean, median, standard deviation, and Shapiro-Wilk test results for each variable. As seen, internet usage and divorce rates have higher variability compared to other variables. The normality test results suggest that while most variables approximate a normal distribution, some, such as the number of divorces, deviate from normality. These findings help guide the selection of appropriate statistical tests for subsequent analyses.

Table 1. Descriptive Statistics

	Number of Divorces	Internet Usage Rate	Decent Family	Money	Moral Lifestyle	The Number of Children in Conflict with the Law
Mean	142152	64.3	40.7	10.7	31.8	134885
Median	131372	64.0	40.2	10.2	30.8	133303
Standard deviation	24700	17.5	2.67	1.70	3.40	42056
Shapiro-Wilk W	0.856	0.925	0.943	0.921	0.888	0.967
Shapiro-Wilk p	0.017	0.204	0.382	0.177	0.052	0.790

Pearson correlation analysis was performed to determine the strength and direction of the relationship between the number of children involved in crime and the rate of internet use, the number of divorces, the year, the rate of importance given to

In addition, the correlation analysis revealed meaningful relationship between internet usage rates and other variables. The analysis shows that there is a high level of positive and significant correlation between the number of divorces, year, and

Table 2. Correlation Matrix

		The Number of Children in Conflict with the Law	Internet Usage Rate	Number of Divorces	Decent Family	Moral Lifestyle	Money
The Number of Children in Conflict with the Law	Pearson's r	—	0.858	0.858	-0.014	-0.722	0.630
	df	—	14	14	14	14	14
	p-value	—	< .001	< .001	0.958	0.002	0.009
Internet Usage Rate	Pearson's r		—	0.903			
	df		—	14			
	p-value		—	< .001			
Number of Divorces	Pearson's r			—			
	df			—			
	p-value			—			
Decent Family	Pearson's r		-0.282	-0.370	—		
	df		14	14	—		
	p-value		0.290	0.159	—		
Moral Lifestyle	Pearson's r		-0.631	-0.537	-0.474	—	-0.255
	df		14	14	14	—	14
	p-value		0.009	0.032	0.064	—	0.340
Money	Pearson's r		0.711	0.876	-0.656		—
	df		14	14	14		—
	p-value		0.002	< .001	0.006		—

a decent family, the rate of importance given to moral lifestyle, and the rate of importance given to money. The correlation matrix is shown in Table 2. The results reveal significant and very strong positive correlations between the number of children involved in crime and internet usage rate ($r = .858$, $p < .001$), divorce rate ($r = .858$, $p < .001$), and year ($r = .885$, $p < .001$) (Table 2). Additionally, among the reasons that contribute to being prestigious in society, a strong, significant, and negative relationship is observed with moral lifestyle ($r = -.722$, $p = .002$), while a strong, positive, and significant relationship is found with money ($r = .630$, $p = .009$). On the other hand, no significant relationship is found between the decent family variable and juvenile crime (Table 2).

monetary variables and internet usage rates, while there is a moderate level of negative and significant correlation between moral lifestyle and internet usage rates. Although the correlation between the importance placed on a decent family and internet usage is negative, it is not statistically significant (Table 2). In other words, higher internet usage rates are correlated with higher divorce rates and greater emphasis on money, and with lower emphasis on moral lifestyle.

Following the correlation matrix, several noteworthy patterns emerge among the variables. The very strong positive correlations between internet usage, divorce rates, and the value placed on money suggest a concurrent upward trend in these

factors over time. This indicates that as Türkiye becomes more digitally connected, certain social and family dynamics are also undergoing significant transformation. Moreover, the moderate to strong negative correlations between moral lifestyle and both internet usage and monetary values point to a potential erosion in traditional value systems. While causality can't be inferred, the inverse relationships imply that rising materialistic orientations and digital integration may be accompanied by a decline in moral and familial priorities within society.

Discussion and Conclusion

Since juvenile delinquency is a growing social problem worldwide, identifying the factors that cause delinquency contributes to finding effective solutions to this problem. Although the phenomenon of children being drawn into crime is not new, its recent rise across various countries can be seen as a manifestation of the negative effects of modernization and globalization. Recent studies have shown that the most influential factors contributing to children's involvement in crime include the rise in internet and social media use and the decline in parental supervision. At the same time, individuals' perspectives on life are changing due to the erosion and transformation of social values. This study reveals the impact of digitalization, social structure, and value perception on children's involvement in crime. National-level data indicate correlations between social conditions, digitalization, evolving cultural norms, and juvenile delinquency, though these associations do not imply direct causal effects on individual children. As this study uses aggregated data, the findings cannot be generalized to individual-level relationships between internet usage and juvenile delinquency. Any observed correlations reflect patterns at the national level and should be interpreted with caution to avoid ecological fallacy.

In this study, variables potentially influencing the number of children involved in crime were examined through descriptive and correlational analyses. This study identifies correlations between national-level indicators such as divorce rates and juvenile delinquency. However, due to the aggregate

nature of the data, these findings do not imply causal relationships at the individual level. Therefore, individual-level studies are needed to better understand how family structure influences children's involvement in crime. The dependent variable- number of juveniles drawn into crime- was analyzed in relation to digitalization indicators, family-related structural variables such as divorce rates, and perceived societal values. The results reveal statistically significant correlations among these variables.

The analyses show that increases in internet use, divorce rate, and the importance given to money, along with decreases in the importance given to moral lifestyle are associated with increases in juvenile delinquency. However, the importance attributed having a decent family doesn't show a statistically significant relationship with juvenile delinquency. This suggests that while family values remain culturally important, their direct impact on juvenile delinquency may be limited or mediated by other factors. Moreover, some of these variables are interrelated. Internet use correlates positively with divorce rate and materialistic values, while correlating negatively with the importance given to moral lifestyle. This indicates that digitalization not only influences individual behaviors but also reshapes social structures and value systems that effect juvenile delinquency. In this respect, internet usage appears to have a dual role, being both directly associated with juvenile delinquency and indirectly associated through its impact on family and social factors.

Although this study primarily focuses on internet usage rates due to the availability of long-term data, it is important to consider the latest findings on children's social media usage. According to TÜİK's Children's Use of Information Technologies Survey, 31.3% of children aged 6-15 were social media users in 2021, while this figure rose to 66.1% in 2024. This corresponds to an increase of approximately 111% in just three years. Such rapid growth indicates that the increase in internet penetration is closely related to the expansion of social media use. This is reshaping children's online activities and increasing their likelihood of exposure to crime risks.

The widespread use of the internet and social media is associated with patterns of victimization and delinquent behavior among children and adolescents. However, the impact is not limited to children. Internet and social media usage of parents weakens family communication, reduces supervision, and can even contribute to divorce-an additional risk factor for delinquency.

The results of the study are consistent with previous studies. Increased internet use is known to lead to higher levels of social media use and interaction in digital games. The content children are exposed to on social media (Cai, 2024; Mojares et al., 2015; Vishwakarma & Awasthi, 2025) and lack of parental supervision (Shali, 2017; Surong & Lyngdoh, 2020) increase exposure to social media and lead to delinquency. The intensive use of social media also increases the likelihood of criminal behavior in young people due to its contribution to attention deficits and emotional instability (Vishwakarma & Awasthi, 2025).

Additionally, the use of digital platforms negatively affects family dynamics. Studies have found that internet use damages family relationships (Mojares et al., 2015) and causes an increase in divorce rates. Social media use is contributing to a decrease in family communication (Güleç, 2018; Şentürk Dizman, 2019; Yener, 2021) and leading to infidelity (Stomer et al., 2024; Widiantari et al., 2019; Yüce & Yaman, 2022), and conflicts due to posts on social media that upset spouses (Güleç, 2018; Stomer et al., 2024), and thus divorce. Parents' internet and social media usage is associated with changes in family communication and supervision, and correlates with higher divorce rates, which in turn are linked to increased patterns of juvenile delinquency. Children from divorced families show a higher likelihood of involvement in crime-related behaviors, though causality cannot be inferred. This study, in line with other studies (Aazami et al., 2023; Javed et al., 2012; Price & Kunz, 2003), finds a significant positive correlation between divorce rates and the number of children drawn into crime.

The positive correlation between the increasing importance attributed to money and the number of children involved in crime can be understood in the context of social media fostering materialistic

behavior patterns. Materialism manifests itself in the belief that money and material possessions will lead to happiness (Ward & Wackman, 1971, pp. 559–560). Materialistic values are associated with adolescents' and children's tendency toward criminal behavior. A quantitative study examining deviance, in which the value system was the dependent variable and survey data from 500 children and adolescents in Italy were evaluated, revealed that materialistic and hedonistic values, including pleasure, money, and individual well-being, are associated with deviant behavior (Froggio & Lori, 2010). According to the results of a longitudinal study conducted with 2,648 middle school students in China, materialism and egocentrism are risk factors for adolescents' involvement in crime (Shek et al., 2020). A study that analyzed the content of 1,008 written texts by convicted children in the US revealed that materialistic values serve to drive them toward crime and legitimize it (VanderPyl, 2019). As material success becomes a criterion for social prestige, children may feel greater social pressure to achieve it, which may be related to increased delinquent behavior.

In conclusion, the analyses reveal significant correlations between juvenile delinquency and variables such as divorce rates, the perceived reasons for gaining social prestige, and the rise in internet usage rate. These relationships have become increasingly pronounced with the growing influence of digital media, particularly social media. A positive correlation was observed between internet usage rate, divorce rates, and the increasing importance attributed to money with the number of children involved in crime. On the other hand, a negative correlation was found between moral lifestyle and juvenile delinquency. However, the correlation between decent family and juvenile delinquency was not statistically significant.

In light of all findings, the study supports the routine activity theory perspective, which posits that crime occurs when motivated offenders, suitable targets, and absence of capable guardians coincide in time and space. Internet and social media use is associated with shifts in children's routines toward the digital environment, which correlates with reduced parental and societal supervision and greater exposure to potential risk situations.

Correlations between internet use, divorce rates, materialistic values, and juvenile delinquency indicate that changes in daily routines, family dynamics, and value systems are linked to patterns of crime risk, without implying direct causation.

At this point, it is also necessary to mention a methodological limitation of the study. The majority of the variables used show an upward or downward trend in the same direction during the period under review. These common trends may make some of the correlations between variables appear stronger than they actually are. For example, the increase in internet usage, the rise in divorce rates, and changes in social values may be parallel reflections of Türkiye's modernization and digitalization processes. Therefore, the results obtained should be evaluated within the framework of the simultaneity of these structural transformations rather than as direct causal relationships.

It is recommended that digital and social media literacy training be provided to families in order to reduce juvenile delinquency. It is important that these training programs should include content on the risks posed by new media and the measures that can be taken to counter these risks. In addition, it is necessary to expand efforts to prevent peer bullying in all National Education schools, starting from primary education, and to increase efforts to raise awareness among students on this issue. It is also recommended to develop programs that will prevent materialistic tendencies in values education courses and to implement awareness campaigns for families and children with the aim of raising the age of social media use among children. These practices will contribute to preventing children from being victimized as well as from being drawn into crime. Thus, today's victims can be prevented from turning into tomorrow's offenders. Further studies could expand upon these correlational findings by examining a broader range of socio-cultural and economic variables, thereby contributing to a deeper understanding of the factors associated with juvenile delinquency.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *This article does not involve any studies with human participants or animals conducted by the author. Therefore, ethical approval was not required.*

Informed Consent: *Not applicable.*

Data Availability: *All data analyzed in this study were obtained from the publicly available databases of the Turkish Statistical Institute (TÜİK).*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

Analyzing X Posts of Political Figures Regarding Syrians Under Temporary Protection: The Case of Ümit Özdağ

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Abstract

The aim of this study is to analyze how political figures in Türkiye use social media to shape public opinion regarding Syrians under temporary protection. In this context, the study focuses on Ümit Özdağ, a prominent political figure known for his nationalist discourses, and examines his posts related to Syrians on the social media platform X (formerly Twitter). The research covers the period after 2011, when the Arab Spring and the Syrian civil war triggered large migration waves, resulting in more than three and a half million Syrians living in Türkiye under temporary protection. A literature review was conducted to provide background information on the situation of Syrians in Türkiye and the policies implemented by the Republic of Türkiye, non-governmental organizations (NGOs), and international institutions. The study employs qualitative content analysis to examine Özdağ's social media posts, focusing on the language and themes used in his discourse. The findings indicate that Özdağ frequently associates economic and social problems in Türkiye with Syrians under temporary protection and uses discriminatory and marginalizing rhetoric. It is also observed that after the establishment of the Victory Party (Zafer Partisi), of which he is the founder and chairman, his discourse became sharper and more polarized, with a clear focus on mobilizing political support through the refugee issue. These results highlight the role of political figures in influencing public perceptions of migration and emphasize the potential consequences of hate speech in the social and political landscape of Türkiye.

Keywords: Syrians Under Temporary Protection, Hate Speech, Turkish Politics, Migration and Politics, Ümit Özdağ

Öz

Bu çalışmanın amacı, Türkiye'deki siyasi figürlerin geçici koruma altındaki Suriyelilerle ilgili kamuoyunu şekillendirmek için sosyal medyayı nasıl kullandıklarını analiz etmektir. Bu bağlamda, çalışma milliyetçi söylemleriyle tanınan önde gelen siyasi figür Ümit Özdağ'a odaklanmakta ve sosyal medya platformu X'te (eski adıyla Twitter) Suriyelilerle ilgili paylaşımlarını incelemektedir. Araştırma, Arap Baharı ve Suriye iç savaşının büyük göç dalgalarını tetiklediği ve üç buçuk milyondan fazla Suriyelinin Türkiye'de geçici koruma altında yaşamasına neden olduğu 2011 sonrası dönemi kapsamaktadır. Türkiye'deki Suriyelilerin durumu ve Türkiye Cumhuriyeti, sivil toplum kuruluşları (STK'lar) ve uluslararası kurumlar tarafından uygulanan politikalar hakkında arka plan bilgisi sağlamak için bir literatür taraması yapılmıştır. Çalışma, Özdağ'ın sosyal medya paylaşımlarını incelemek için nitel içerik analizi kullanmakta ve söyleminde kullandığı dil ve temalara odaklanmaktadır. Bulgular, Özdağ'ın Türkiye'deki ekonomik ve sosyal sorunları sık sık geçici koruma altında bulunan Suriyelilerle ilişkilendirdiğini ve ayrımcı ve marjinalleştirici bir retorik kullandığını göstermektedir. Ayrıca, kurucusu ve başkanı olduğu Zafer Partisi'nin kurulmasından sonra, söyleminin daha keskin ve kutuplaşmış hale geldiği ve mülteci meselesi aracılığıyla siyasi destek toplamaya açıkça odaklandığı gözlemlenmiştir. Bu sonuçlar, siyasi figürlerin göçle ilgili kamuoyunun algısını etkilemedeki rolünü ortaya koymakta ve Türkiye'nin sosyal ve siyasi ortamında nefret söyleminin olası sonuçlarını vurgulamaktadır.

Anahtar Kelimeler: Geçici Koruma Altındaki Suriyeliler, Nefret Söylemi, Türk Siyaseti, Göç ve Siyaset, Ümit Özdağ

Introduction

Migration has long been a central focus in the social sciences due to its transformative effects on societies, economies, and political systems. While migration can result from a range of factors such as economic hardship, environmental change, or social mobility, forced migration—particularly in the form of displacement caused by armed conflict—has gained increasing prominence in recent decades. One of the most striking examples of this phenomenon is the mass displacement triggered by the Syrian civil war (Özdağ, 2018, p. 16). Following the 2011 Arab Spring protests, Syria experienced a rapid descent into violent conflict as the regime responded harshly to demands for democracy and reform. Trapped between government forces and various armed factions such as ISIS and the Free Syrian Army, millions of Syrians were forced to abandon their homes in search of security.

In response, political narratives surrounding migration have become increasingly salient, with political leaders and parties framing refugee-related issues through ideological and strategic lenses—particularly in media and digital platforms. Atıcı (2022) evaluated political leaders' discourses on migration through internet news articles using Teun Van Dijk's critical discourse analysis model. The study found that these discourses shaped macro-level headlines and leads, while being constructed through micro-structural elements. It concluded that Turkey is portrayed as bearing a heavy migration burden and receiving insufficient support from European countries, while migrants are often represented as a threat. The tone of these narratives differed based on whether the political actors were in power or in opposition. Similarly, Mazlum (2024) analyzed anti-immigrant rhetoric during the 2023 general elections, particularly focusing on the Victory Party and its leader Ümit Özdağ. The study found that the party framed migration as a national crisis, opposing globalization and imperialist interventions in the Middle East, and positioned itself as a populist movement centered on refugee opposition.

Deniz and Kargın (2023) examined the Victory Party's Twitter discourse, noting that although direct targeting of Syrians was limited, refugees were

indirectly framed as excluded and voiceless. The party's messaging portrayed Syrians as economic and security threats. Likewise, Bayram (2020) studied the social media discourse of politically engaged youth using the concepts of "crystallization" and social representations. Findings showed that youth participants internalized a crisis-based narrative around refugees, despite limited understanding of the phenomenon itself.

In recent years, the issue of Syrians under temporary protection has become central in the agendas of nationalist political parties. Public attitudes have increasingly shifted toward negativity, shaped in part by political discourse. Against this backdrop, this study analyzes the refugee-related social media posts of Ümit Özdağ—one of the most prominent nationalist figures in Turkish politics. The research builds its framework by first exploring the concept of migration, the origins of the Syrian conflict, and Turkey's legal and political position regarding temporary protection. Through a focused discourse analysis, it examines Özdağ's rhetoric and political messaging as reflected in his social media content.

Conceptual Framework

The Concept of Refugee

Migration has increasingly become a pressing global issue, particularly due to political conflicts and instability in various regions. Individuals who flee their home countries in search of safety are often classified as "asylum seekers" or "refugees." Although these terms are sometimes used interchangeably, they have distinct legal meanings. According to Pazarıcı (1990), "asylum" refers to the act of seeking protection from persecution or prosecution by taking refuge in the premises of a foreign state. In contrast, a "refugee" is defined by the 1951 Geneva Convention and its 1967 Protocol as someone with a well-founded fear of persecution based on race, religion, nationality, political opinion, or membership in a particular social group, and who is therefore unable or unwilling to return to their country of origin (Directorate General of Migration Management, 2015; UNHCR, 2024). The United

Nations High Commissioner for Refugees (UNHCR), established in 1950, provides broader protection to individuals regardless of whether the host country is a party to the Convention or Protocol. Initially, the Convention limited the definition of refugees to events occurring in Europe before 1951; however, these temporal and geographical restrictions were removed by a 1976 revision (Özdal, 2018, p.16).

It is also important to differentiate between “refugees” and “migrants.” While migrants typically move within or between countries voluntarily—often for economic reasons—and may not require international protection, refugees are forcibly displaced and in need of legal and humanitarian safeguards (Özdal, 2018, p. 18). In recent years, especially due to war and terrorism in the Middle East, forced migration has reached unprecedented levels. One of the most prominent examples is the mass displacement of Syrians following the civil war, with Turkey becoming a key host country due to its geographic location and relatively favorable conditions. As refugee status is internationally recognized, developments concerning Syrian refugees are closely monitored by the global community.

Emergence of the Syrian Refugee Crisis

The wave of political mobilization known as the Arab Spring began in Tunisia in 2010, following Mohamed Bouazizi’s self-immolation in protest against socioeconomic grievances and state repression (Douglas et al., 2014, p. 3). This act ignited widespread demonstrations that quickly spread throughout the Arab world including Yemen, Bahrain, Libya, and Syria—resulting in considerable political upheaval and instability across the region (Lynch, Harding, & Andres, 2013, p. 1–2).

Among the affected countries, Syria experienced the most severe and protracted crisis, which rapidly escalated into a devastating civil war. The conflict produced one of the most significant refugee movements of the 21st century, displacing millions and giving rise to a major regional migration crisis (UNHCR, 2025).

These developments not only transformed the demographic landscape of the region but also generated substantial security concerns. Notably, Turkey’s early adoption of an open-door policy positioned it as the primary host country for Syrians under temporary protection.

Table 1. Number of Syrians Under Temporary Protection by Country

Country	Source of Data	Date of Data	Population
Turkey	Ministry of Interior Directorate General of Migration Management	April 21, 2021	2,829,266
Lebanon	UNHCR	March 31, 2021	755,426
Jordan	UNHCR	March 31, 2021	564,079
Iraq	UNHCR	March 31, 2021	304,409
Egypt	UNHCR	February 28, 2021	142,122
North African Countries	UNHCR	January 31, 2020	43,283

Source: Ministry of Interior Directorate General of Migration Management, 2025; UNHCR, 2025

The next section will examine the specific legal frameworks and contextual factors that facilitated the arrival and accommodation of Syrians in Turkey.

The Arrival of Syrians Under Temporary Protection to Turkey

Syria, which gained independence in 1946, came under the rule of the Arab Socialist Ba'ath Party after a coup in 1963, and later under Hafez al-Assad in 1970. After his death in 2000, his son Bashar al-Assad succeeded him and has served as the President of Syria since then. Syria, which had turned into a realm of power for the Assad family, experienced major conflicts after the Arab Spring, and the civil war is still ongoing.

Due to its geographical location and the living conditions it offers, the Republic of Turkey has become the most preferred country for Syrians under temporary protection. In particular, the Regulation on Temporary Protection, which came into force in 2014, is considered a significant milestone in Tur-

key's migration management for all refugees, including those coming from Syria. According to the United Nations High Commissioner for Refugees (UNHCR, 2025), the Turkish government describes this regulation on its website FAQ section as follows:

Table 2. Who Are the Syrians? (UNHCR, 2021)

Year	Dangerous People Who Will Cause Problems in the Future (%)	People Who Are a Burden to Us (%)	People Who Cannot Protect Their Country (%)	People Fleeing Oppression/War (%)
2017	39.0	43.0	39.5	57.8
2019	42.0	41.4	35.0	39.5
2020	24.7	33.4	22.9	38.2
2021	40.7	38.1	33.6	37.5

"Under the Regulation on Temporary Protection, published in the Official Gazette dated 22/10/2014 and numbered 29153, individuals who have come or crossed into Turkey en masse or individually from the Syrian Arab Republic due to events occurring since 28/04/2011 — including Syrian citizens, stateless persons, and refugees — have been placed under temporary protection, even if they have applied for international protection."

Table 4. Turkish Citizens' Views on Syrians Sharing Living Spaces

Year	They Should Be Sent Back (Total) (%)	They Should Be Sent Back to Safe Zones (%)	They Should Be Sent Back Under Any Circumstance (%)	They Should Live Only in Camps (%)	Special Should Be Built for Them in Turkey (%)	Cities Should Be Built in Turkey (%)	They Should Live Wherever They Want (%)	They Should Be Evenly Distributed Across Turkey (%)
2017	48.9	37.4	11.5	7.7	7.9		4.8	2.8
2019	69.8	44.8	25.0	5.5	5.3		2.4	1.0
2020	80.5	40.0	38.0	3.1	6.1		6.8	1.0
2021	82.0	32.3	49.7	1.0	7.5		4.8	1.0

The efforts of the Republic of Turkey regarding Syrians under temporary protection have been criticized in the report "Struggling to Survive: Refugees from Syria in Turkey" published by Amnesty International. These criticisms concern Turkey's geographical anxieties and the precautions it has taken against Syrians under temporary protection (Amnesty International, 2014).

With a population nearing 4 million, Syrian migrants have also begun to raise concerns among the Turkish population. Political factions in Turkey seem to capitalize on these concerns. The UNHCR prepared a comprehensive report in 2021 on the Syrian issue, which affects Turkey's demographic

structure. Based on interviews with Syrian migrants and members of Turkish society, the report examined the public's perception of Syrian integration from 2011 to 2021:

In the 10-year period between 2011 and 2021, the UNHCR examined the large migration wave from Syria to Turkey by conducting interviews with both Syrian migrants and Turkish citizens. Based on these interviews, the UNHCR's report titled "*Total Persons of Concern by Country of Asylum, 2021*" presents the responses of Turkish citizens to the question of whether Syrians have been able to integrate into Turkish society:

Table 3. According to Turkish Society, How Well Have Syrians Integrated? (UNHCR, 2021)

Year	Fully Largely Adapted (%)	& Did Not Adapt & Very Little (%)	Neither Adapted Nor Did Not Adapt (%)
2019	13.2	64.4	19.9
2020	11.0	69.9	16.4
2021	10.5	74.1	13.5

One of the key questions in the report titled "Syrian Barometer" was directed at Turkish citizens: "Is it possible to live together with Syrians?"

An analysis of the report's findings shows that, over the years, the Turkish public has become increasingly reluctant about the continued presence of Syrians in Turkey. The survey results are presented as follows:

Over time, it becomes evident that Turkish citizens' attitudes toward Syrians have become more negative. The report also indicates that the same applies to Syrians themselves. As years have passed, more Syrians have expressed a desire to leave Turkey. This trend is supported by survey results presented in the report:

Table 5. Do Syrians Living in Turkey Want to Return? (UNHCR, 2021)

Year	I Absolutely Do Not Consider Returning to Syria (%)	I Would Return If the War Ends and a Government We Want Is Established (%)	I Would Return If a Safe Zone Is Established in Syria (%)
2017	16.7	59.6	5.9
2019	51.8	30.3	5.9
2020	77.8	16.0	2.3
2021	60.8	33.1	1.7

The Syrian Refugee Crisis and Activities of International Organizations

Syrians under temporary and international protection are entitled to a wide range of rights, including protection from deportation or refoulement, access to social assistance, freedom of thought, the right to establish associations, and safeguards against arbitrary detention. Due to its cultural characteristics and geographical proximity, Turkey began providing protection to Syrians early in the conflict, particularly following the enactment of the Law on Foreigners and International Protection in 2014. The development of relevant legislation was influenced both by Turkey's lack of prior experience with large-scale migration and by the requirements of its EU accession process (Tamer, 2020, p. 12).

The large influx of Syrians into Turkey quickly gained an international dimension. According to Dönmez (2015, p. 343), the Syrian migration crisis has prompted increased international cooperation and shaped Turkey's migration policies through alignment with EU law, institutional reforms, and global agreements. As a result, Turkey has become a key host country not only for Syrians but also for migrants of other nationalities.

Since 2011, Turkey has implemented various initiatives to address the needs of Syrians under temporary protection and promote their integration. Erdoğan (2018), in his study *Syrians in Turkey*, emphasized that both the Turkish public and the state have taken significant steps in this regard. These efforts have focused on areas such as shelter, nutrition, healthcare, and education. The UNHCR's Syrian Barometer Report (2021) presents comprehensive data on the status of Syrian migrants in Turkey.

Table 6. Evaluation of Services Provided by the Republic of Turkey to Syrians under Temporary Protection by the Beneficiaries Themselves

Support Type	Completely Insufficient + Insufficient (%)	Very Sufficient + Sufficient (%)	Neither Sufficient nor Insufficient (%)
Health Support	17.3	64.0	16.2
Legal Support / Protection Support	27.4	53.3	12.5
Educational Support	27.8	37.2	19.8
Food Aid	71.6	10.8	12.7
Shelter Support	73.2	10.0	11.5
Financial Aid	72.5	9.2	13.7

Effective migration governance and improved living conditions for refugees require collaboration among public institutions, civil society organizations, and international actors. Among the most significant support mechanisms is the Regional Refugee and Resilience Plan (3RP), which addresses the needs of Syrian refugees in Turkey, Lebanon, Egypt, and Jordan. The 3RP is implemented in Turkey by UNHCR and UNDP, with an emphasis on protection services, education, healthcare, and social inclusion (3RP Turkey Chapter, 2022, p. 4). It is aligned with the United Nations' 2030 Sustainable Development Goals, which prioritize dignity, equality, and access to essential resources for all, regardless of identity (United Nations, 2015, p. 1; Peynirci, 2020, p. 13).

Ümit Özdağ and the Refugee Crisis

Ümit Özdağ is a prominent figure in Turkish politics and the founder and leader of the Victory Party (Zafer Partisi), which was established on August 26, 2021. The party has drawn attention primarily through its strong stance on migration and refugee policies. Its charter emphasizes key principles such as preserving Turkey's unitary structure, rule of law, equality, and human rights (Victory Party Charter, 2021).

Özdağ has become well-known for his statements regarding Syrians under temporary protection. In his speeches, he often highlights the economic challenges faced by Turkish citizens and frames Syrians as contributing to these difficulties.

According to Özdağ, the resources allocated to Syrians negatively affect the rights and welfare of Turkish citizens. He specifically criticizes policies that provide Syrians with benefits related to employment, education, and healthcare, arguing that these resources should instead be directed toward Turkish citizens.

A key element of Özdağ's political discourse is his firm opposition to granting citizenship to Syrians. He views this step as a threat to Turkey's demographic balance and national security, insisting that Syrians should return to their home country. Özdağ calls for decisive state action to facilitate this return, framing it as essential for protecting Turkey's sovereignty and social stability.

In addition, Özdağ has criticized international organizations, particularly the European Union (EU) and the United Nations (UN), for failing to provide Turkey with sufficient financial and logistical support in addressing the refugee crisis. This perspective aligns with claims made by several academics and politicians who argue that the international community has fallen short in burden-sharing, especially in economic terms (Güzel, 2017, p.113; Erdoğan, 2018).

Anti-Immigrant Sentiment: Comparison of EU Countries and the Victory Party

Anti-immigrant sentiment in Europe rose sharply after the 2015 European Refugee Crisis. During this period, right-wing populist parties framed migrants and refugees as a "threat," focusing on two main arguments: economic burden and cultural identity loss (Mudde, 2004). Populist rhetoric typically sets up a conflict between the "pure people" and the "corrupt elite," but in recent years it has increasingly targeted vulnerable groups such as migrants (Wodak, 2015). This narrative gains strength during times of economic stagnation and high unemployment.

Many right-wing parties promote the idea of "welfare chauvinism," arguing that social benefits should be reserved for native citizens, excluding migrants (Keskinen, 2016). For instance, Germany's AfD focuses on anti-immigrant policies, France's RN portrays migrants as a threat to national values (Betz, 2019), and Hungary's Viktor

Orbán has tightened border controls while labeling refugees as a danger to national survival (Pirro & Taggart, 2018). Social media amplifies these messages, spreading digital hate speech and deepening societal polarization (Citron & Norton, 2011).

In Turkey, anti-immigrant discourse has followed a similar trajectory since the start of the Syrian civil war in 2011. As of 2025, 2.82 million Syrians live in Turkey under temporary protection (DGMM, 2025). This demographic shift has fueled political debates, especially around economic and social pressures (Erdoğan, 2018).

The Victory Party (Zafer Partisi), founded in 2021, has centered its political agenda on sending refugees back to Syria, echoing European right-wing populist strategies (Yaşlı, 2023). Party leader Ümit Özdağ often highlights demographic concerns, citing areas like Kilis and Hatay where Syrian populations outnumber or approach the local population (Turkish Grand National Assembly, 2019).

While European right-wing parties focus on restricting immigration and protecting national sovereignty, the Victory Party emphasizes "return" and "protecting national identity." Both, however, frame migrants as the cause of economic problems. Özdağ frequently claims that Syrians are taking jobs from Turkey's 7 million unemployed citizens, mirroring European welfare chauvinism narratives (Betz, 2019; Mudde, 2004).

Populism, Digital Hate Speech and Anti-Refugeeism

In contemporary politics, populism has emerged as a dominant discourse, especially in contexts marked by economic insecurity and migration-related tensions. Populist rhetoric often constructs a binary opposition between the "pure people" and the "corrupt elite," but increasingly targets vulnerable out-groups such as refugees (Mudde, 2004, p. 543). In Turkey, this dynamic is evident in the portrayal of Syrian refugees as scapegoats for broader societal grievances.

Parallel to this, digital hate speech has become a powerful tool for disseminating anti-refugee narratives. Social media platforms amplify discriminatory discourse by enabling rapid and wide-

reaching circulation of content that dehumanizes migrants. Such rhetoric reinforces exclusionary nationalism and legitimizes policies aimed at restricting refugee rights (Citron & Norton, 2011, p. 1437).

The convergence of populist discourse and digital hate speech has significantly contributed to the rise of refugee opposition in Turkey. This opposition often manifests through the politicization of refugee presence, framing them as both economic and cultural threats. In this study, the case of Ümit Özdağ is examined as a central figure who strategically employs nationalist and populist rhetoric in digital spaces to construct a narrative of refugee hostility.

Method and Findings

This study is based on a critical discourse analysis (CDA) of the most highly engaged posts shared by Ümit Özdağ on X (formerly Twitter) between the years 2021 and 2025, focusing on the refugee crisis in Turkey. The research universe consists solely of X, while the sample includes eight posts containing content related to refugees that received significant public attention. Posts were selected using engagement metrics such as the number of likes, reposts, and comments to ensure that the most influential and widely circulated content was analyzed.

The study follows a qualitative research design, adopting the critical discourse analysis framework developed by Wood and Kroger (2000), which emphasizes the role of discourse in constructing social meaning and shaping public perception. This approach was chosen because it allows for the examination of how political actors use language and visuals to influence societal attitudes toward marginalized groups, particularly refugees.

Data Collection and Preparation

The analysis began with the systematic collection of all refugee-related posts shared by Ümit Özdağ within the specified timeframe. Each post was archived as a screenshot to preserve both its textual content and visual elements. This ensured that the study could capture the multimodal nature of political communication on X.

Analytical Procedure

The analytical process was conducted in four stages:

1. Initial Screening and Selection Posts were first screened to identify those directly addressing the refugee issue. Only posts explicitly related to Syrians under temporary protection or migration policies were included.
2. Coding and Thematic Categorization The textual and visual content of each post was coded using key thematic categories. These included:
 - Construction of Social Identity – narratives defining the boundaries of the “nation” and “citizenship,”
 - Othering – discourses portraying refugees as outsiders or threats,
 - National Belonging – rhetoric emphasizing unity and exclusion based on national identity.
3. Multimodal Analysis Both the language and imagery of the posts were examined to understand how symbols, metaphors, and visual cues reinforced nationalist or exclusionary narratives. This stage focused on identifying rhetorical strategies such as fear appeals, symbolic framing, and calls for collective action.
4. Synthesis of Findings Finally, the identified patterns were synthesized to reveal how political discourse on X contributes to shaping public opinion and fostering societal polarization.

Theoretical Foundation

Discourse analysis, as applied in this study, draws upon speech-act theory, which highlights the social function of language, and ethnomethodology, which examines how individuals construct meaning through everyday linguistic practices. Within this framework, discourse analysis is understood as a method that evaluates the variability and diversity of meaning in social interactions (Elliott, 1996).

Positioning in the Literature

This methodological approach is consistent with previous research analyzing political discourse and migration-related narratives on digital platforms. For example, Mendelsohn, Budak, and Jurgens (2021) conducted framing analysis of immigration-related tweets, demonstrating how different types of frames affect audience engagement. Similarly, Sutkutė (2019) explored how refugee-related narratives were shaped through Facebook posts using a mixed-method approach that integrated qualitative and quantitative data. KhosraviNik (2014) provided a foundational CDA study of immigration discourses in the British press, focusing on processes of othering and media representation. More recently, Gür-Şeker (2023) examined how refugees and migrants are represented in Turkish online media discourse, emphasizing the value of multimodal analysis. By aligning with these established studies, the present research gains theoretical grounding and methodological credibility, offering a nuanced examination of how a prominent political figure uses digital platforms to construct and disseminate narratives about refugees.

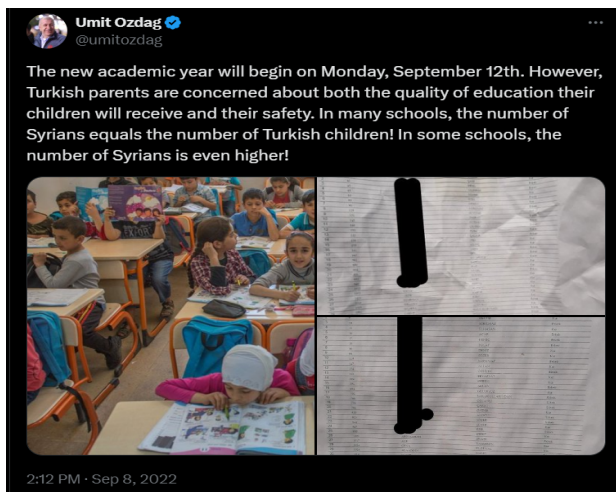


Figure 1. Ümit Özdağ's Post Regarding the High Number of Refugee Children Within the Context of the Refugee Crisis (<https://twitter.com/umitozdog/status/156783335777510401>)

In the post shown above, Ümit Özdağ criticizes the educational services provided to the children under temporary protection and establishes a hierarchical distinction between Syrian and Turkish students. Through this statement, Özdağ not only keeps the refugee crisis in the public discourse but

also uses his rhetoric to criticize the ruling government. Moreover, he politicizes the right to education for those under temporary protection, framing it as a point of contention within broader political debates.

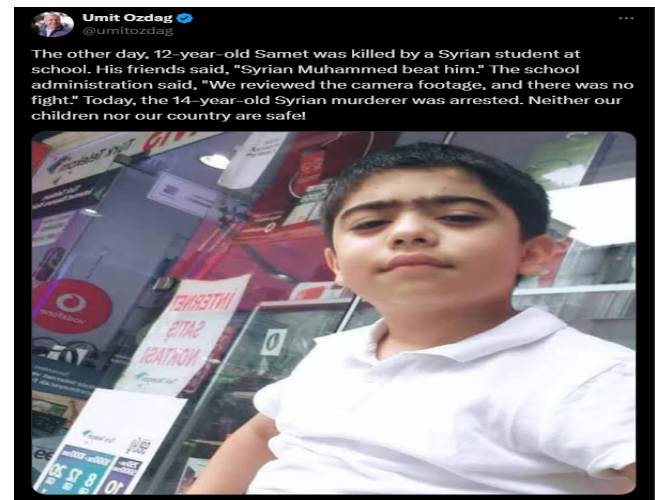


Figure 2. Ümit Özdağ's Post Concerning a Criminal Incident (<https://twitter.com/umitozdog/status/1573309696437637120>)

In this post, Özdağ shares a criminal incident involving elementary school-aged children without referencing any official document or authority. By doing so, he contributes to social division among the Turkish public and targets the entire Syrian population. Through this rhetoric, Özdağ generalizes the actions of a few individuals to an entire group, thus reinforcing negative stereotypes against those under temporary protection.

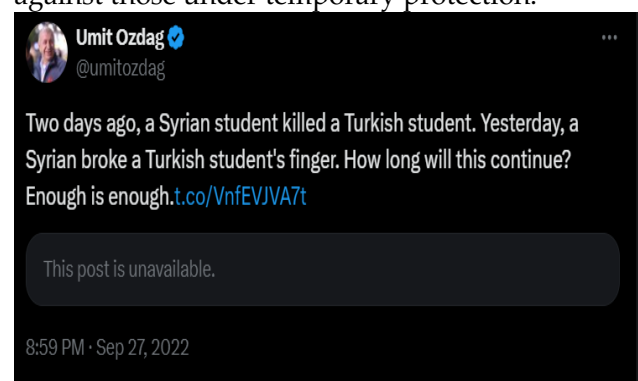


Figure 3. Ümit Özdağ's Divisive Post Regarding the Turkish Nation and Syrians (<https://twitter.com/umitozdog/status/1574821028026613762?lang=tr>)

In this post, Ümit Özdağ criticizes the policies of the Republic of Turkey concerning individuals under temporary protection. His language emphasizes a distinction between the Turkish nation and

Syrians, contributing to a polarizing and exclusionary narrative within the public discourse.



Figure 4. Ümit Özdağ's Video Post on the Temporary Protection Crisis Involving Syrians (<https://twitter.com/umitozdog/status/1570294418195759104>)

In this post, Özdağ criticizes the support provided to Syrian jewelers, claiming that Turkish citizens are being treated as second-class in their own country. Through this message, he argues that greater assistance should be directed toward Turkish nationals and reveals an expectation of preferential treatment for them within the Republic of Turkey.

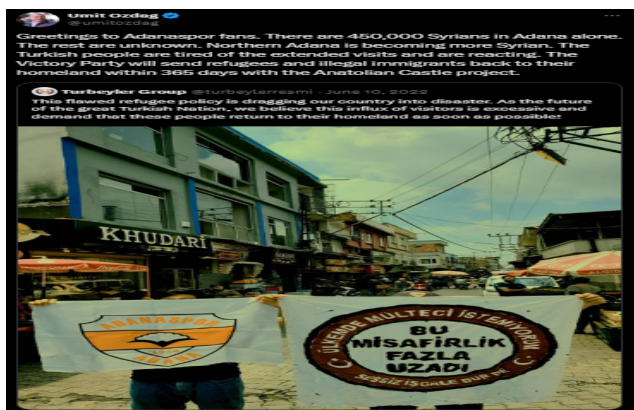


Figure 5. Ümit Özdağ's Post Sharing Content from a Supporters' Group on X (<https://twitter.com/umitozdog/status/1535327082791809024>)

In this post, Ümit Özdağ shares a visual originally published by a supporter group, using it to reinforce his anti-refugee discourse. The image and content aim to generate nationalistic sentiment by emphasizing a collective stance against the pres-

ence of Syrian refugees. By amplifying such messages, Özdağ integrates public and grassroots expressions into his political rhetoric on migration and national identity.

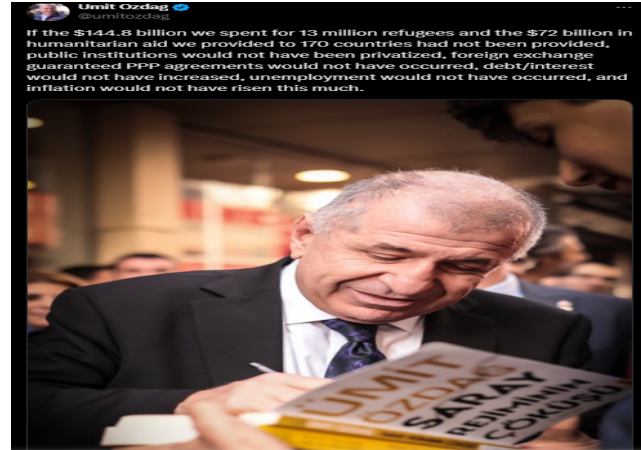


Figure 6. Ümit Özdağ's Post Criticizing Turkey's Aid to Syrians Under Temporary Protection (<https://x.com/umitozdog/status/1597985191964086273?s=46>)

In this post, Ümit Özdağ openly criticizes the Turkish government's assistance programs directed at Syrians under temporary protection. By highlighting what he perceives as the disproportionate allocation of state resources, Özdağ emphasizes the idea that Turkish citizens are being economically disadvantaged. This post reflects his recurring discourse that portrays Syrian refugees as a burden on the national economy and as recipients of unjustified privileges, reinforcing a hierarchical distinction between citizens and refugees.



Figure 7. Ümit Özdağ's Divisive Post Targeting the Turkish Nation and Syrians Under Temporary Protection (<https://x.com/umitozdog/status/152283156101-1388417?s=46>)

In this post, Ümit Özdağ draws a clear line between the Turkish nation and Syrians under temporary protection, using language that promotes societal division. His rhetoric frames the refugee population as fundamentally incompatible with Turkish national identity and interests. By amplifying nationalist sentiments, Özdağ appeals to fears regarding demographic change and cultural displacement, reinforcing exclusionary and oppositional narratives toward Syrians in Turkey.

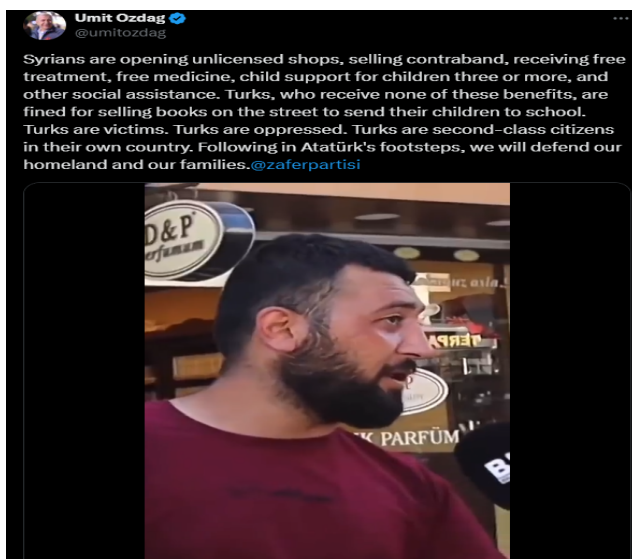


Figure 8. Ümit Özdağ's Video Post Containing Divisive Rhetoric Regarding the Crisis of Syrians Under Temporary Protection (<https://x.com/umitozdog/status/1702691301605441884?s=46>)

In this video post, Ümit Özdağ once again uses divisive language to construct a binary opposition between the Turkish population and Syrians under temporary protection. By portraying Syrians as a threat to public order and national unity, Özdağ reinforces populist and nationalist discourse. The post instrumentalizes refugee-related issues for political gain, using emotionally charged visuals and rhetoric to deepen societal polarization and fuel anti-refugee sentiment.

Global Perspective

While this study primarily focuses on Ümit Özdağ and the Victory Party's discourse on refugees in Turkey, it is important to situate these findings within a broader global context. Across the world, far-right and populist political movements have

increasingly framed migration as a challenge to national identity, cultural homogeneity, and security. Similar to Özdağ's rhetoric, these movements construct narratives that portray migrants as a burden on public resources and a threat to social cohesion. In Europe, leaders such as Marine Le Pen in France and Matteo Salvini in Italy, as well as parties like Alternative für Deutschland (AfD) in Germany, have utilized social media platforms to amplify anti-immigration messages and mobilize public sentiment. Likewise, in the United States, Donald Trump's "Build the Wall" campaign exemplifies how digital platforms are leveraged to promote exclusionary and polarizing narratives (Wodak, 2015; Mudde, 2019).

By comparing Özdağ's discourse with these international examples, this section highlights both the shared global strategies of contemporary right-wing populism and the unique features of the Turkish context. This comparison allows for a deeper understanding of how political rhetoric around migration and refugees operates across different cultural and political landscapes.



Figure 9. Figure 1. Marine Le Pen's Tweet Opposing Mass Immigration (2017) (https://x.com/mlp_officiel/status/854056552763990016)

Marine Le Pen's post frames mass immigration as an "oppression" and a "tragedy," portraying migrants as a source of threat. This discourse reinforces the idea of protecting national identity and

aims to unite the French public around a collective sense of “us.”



Figure 10. Donald Trump’s “Build the Wall” Tweet Emphasizing Border Security (2017) (<https://x.com/realdonaldtrump/status/878013639613186049>)

Donald Trump’s tweet frames Mexico as a dangerous external threat, directly linking the issue to drug trade and violence. By invoking the slogan “BUILD THE WALL,” Trump offers a symbolic and physical solution that reinforces the idea of protecting the nation through strict border control.

This rhetoric mirrors strategies used by other right-wing populist leaders, such as Marine Le Pen and Ümit Özdağ, who similarly portray migration as a danger to national security and social order, albeit in different political and cultural contexts.

Marine Le Pen, Donald Trump, and Ümit Özdağ each employ similar rhetorical strategies to frame migration as a pressing national issue. Le Pen emphasizes mass immigration as a “tragedy,” focusing on cultural homogeneity and national identity. Trump frames immigration as an external threat, symbolically and physically addressed through his “Build the Wall” slogan, emphasizing border security and sovereignty. Özdağ’s discourse parallels these narratives by portraying Syrian refugees as both an economic and social burden, positioning their presence as a threat to Turkey’s stability. While the cultural and political contexts differ, all three leaders utilize othering to mobilize public sentiment, reinforce in-group identity, and advance nationalist political agendas.

Conclusion

Migration has been a recurring phenomenon throughout human history, often driven by war, economic hardship, and other crises. The Syrian

civil war, which began in 2011, created one of the largest refugee movements in recent decades. Due to its geographical proximity and open-door policy, Turkey became a primary destination for Syrians seeking safety. As of today, Turkey continues to host a significant population under temporary protection, which has generated complex social, economic, and political challenges.

This study analyzed a selection of highly engaged posts shared by Ümit Özdağ on X (formerly Twitter), focusing on his discourse regarding Syrians under temporary protection. Through critical discourse analysis, it was observed that Özdağ frequently employs language that frames Syrians as a threat to national unity and public order. In several posts, he constructs a binary opposition between the Turkish population and Syrians, often emphasizing themes of national identity, security concerns, and demographic change. Some posts included visual materials originally created by supporter groups, which were integrated into his messaging to strengthen nationalist narratives and amplify public opposition to refugees.

The findings indicate that such digital discourse can play a role in shaping public perceptions and fostering societal polarization. Politicians, as influential public figures, have the capacity to amplify fears and concerns through their online activity. In the case of Özdağ, his posts contribute to exclusionary narratives that may influence attitudes toward refugees and the broader migration debate in Turkey.

By combining perspectives from political communication, migration studies, and digital discourse analysis, this research provides a comprehensive view of how political rhetoric surrounding refugees is constructed and disseminated through digital platforms. The study highlights the importance of critically examining how online narratives are used to mobilize public opinion, revealing the potential of digital discourse to both reflect and intensify socio-political tensions.

Declarations

Funding: No funding was received for conducting this study.

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *This article does not involve any studies with human participants or animals conducted by the author. Therefore, ethical approval was not required.*

Informed Consent: Not applicable.

Data Availability: *All data analyzed in this study were obtained from publicly accessible posts on the social media platform X (formerly Twitter).*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

Incursion of Artificial Intelligence into News Production: Will AI Revive Journalism?*

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Abstract

This study examines the integration of artificial intelligence (AI) into news production processes and analyzes its implications for journalism within independent digital news media in Türkiye. The research is based on semi-structured in-depth interviews with 29 participants, including 24 journalists and 5 experts. From a political economy perspective, the findings reveal that precarity and loss of professional control are the most significant concerns among journalists. Nevertheless, participants perceive AI technologies not only as a threat but also as an opportunity to liberate journalism from its profit-oriented structure. In particular, automation of routine news, visual content, and voiceovers is considered a way to enable journalists to focus on more qualitative, long-form, and investigative reporting. However, the study shows that the controlling power of AI in news distribution and content filtering is largely overlooked, which constitutes a blind spot in Türkiye's media ecosystem. Limited financial and technical resources further restrict AI integration to basic functions. The study concludes that unless economic and ethical issues are addressed, AI will inevitably be instrumentalized for the needs of the capitalist market. Ensuring human oversight, adherence to ethical principles, and structural policies that support independent media organizations emerge as crucial conditions for safeguarding the future of journalism.

Keywords: Journalism, Artificial Intelligence, Digital Media, News Production, Automation

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Öz

Bu çalışma, yapay zekânın (YZ) haber üretim süreçlerine entegrasyonunu inceleyerek, Türkiye'deki bağımsız dijital haber medyasında gazetecilik mesleğine yansımalarını analiz etmektedir. Araştırma, 24 gazeteci ve 5 uzmandan oluşan toplam 29 katılımcıyla yapılan yarı yapılandırılmış derinlemesine görüşmelere dayanmaktadır. Ekonomi politik perspektifle yürütülen analizlerde, gazetecilerin en önemli kaygılarının güvencesizlik ve mesleki kontrol kaybı olduğu ortaya çıkmıştır. Bununla birlikte, görüşmeler YZ teknolojilerini yalnızca tehdit değil, aynı zamanda gazeteciliği ticarileşmiş yapıya dönüştürecek bir fırsat olarak da değerlendirmektedir. Özellikle rutin haberlerin, görsel içeriklerin ve seslendirmelerin otomasyonu sayesinde gazetecilerin daha nitelikli, uzun soluklu ve araştırmacı haberlere yönelebileceği vurgulanmaktadır. Ancak bulgular, YZ'nin haber dağıtım ve içerik filtreleme süreçlerindeki kontrol gücünün büyük ölçüde göz ardı edildiğini ve bunun Türkiye'deki haber ekosisteminin kör noktası olduğunu göstermektedir. Katılımcıların sınırlı finansal ve teknik kaynaklara sahip olması, YZ entegrasyonunu daha çok temel işlevlerle sınırlı kılmaktadır. Sonuç olarak araştırma, ekonomik ve etik sorunlar çözülmedikçe YZ'nin sermaye odaklı piyasa yapısının çıkarlarına hizmet etmesinin kaçınılmaz olacağını ortaya koymaktadır. Gazetecilik mesleğinin geleceği için insan denetimi, etik ilkelere bağlılık ve bağımsız medya kuruluşlarını destekleyecek yapısal politikaların hayati öneme sahip olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Gazetecilik, Yapay Zeka, Dijital Medya, Haber Üretimi, Otomasyon

* This article is based on author's PhD dissertation thesis titled The Critical Political Economy of the Internet in Türkiye: The Relations of Production in the Independent Digital News Media completed at Bahçeşehir University in 2025.

Introduction

Rapid developments in artificial intelligence (AI) not only transformed the internet of things, but also challenged the landscape of journalism. Automation of journalistic practices from news production to distribution offers opportunities such as cost reduction and time efficiency. However, the capitalist socio-economic system embedded in AI technologies creates a structure in which the new media sphere becomes a reproduction environment of existing power relations. In this respect, concepts of surveillance capitalism (Zuboff, 2019) and data colonialism (Couldry & Mejias, 2019) provide a better understanding about the motives behind the infrastructure of AI. Zuboff's (2019) analysis of surveillance capitalism points out that data extraction and algorithmic optimization serve corporate accumulation rather than public needs. From a similar perspective, Couldry and Mejias (2019) discuss that data-driven information infrastructure establish a form of data colonialism, which harbors the political and economic interests of dominant actors into technological structures. Thus, AI in journalism should be perceived as an extension of capital and ideology that reproduces asymmetries of power. In that sense, described as "[t]he term ... frequently applied to ... developing systems endowed with the intellectual processes, characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience", AI came into our lives more as a disruptive innovation rather than a revolution (Copeland, 2024). Therefore, the choice of OECD countries to refer to AI as AI system underlines its social, political and economic implications. Within this context, AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content recommendations, or decisions that influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment. (Grobelsnik, et al., 2024)

This elaborate definition also highlights how AI technologies are susceptible to instrumentalization by profit-driven private corporations and governments that aim to control information flow. As Dia-

kopoulos (2023) argues, AI systems are able to aggravate the commodification of journalism through automating content production and distribution while intensifying control on information and undermining editorial independence. Highlighting the paradigm shift in journalism initiated by AI systems, RSF's Paris Charter on AI and Journalism (2023) stresses the need to preserve ethical principles of journalism as well as its economic viability, which requires journalists' active participation in the process of AI governance. In order to call the U.S. Congress to take action against the threats posed by AI, unions such as the News Guild-Communications Workers of America, the National Association of Broadcast Employees and Technicians, Writers Guild of America East and Writers Guild of America West wrote a letter demanding the protection of the journalistic work against AI and a collective bargain on AI policies in the work environment (Entralgo, 2024). The recent layoffs in news organizations should be approached as a warning sign for the precarious work conditions caused by AI technologies. For instance, Business Insider laid off 21 percent of its employees citing the increase usage of AI as a reason in an internal memo (Reuters, 2025). Associated Press, Fortune and Bloomberg Media are among the media outlets that laid off its personnel due to the latest challenges in the media market (Reuters, 2024; Tobitt, 2025; Moses, 2025). As suggested by some researchers, unionized media organizations better perform in terms of job security and training support of journalists for new technologies (Diakopoulos, 2023; Salamon, 2024). Thus, this study embraces a political economy approach to contextualize how AI transforms journalism in Türkiye.

While presenting the risks posed by AI technologies, most international and national studies argue that journalism should benefit from the opportunities that AI has to offer. In this respect, AI is found to be effective for automation practices such as routine news reporting and data analysis (Londoño-Proañó and Buele, 2025; Gül, 2024; Peña-Fernández, et al., 2023; Isik, et al., 2022; Noain-Sánchez, 2022; Tejedor & Vila, 2021; Túnuez-López, et al., 2021). Moran and Jawaid Shaikh (2022) find out that journalists who are responsible

from economic well-being of the organization (i.e. executives and funders) are more likely to embrace AI technologies and journalists who work on the ground are more skeptical towards the AI integration into the journalistic practices (p. 1769). However, replacement of journalists by automation depends on journalists' adaptation to AI. The preparation for the upcoming technologies and developing smart technologies are in the hands of journalists to maintain control over their profession (Broussard, et al., 2019). Considering the current turmoil as an epistemic crisis, AI technologies might offer 'epistemic opportunities' to strengthen journalists' authority over their profession (Perreault, et al., 2025). To achieve that, journalists need to incorporate the ethical standards into the algorithmic practices, revise educational trainings to improve digital skills and reinstate their expertise in the workflow (Møller, et al., 2024). Furthermore, Etike (2023) suggests active participation of journalists in the design of AI technologies, development of strategic business plans and cooperation between news organizations and tech companies (p. 994). Therefore, adaptation of journalistic skills and integration of ethical principles into technological developments appear as essentials to preserve the authority of journalists.

Yet, the economic design of AI systems and the market structure of media emerge among the most important factors that have influence on journalism. The structure of AI is open to be shaped either in the hands of the authoritarian power or in the service of public good. If the latter prevails, then adapting AI technologies in the newsrooms might offer journalistic autonomy from the power figures such as the digital platforms as Diakopoulos (2023) suggests. Yet, the financial capability is the determinant factor in to what extent a media organization can adapt new technologies. Small-scale independent news organizations will struggle to afford the expenses on AI. This would conclude in buying independence and autonomy, which only the media conglomerates will be capable of. Consequently, independent digital news media face another financial burden to employ skilled labor and maintain the necessary hardware. This, eventually, leads to an increased dependence on the digital platforms that offer easier access to

AI services (Simon, 2022, p. 1838). As the hopes flourish for more independent journalism with each innovation, not before long, the relations of power supercede and journalism finds itself rather in another struggle. The flexible design structure of AI in the hands of private corporations causes opaque decision-making processes, i.e. content removal or promotion decisions. Thus, the ability of AI systems in terms of collecting and processing data without notifying users poses immense risks on media freedom (Haas, 2020, p. 2). Besides, the emergence of AI as an invasive controlling actor facilitates third parties to exercise power over the information flow that might lead to the disintegration of journalism as an institution (Simon, 2024, p. 166). For this reason, the audience should be cautious about AI filtering mechanisms that value attention-catching and engagement-oriented content for profit rather than quality leading to the dominance of radical and polarized content in the online environment (Haas, 2020, p. 3). The Freedom on the Net 2023 report pointed out that the departments such as trust and safety, content moderation, human rights and public policy were the most affected teams during the mass layoffs in Twitter/X, Meta, Google, Microsoft, Twitch and Snap (Freedom House, 2023, pp. 20-21). This employment policy of the digital platforms demonstrates the importance given to the healthy information ecosystem by the profit-oriented corporations.

Furthermore, opaque decision-making processes of AI systems complicates news distribution even more due to the algorithmic bias and manipulation. Automation enabled by AI technologies is able to control each step of the information flow from making decisions about the circulation of content to how it is delivered to the audience. Within the context of its journalistic usage enabled in the digital platforms, Simon (2022) demonstrates four stages of AI's function in news production and distribution illuminating in what ways it could analyze and recommend content to the audience. "Selection of information" where AI makes decisions on what information to be produced, "production of news" in which it is utilized for creating, editing and archiving, in the third stage AI is used for personalization of news in the distribution process and in the last stage of "audience and

business analytics” AI functions for the prediction of audience behavior (Simon, 2022, p. 1834). Thus, in regimes governed by “authoritarian economic organisation of information” (Fuchs, 2020), AI is likely to become a medium of censorship and surveillance. Not only within the digital platforms, but also within the internet infrastructure such as internet service providers (ISPs) and hosting providers, AI systems could become more than a controlling mechanism for information dissemination. As already executed by the digital platforms in the form of automated content monitoring, AI systems will be deployed to filter content – in particular for “notice-and-takedown” decisions. Due to the multitude of daily content production, governments, ISPs and digital platforms incline to adopt automation to implement content removal decisions, which risks false takedowns and violation of media freedom and freedom of expression (Marsıf, et al., 2023, p. 100). Therefore, automation for time efficiency demands significant caution in terms of protecting human rights.

Vulnerability of media freedom caused by AI systems, in fact, starts at the infrastructural level. Adoption of AI technologies to function as a gatekeeper by ISPs can violate net neutrality and destabilize information ecosystem through practices such as zero-rating services, deep packet inspection, content blocking, bandwidth throttling and traffic prioritization (Digwatch, 2024). A brief online search confirms AI’s capacity to control information flow at the ISP level. Under cyber security services, AI solution companies offer infrastructure maintenance, automated network optimization that allows allocation of bandwidth and resources, tracking and prediction of the network traffic patterns services to ISPs. These companies advertise their business for their capacity to block illegal and threatening online activity with real-time detection. In spite that those services seem to serve to public good, they also pose a threat against different segments of civil society such as critical voices, investigative journalists and academics through AI systems’ ability to reach the source of online activity.

Global challenges in AI regulation and media freedom

The paradigm shift led by AI has caught governments and policymakers off guard. The confusion with how to integrate AI into daily life and political and economic systems channel governments to experiment in different approaches. As they seek to reap the benefits, they also make efforts to regulate it without being irrelevant and falling behind innovation. Learning from the past experiences with the digital platforms in which the regulatory frameworks were late to protect freedom of expression and market competition from opaque decision-making processes of the profit-driven digital platforms, European Union (EU) decided to take an early step to regulate AI technologies under a new legislation called the AI Act in 2024. While promoting the free market policy and innovation, the AI Act categorizes AI systems in four groups according to their risk levels: 1) unacceptable risk (i.e. social scoring systems and manipulative AI), 2) high risk (i.e. automated processing of personal data and detention of decision-making patterns), 3) limited risks (i.e. chatbots) and 4) minimal risk (i.e. AI-enabled video games and spam filters) (EU Artificial Intelligence Act, 2024). In addition, OSCE emphasizes two polar opposites of AI. Alongside with its capacity to enable censorship, manipulate public discourse and surveillance, AI systems can contribute to media freedom and freedom of expression as well (Haas, 2020). The emphasis of OSCE reiterates the fact that what guides technology is the interests of political and economic groups. Results of the Freedom on the Net 2023 report reflects this threat stating that the developments in AI technologies enable governments to implement concealed censorship with unprecedented accuracy (Freedom House, 2023, p. 13). For instance, the demand of BTK (Information and Communication Technologies Authority of Türkiye) from the ISPs to deliver the identities of the internet subscribers and their web traffic logs raised criticism of citizen surveillance and violation of privacy (Sarp Nebil, 2022). Such demands of the government authorities exemplify how governments could utilize the use of AI in cooperation with ISPs.

For this reason, an urgent need emerges to raise awareness for AI's responsible application considering the inclination towards its unethical usage. To highlight its ethical and effective use in journalism the Council of Europe (2023) published the "Guidelines on the Responsible Implementation of Artificial Intelligence Systems in Journalism". In reference to the Article 10 of Convention for the Protection of Human Rights and Fundamental Freedoms that guarantees freedom of expression and free information flow without state interference, the guideline argues that Article 10 indirectly includes AI systems, which indicates its compliance with human rights and extends to media professionals, digital platforms and ISPs as content producers and distributors (Council of Europe, 2023). In addition, the Council of Europe (2023) suggests the concept of journalistic artificial intelligence system to distinguish AI technologies that serve news production practices such as research, investigation, fact-checking, news writing and audio-visual content creation, as well as news distribution to customize and personalize news content, enhance news recommendation and audience engagement (p. 7). Therefore, the guideline urges AI providers to embrace transparency and to offer affordable products, and recommends public authorities to guarantee a competitive market and collaborate with news media and civil society (Council of Europe, 2023).

While Europe makes efforts to establish liberal and democratic values, governments in Asia pursue policies to tighten information control. For instance, the Chinese government has invested in the development of a national large language model that matches with the socialist principles of the country and supervises local AI companies on content filtering processes through a set of keywords and phrases (McMorrow & Hu, 2024). Russia is another country that instrumentalizes AI technologies to control information flow and online speech. Reporters Without Borders (2024) alerts international public about Roskomnadzor's (Russian federal information technologies and mass communication supervisory authority) experimentation with neural networks and large language models to extend its control over information flow. Iran, on

the other hand, prioritizes cyber security, dissemination of disinformation and citizen surveillance rather than the regulation of AI or investment on its own AI systems (Tkeshelashvili & Saade, 2024). All in all, innovation in AI technologies appear as a global phenomenon that majority of the states work to implement policies to take advantage from it.

Regardless of geopolitics and ideology, media freedom and freedom of expression are facing risks arising from governments and profit-oriented market structure of technology. The regulation attempts of Europe struggle to be effectively implemented as a result of several deregulatory steps in the name of encouraging innovation and market competition (Lazaro Cabrera, 2025). While the European liberal economic regime is unlikely to protect free speech, the oppressive political regimes in Asia are likely to further restrain freedoms. The global political and economic approach towards AI highlight the need for a structural transformation to guarantee a democratic and free information ecosystem.

AI landscape in Türkiye

According to the 2025 report issued by the Turkish Artificial Intelligence Initiative (TRAI) the number of AI start-ups reached 411, marking an approximately 17-fold increase since the foundation of the first AI initiative in 2017. Computer vision, machine learning, prediction and data analysis are three areas where Turkish AI initiatives prefer to be active the most (TRAI, 2024) and AI technologies are found to be more efficient in finance, transportation, energy and public services (TRAI, 2025). Aiming to prevent a monopolistic market structure and ensure the technological independence of Türkiye, the Digital Transformation Office and the Ministry of Industry and Technology introduced the National Technology Leap. Also, in accordance with the government's policies on information and communication technologies, the National Artificial Intelligence Strategy 2021-2025 was announced within the scope of the Digital Türkiye vision. The government commits to support and cooperate with the professionals to enhance the AI

infrastructure, regulate the AI industry and encourage the training of skilled workers and experts under this strategy. Additionally, the National Artificial Intelligence Strategy 2024-2025 Action Plan pledges to establish technical and ethical standards, develop a Turkish large language model and prepare educational materials to improve algorithmic thinking and AI-applied digital skills in children.

In Türkiye there is no regulation specific to AI, however a draft bill was proposed by a parliament member in June 2024. The draft bill offers eight articles that outlines the key concepts and institutions in the AI industry such as transparency, accountability, security and fairness. On the other hand, Ankara Chief Public Prosecution started an investigation against X's AI application Grok on the grounds of violating the law on crimes committed against Atatürk and insulting the religious values and the President. The prosecution imposed access blocking decision, which made Türkiye the first country that censors Grok (BBC, 2025). Türkiye's recent practice towards AI demonstrates that the government prioritizes the information control over guaranteeing media freedom and a healthy information ecosystem supported by AI technologies.

Nonetheless, non-governmental organizations continue to work proactively for the ethical adoption of AI systems. In 2019, the bars of Istanbul, Ankara and Izmir issued the country's first report on AI and how to regulate it with a focus on regulatory challenges, i.e. copyright and patent, and ethical concerns (Kizrak, et al., 2019). Despite the efforts made by some parts of the society, Türkiye continues to remain as a follower of the global technological trends rather than acquiring a leading position.

Methodology

Building on the existing literature cited above, this research is based on the hypothesis that the political economic structure of AI technologies threatens media freedom by restructuring the news production and distribution processes. In order to understand and explore AI-led transformation in journalism, this research poses an analytic question

that illustrates how independent digital news media adapts AI technologies into the news production process. In order to develop an in-depth analysis, the semi-structured interviews were conducted with journalists who work at independent digital native news media organizations and experts on media policies, communication infrastructure and digital platforms. The reason why the independent digital native news media has been chosen as the sampling group relies on two factors. First, being independent from any affiliations with a political or economic group would provide more accurate findings. Second, having started as only-digital would provide better understanding of how digital mechanisms work in the news production and distribution processes. Within this context, the interview questions consisted of how the interviewees approach AI, to what extent the interviewees have integrated the AI technologies into newsroom, whether they are concerned about employment, what concerns they have regarding to the incorporation of AI into the journalistic practices in terms of automation and its impact on news quality. However, the participants' lack of financial resources, technical skills and limited experience with AI became the limitations of this research.

The interviews were conducted between July and October 2024, and their duration ranged from 40 to 103 minutes. In total 61 potential participants were contacted who are journalists, management-level employees of the ISPs and digital platforms, and experts in media law, technology, telecommunications and digital platforms. Only 29 individuals confirmed the interview request. The other 32 either did not respond or initially accepted the request, but stopped responding in the interview scheduling process. Significantly, none of the management-level employees of the ISPs and digital platforms confirmed to participate in the research. Therefore, a total of 29 participants were interviewed, 24 of whom are journalists working at independent digital native news outlets and five are experts. In order to protect the privacy of the interviewees, their identities are anonymized and each of them has been given random numbers between 1 and 29 (i.e. Interviewee 1, Interviewee 12, Interviewee 23). At the time of the interviews, among

the journalist interviewees, three were owners of CEOs at their organizations, 11 held the title of editor-in-chief or coordinator, four were news coordinators, three editors, and the remaining three were either freelancer or self-employed. The expertise areas of the expert interviewees were as the following; two experts work on telecommunications and the internet infrastructure, one expert on internet governance and freedom of expression, one in media law and policies, and the remaining expert works on technology and digital platforms. The majority of the journalist interviewees who hold managerial positions have been in the industry for more than 20 years and have experience in both traditional and digital media. Many who held the positions of news coordinator and editor started their profession in digital outlets. The interviewees' current workplace at the time of the research were mostly founded after 2016 and born as independent digital-native news organizations. These organizations dominantly rely on advertising revenue generated from search engines and digital platforms, and also funding.

Table 1 below provides the participant categories at the time of the interviews, which allows readers to contextualize the interviewees' statements in relation to the subject matter.

Table 1. The Categories of the Interviewees

Owner/CEO	Interviewee 12
	Interviewee 19
	Interviewee 20
Editor-In-Chief/Coordinator	Interviewee 1
	Interviewee 3
	Interviewee 6
	Interviewee 7
	Interviewee 8
	Interviewee 15
	Interviewee 22
	Interviewee 25
	Interviewee 27
	Interviewee 28
News Coordinator	Interviewee 14
	Interviewee 16
	Interviewee 17
	Interviewee 21
Editor	Interviewee 2
	Interviewee 5
	Interviewee 11
Self Employed/Freelancer	Interviewee 4
	Interviewee 13
	Interviewee 23

Expert	Interviewee 9 (Expert on the telecommunications industry and the internet infrastructure)
	Interviewee 10 (Expert on technology and digital platforms)
	Interviewee 18 (Expert on the telecommunications industry and the internet infrastructure)
	Interviewee 24 (Expert on media law)
	Interviewee 26 (Expert on internet governance and free speech)

The interview data were systematically coded and statements with similar content were grouped under emerging themes. These themes were analyzed in an argumentative framework, supported by quotations from the interviewees. The findings section was structured around these thematic categories of journalists' view on AI regarding to precarity and unemployment, the significance of human in journalistic practices, the lack of financial and technical resources, the positive perception on automation, the disregard of the controlling power of AI over information flow and the criticism against the capitalist design of AI technologies.

Findings and discussion

Journalists' perception of AI

Only three out of 29 participants opposed the adaptation of AI technologies into journalism. These interviewees who are all journalists stated that they have never used AI in the news production process and disagreed with its integration into journalism. "I do not think it is ethical to let a non-journalist being do the job," and "I do not wish to see myself or my colleagues lose their job," were two notable statements expressed by those interviewees. The remaining interviewees shared a positive approach towards the integration of AI despite their concerns. Besides, majority of the interviewees argued that the work of a journalist cannot be replaced with any technological innovation. Yet, they agree on the inevitability in the transformation of journalism led by AI-driven paradigm shift.

Precarity and fear of unemployment were common concerns of the interviewees whether they agree or disagree with AI incorporation into the journalistic practices. In contrast to the opposing

group, the interviewees who share a positive approach have a limited experience with AI systems and are open to explore the opportunities AI has to offer in spite of their concerns. AI technologies are yet to be adopted to a wide extent in the newsroom, however the interviewees expressed that they prefer to benefit from AI particularly in two areas that they struggle to afford during the news production process. One area is the production of audio-visual content and the other is voiceovers. The reason why they benefit from AI the most in those areas is to maintain their presence and increase reach on the digital platforms such as Instagram, TikTok and YouTube without having to bear with labor cost. Yet, this demonstrates ambivalence between journalists' concern over unemployment and their perception of AI as an opportunity to reduce the cost of employment. An expert interviewee, on the other hand, argues that AI systems will take over tasks such as reporting breaking news, weather forecast and sports match results. In that sense, decrease in employment to fulfill routine tasks is expected. However, journalists' contradictory approach towards AI is quite paradoxical.

Ambivalence in terms of feelings of ethical and economic concerns as well as eagerness to explore appears as the key approach of the interviewees regarding to the integration of AI technologies in journalism. For instance, while recognizing the efficiency in automation of routine tasks, i.e. weather reports, Interviewee 1 points out the risks against accuracy and news quality posed by AI unless properly monitored. "In my opinion, it is in an experimental phase for media," the interviewee argues (Interviewee 1, personal communication, July 17, 2024).

The indispensability of human in journalism

Subsequently, Interviewee 29 states that AI can serve as an assistant to a journalist as long as humans are in control and in charge of decision-making processes.

The news, in the end, is something we write, control and publish. But our friends here sometimes experiment with AI on producing visuals, graphics and animations. As long as a human-based control mechanism works

and the humans are the ultimate decision-makers, artificial intelligence will improve journalistic techniques. (Interviewee 29, personal communication, August 1, 2024)

Interviewee 3 also emphasizes the importance of human involvement in news production. In spite that they have not used AI yet at their organization, they discuss the ways in which they can incorporate AI technologies without causing reduction in employment. The interviewee also predicts that AI could help generate advertising income in addition to its assistance in the visual content production. Nonetheless, Interviewee 3 argues that the Covid-19 period reassured the significance of journalists and the human interaction.

Journalism is like this: You go out and trace the story. Then, you come back and knock the door. Starting from your friend that opens the door for you, you create your news story. You begin discussing about the story with another reporter, editor or you write as you discuss it with your colleagues. This is what journalism is. How will I tell AI to go out and trace the news and then come back to discuss? (Interviewee 3, personal communication, July 23, 2024)

In this respect, Interviewee 22 questions the human exclusion from the news production process in spite of the benefits of AI technologies in research, editing, translation, etc. Additionally, the interviewee argues that those who prioritize profit over news quality and abuse SEO tactics will eventually misuse AI as well.

Within this context, four interviewees particularly underlined the importance of the human element in journalism by stating that AI cannot replace journalists in terms of insight, writing style and individual perspective. Interviewee 14 was one of the participants that actively use AI for tasks such as translation, visual production and writing lifestyle content, i.e. tips for staying cool in summer. However, just like Interviewee 3, Interviewee 14 stresses that it is not possible to replace a journalist since a machine cannot report from conflict zones. That's why, the interviewee disagrees with the concerns over unemployment. They recognize that the need to employ multiple editors might decrease, but argue that new technologies will create different work areas. "I certainly think that journalists must benefit from artificial intelligence.

Journalism is not a profession that will ever die," the interviewee marked (Interviewee 14, personal communication, August 21, 2024). In line with these interviewees' perspectives, Interviewee 29 also draws attention to journalists' need to adapt early to innovation in order to successfully preserve the value of journalistic work during this paradigm shift, which confirms the emphasis made by Broussard et al. (2019) for the significance of preparation and early adoption to new technologies.

The lack of resources as a challenge

It is observed that the interviewees acknowledge the intrusion of AI and its inevitable integration into their professional life. Therefore, improving their digital skills to adopt new technologies appear as some of the key challenges. Interviewee 28 was the only interviewee stating that they participated in a few AI training sessions in order to learn how to create AI-assisted visual content and generate voiceovers. Yet, during the trainings the interviewee observed the reluctance of their colleagues towards AI technologies.

When I first started my job here, I told my colleagues that 2023-2024 is said to be the year of artificial intelligence and we need to adapt ourselves in advance. The team is not very enthusiastic. We did a couple of trainings, but they should practice with it on their own time as well. (Interviewee 28, personal communication, August 8, 2024)

Lack of financial resources to integrate AI technologies is another critical challenge for independent digital news media. Two interviewees mentioned that they lack financial resources to meet new technological demands. For instance, Interviewee 27 mentions that they occasionally benefit from AI for image creation, generating subtitles and voiceover, however they have not been able to use AI for assistance in the news production due to the economic inadequacies. The interviewee shared an anecdote about how one of his friends make use of AI technologies.

They said that they built a system based on AI. It scans the most important websites in 48 countries, pulls the breaking news from them, translates to Turkish, tags and publishes them on their own website. Obviously,

this is doable. However, you need a certain capacity for that. That friend works in the finance business and has a software programmer at their organization. When these two things come together in media, a new dimension emerges. But we cannot afford it. (Interviewee 27, personal communication, August 14, 2024)

The interviewee's statement above demonstrates how financial capacity becomes a decisive factor in the adoption of AI technologies. As Simon (2022) highlights, this financial asymmetry not only leads to an increasing dependency of small-scale independent news outlets on digital platforms, but creates an information ecosystem where independence and autonomy have to be bought.

Automation as a cure to commodification of journalism

On the other hand, current state of journalism is alarming even without AI interference due to its quantity-based structure and click-based revenue model. Within this context, Interviewee 4 perceives AI technologies as an encouraging factor for quality news production and rejects the argument of precarity caused by AI. According to their view, simple visual design and copy-paste news writing do not suit to the standards of quality journalism. Unlike Diakopoulos's (2023) prediction about AI's capacity to increase commodification of journalism, the interviewee argues that automation of these tasks could serve to be a wake-up call for journalists.

It will affect my salary through indirect factors. There are so many editors in our field to have been hired to copy and paste. So, these people are not paid enough and they are pulling the media industry down. I am a university-graduate, so I neither want to copy-paste nor work for that salary. Really, some things need to change and it will not change with personal resistance. Then, what will happen? We will wait for a technological breakthrough. Therefore, I perceive this automation process of copy-pasting and simple visual production in a positive way. It will turn journalism back into its former long-form style in the digital age. (Interviewee 4, personal communication, September 10, 2024)

In addition, not having to publish tens of stories on a daily basis will provide more time to produce

quality, long-form, investigative content and increase the worth of journalists, according to the interviewee. In Perrault, et al. (2019)'s words automation might open a window for epistemic opportunities to reassure the journalists' authority and contribute to the quality news production.

How can a journalist publish 55 news stories per day? The media boss says 'isn't it what we are doing? You copy and paste eventually. I will pay you a little more than minimum wage.' This is their mindset. They must have forgotten what journalism is. This leads to the industry further down. It will be worse unless automation comes in. (Interviewee 4, personal communication, September 10, 2024)

Interviewee 6 shares a similar approach with Interviewee 4 and argues that the unemployment threat caused by AI will motivate journalists to improve their skills and expertise areas. Within this context, instead of creating human-robot journalists, having machines do the job will increase the worth of journalism itself. As journalists become unique experts difficult to be replaced by machines, journalism will reach higher and stronger quality in the long term.

The blind spot: AI as a controller of the news distribution process

While focusing on AI's capabilities in terms of efficiency in the production, most majority of the interviewees disregard the impact of AI technologies in the news distribution process, i.e. content filtering. Since they stated that they have not experienced any censorship attempts practiced by AI technologies – they often separate algorithmic bias and AI systems from each other – they tend to overlook AI's capacity to control information flow. The disregard of the information control capacity of AI through third parties, as Simon (2024) highlights, emerges as the blind spot in Türkiye's news media ecosystem. Only one interviewee, who is an expert on technology and digital platforms, pointed out the power relations deepened by AI. Interviewee 10 argued that AI serves as an instrument to strengthen the existing power structure, which necessitates a critical analysis of the attention economy driven by the digital platforms.

What is the problem with the platforms? It is that they are built on a business model that relies on the attention economy. Everyone will look at them, thus everyone will buy ad space from them. That is how they earn advertising revenue. The business model of AI is to capture the jobs. It creates automation. Thus, the more strategic news organizations will integrate AI technologies in a better way and get ahead of the others. The powerful ones will continue to become more powerful. Journalism will come to a place where the need for human will be decreased immensely since the clickbait journalism has already diminished the quality of journalism and paved the way for automation. (Interviewee 10, personal communication, July 30, 2024)

In a way, Interviewee 10 indicates the death of journalism as a result of automation. In response to the question of whether AI will increase the quality of journalism, the interviewee replied that there is no such thing as quality journalism – only high-quality interface. Traditional values of journalism does not have a place in this new paradigm. The interviewee underscores that AI capabilities extend beyond content production to practices of microtargeted news display such as creation of customized and personalized interfaces of the same website for each user. For instance, each reader of the New York Times will have a different New York Times experience tailored to their interests in near future. Therefore, automation of news production and distribution will decline the significance of journalism. Instead, long-form cultural products, will replace traditional journalism such as magazines and books. Even though, their predictions sound rigorous, the main theme of Interviewee 10's arguments align with the other interviewees' positive approach towards the transformation of journalism that will lead to an increase in value driven by automation. Also, it should be noted that the digital platforms have already been customizing content for each user and prioritizing the profit over a healthy information environment as reported in the Freedom on the Net 2023 report.

Interviewee 12, though, does not perceive customization enabled by AI systems as a threat for the future of journalism. The interviewee's news organization has fully embraced AI technologies in the production and distribution processes since

their foundation. They use AI to create microtargeted email news bulletins, collect user data and create personalized content. Similar to other interviewees, the interviewee stresses the importance of early adoption to innovation. Therefore, only those who resist the change are under threat by new technologies. According to Interviewee 12, in the age of AI three factors must be considered when starting a digital news initiative: a solid business strategy, value assessment of the organization for the media industry and measurement of the market volume. These factors determine whether AI is an opportunity or a threat for the news organization.

Most journalists in Türkiye are robot journalists. They copy and paste reports coming from the news agencies. In this system, of course, AI is a threat. In this system it is not journalism. What is done is something relied on programmatic advertising and quantitative production. This is the consequence of the save-the-day mentality. (Interviewee 12, personal communication, October 4, 2024)

In spite that Interviewee 12's organization uses AI for microtargeting and customization of content, their approach misses the role of other AI systems beyond their control. They still benefit from the distribution power of digital platforms and search engines fuelled by AI. Therefore, the impact of AI in information flow currently lacks the attention needed in Türkiye's news media.

Capitalist ideology, AI and media freedom

Throughout the interviews, under different themes, many interviewees emphasized the structural power relations situated in AI technologies and they implicitly emphasize the importance of knowledge production over information production that hinders journalism from fulfilling its public-good duty. Unless this way of doing journalism changes, independent digital news media will have to yield to the forces of the capitalist market structure, which jeopardizes media freedom and pluralism. As Interviewee 19 stressed that the hegemonic ideology is embedded within the design and structure of AI, Interviewee 20 also underlined the reality that the majority of today's AI systems are produced by a group of privileged white

Americans in the Silicon Valley that reflect their narrow view about the world. The interviewees' concern align with critical political economy scholars who argue that AI systems are concentrated in a handful of corporations whose business models prioritize the capitalist accumulation strategies rather than public interest (Fuchs, 2020; Zuboff, 2019; Couldry & Mejias, 2019). As mentioned above, Interviewee 10's argument highlights how AI reinforces attention economy by optimizing content personalization, which is profit driven and under the dominance of powerful actors in the information ecosystem. However, these interviewees do not reject the use of AI in journalism. Noting the negative impact of automation, these interviewees suggest that investigative journalism will flourish even further. "When you devalue something and destroy it, sometimes it causes a purge," argues Interviewee 20 (personal communication, August 22, 2024). Thus, majority of the interviewees continued to express a paradoxical approach throughout the interviews. As they argue that the prioritization of profit due to the capitalist market structure of news media will likely bring the end of journalism in the face of AI systems, they also seek opportunities offered by the same AI systems that could enforce the thriving of long-form and investigative journalism, which what makes journalism irreplaceable.

Yet, from a political economic perspective, the findings demonstrate that AI not only deepens the existing inequalities that the small-scale independent news media face in their relations with the global technology companies, but also reproduces the hegemonic ideology of those who control its infrastructure. Unless the regulatory frameworks of states and international bodies address the capital concentration in terms of antitrust measures, the need for public investment in alternative infrastructures or funding mechanisms that ensure the viability of independent media, journalism will likely to remain subordinate to the ideological and economic hegemony of existing AI providers.

Conclusive remarks

Journalists facing the inevitability of AI seek ways to benefit from its opportunities without being re-

placed by it. The most significant finding of the research is the paradox the interviewees are in regarding their relationship with AI technologies. Although precarity and loss of control over their profession appear as two major concerns, automation of routine journalistic tasks is perceived as a catalyst to restore journalism back to its public-good duty by reinstating the importance of investigative and long-form journalism. Therefore, AI emerges as both a threatening and redemptive actor for the news media.

Early adoption to AI technologies is critical for journalists to maintain their authority over their profession. However, lack of economic resources and technical skills are key challenges in particular for small-scale independent digital news media in Türkiye. With the limited resources at their disposal, they use AI technologies in the news production process for tasks such as audio-visual content production, voiceovers and subtitles. Thus, they desire to utilize AI as an assistant that saves time. Yet, ethical concerns regarding accuracy, as well as the idea of assigning labor to a machine, contribute to the ambivalence expressed by the interviewees. For this reason, preserving human authority over the decision-making process appears as a critical condition for AI integration into journalism.

Beyond these challenges, the findings also show that AI technologies are embedded in the already-existing capitalist and ideological structures. As interviewees pointed out, AI systems reflects the values of their corporate creators while their implementation reinforces the prioritization of the profit-driven attention economy. In that sense, AI not only transforms news production, but also expands the dominance of capitalism over journalism and increase the structural asymmetries between independent news media and global technology corporations.

The blind spot of the findings emerges as the interviewees' disregard on AI's decision-making power over news distribution. Journalists' own disinterest further risks media freedom and pluralism considering the capitalist market structure of information and communication technologies. Considering the financial struggles of the independent digital news media, the current market

structure forces journalists to produce news in line with the strategies of the actors in the information distribution process such as digital platforms and AI systems, which ultimately harms media freedom due to the prioritization of the profit-driven news production to generate revenue. Therefore, political and economic policy interventions that target the market concentration in the information ecosystem such as antitrust regulations, public funding for technological infrastructure and also independent media emerge as crucial steps for regulatory bodies to take in order to counteract the hegemonic political and economic ideologies inscribed in AI. In addition, raising awareness of media professionals about the structural problems embedded within AI systems is crucial to sustain pluralism and freedom in media. As a result, journalists' control in the production and distribution processes will make them irreplaceable.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *The study involved semi-structured interviews with 29 participants. Data were collected on a voluntary basis, and confidentiality and anonymity were strictly maintained. If required, details of ethical approval can be provided by the author.*

Informed Consent: *Informed consent was obtained from all participants prior to the interviews.*

Data Availability: *The datasets generated and analyzed during the current study are not publicly available due to privacy and confidentiality agreements but are available from the author on reasonable request.*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

Examining the Impact of Digital Technologies on the Generative Artificial Intelligence Integration of Businesses in Türkiye

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Abstract

Generative Artificial Intelligence (GenAI), which can autonomously produce textual, visual, auditory, and video content, goes beyond creativity and offers significant advantages in business processes. This study aims to examine the relationship between the digital processes used in firms and employees' levels of artificial intelligence usage and their intention to use it, within the framework of four fundamental factors of GenAI: performance expectancy, effort expectancy, facilitating conditions, and social influence. Data were collected from employees working in 213 companies operating in Türkiye and analyzed using regression analysis and Pearson correlation methods. The findings indicate that the digital processes implemented in firms do not have a statistically significant effect on these four factors. In contrast, employees' intention to use artificial intelligence has a significant and positive effect on performance expectancy and social influence. Moreover, the current use of artificial intelligence is found to create significant and positive effects on effort expectancy, facilitating conditions, and social influence. Overall, the results demonstrate that, rather than the quantitative presence of digital processes, employees' attitudes and tendencies toward artificial intelligence play a more decisive role in the integration of generative AI.

Keywords: Generative Artificial Intelligence, Digital Process, Artificial Intelligence Usage

Öz

Metin, görsel, işitsel ve video içeriklerini özerk biçimde üretebilen üretken yapay zekâ (ÜYZ), yalnızca yaratıcılıkla sınırlı kalmayıp iş süreçlerinde de önemli avantajlar sunmaktadır. Bu çalışma, firmalarda kullanılan dijital süreçler ile çalışanların yapay zekâ kullanım düzeyleri ve yapay zekâ kullanım niyetleri arasındaki ilişkiyi; ÜYZ'ye ilişkin dört temel faktör — performans beklentisi, çaba beklentisi, kolaylaştırıcı koşullar ve sosyal etki — bağlamında incelemeyi amaçlamaktadır. Araştırma kapsamında, Türkiye'de faaliyet gösteren 213 firmada çalışanlardan elde edilen veriler regresyon analizi ve Pearson korelasyon yöntemleriyle değerlendirilmiştir. Analiz sonuçlarına göre, firmalarda kullanılan dijital süreçlerin söz konusu dört faktör üzerinde anlamlı bir etkisi bulunmamaktadır. Buna karşılık, çalışanların yapay zekâ kullanma niyetleri performans beklentisi ve sosyal etkiyi anlamlı ve pozitif yönde etkilemektedir. Ayrıca, mevcut yapay zekâ kullanımının çaba beklentisi, kolaylaştırıcı koşullar ve sosyal etki üzerinde anlamlı ve olumlu etkiler yarattığı görülmektedir. Sonuçlar, dijital süreçlerin niceliksel varlığından ziyade çalışanların yapay zekâya yönelik tutum ve eğilimlerinin, üretken yapay zekâ entegrasyonunda belirleyici olduğunu göstermektedir.

Anahtar Kelimeler: Üretken Yapay Zekâ. Dijital Süreçler, Yapay Zekâ Kullanımı.

Introduction

Recently, Generative Artificial Intelligence (GenAI) has become a prominent field of study in the business world. With the global proliferation of digital technologies, including AI, organizations face increasing pressure to embrace these innovations and restructure operations in line with Industry 4.0 (Lindberg, 2025). GenAI, intended to produce complex material, is used in many fields (Cao et al., 2023; Dwivedi et al., 2023; Kasneci et al., 2023) and can significantly alter teaching and learning approaches (Megahed et al., 2023). It improves efficiency, drives creativity, and generates economic benefits across industries (Ali et al., 2025).

Using user instructions, GenAI creates text and picture material (Lim et al., 2023; Wu et al., 2023). Gupta and Srivastava (2024) note that GenAI is a paradigm shift characterized by its ability to innovate beyond and create new datasets. While AI mimics human intelligence broadly, GenAI focuses on producing original content like language, music, or images (Lim et al., 2023). OpenAI debuted Voice Engine in March 2024, generating natural-sounding speech with minimal input (OpenAI, 2024). GPT-4o, released in May 2024, expanded GenAI's multimodal applications across industries.

GenAI is a disruptive technology gaining a large user base due to human-like responses and ease of use. It benefits businesses through productivity, efficiency, and competitive advantage (Ünal and Kılınç, 2024). Adoption in business is increasing, but academic research is still limited. Existing studies are largely theoretical (Bozkurt, 2023; Avci, 2024; Ünal and Kılınç, 2024), with few firm-level analyses.

There is a stream of literature investigating acceptance intention to continue using GenAI. Ali et al. (2023) found IT infrastructure, R&D, and corporate investment facilitate adoption, while inconsistent policies hinder it. Dong et al. (2024) emphasized organizational listening and readiness. Kumar (2025) surveyed 277 executives, highlighting information integrity, transparency, and ethical leadership. Rana et al. (2024) studied institutional pressures and principles like accuracy and fair-

ness. Chan and Choi (2025) classified GenAI applications in marketing. Kong et al. (2024) surveyed 367 Hong Kong teachers, showing attitudes and perceived usefulness drive GenAI use. Dogru et al. (2025) explored advantages and limitations in tourism, while Gursoy et al. examined ChatGPT in hospitality. GenAI is also applied in healthcare (Zhang and Kamel Boulos, 2023), education (Baidoo-Anu and Ansah, 2023), marketing (Kshetri et al., 2023), banking (Sleiman, 2023), and fashion (Harreis et al., 2023).

This research aims to explore how the digital technologies implemented within organizations relate to AI applications and orientations, as well as employees' perceptions of GenAI usage, focusing on performance expectancy, facilitating conditions, effort expectancy, and social influence. The research aims to enrich the existing literature by addressing this gap through a regression analysis of survey data collected from employees working in diverse companies. Specifically, it examines the relationship between the digital technologies utilized in business processes, employees' current use of artificial intelligence, and their willingness to adopt AI—key components of generative AI innovation. Furthermore, the study investigates how factors such as performance expectancy, facilitating conditions, effort expectancy, and social influence align with generative AI adoption. Drawing on the findings, the study ensures actionable recommendations for organizations aiming to improve their adoption and integration of generative AI technologies.

The paper is structured as follows: the theoretical framework, methodology and data collection, findings, and conclusion.

Theoretical Framework

This section presents the study's conceptual framework, including an overview of GenAI and its types.

Generative AI (GenAI): GenAI generates text, images, audio, and video from multimodal input data (Bengesi et al., 2023) and is expected to enhance business processes, customer interactions, and innovation across industries like entertainment,

manufacturing, and healthcare (Ooi et al., 2023; Kar et al., 2023; Lv, 2023).

Large Language Models (LLMs): LLMs like GPT-3 and GPT-4 are deep learning models pre-trained on large datasets to understand and generate human-like language, supporting tasks such as text generation, summarization, translation, decision-making, and content creation (OpenAI, 2024).

AI Content Tools: AI-driven content tools create written material with minimal human input using machine learning and NLP, widely used in marketing, social media, and professional writing, offering multilingual support and SEO optimization (Gao et al., 2023).

AI Image Generation: Techniques like GANs and CAN generate realistic visuals with minimal human input, transforming digital art, design, and corporate visual content creation (Elgammal et al., 2017).

AI Voice Generation: AI speech technologies enable text-to-speech, voice transfer, and cloning, enhancing virtual assistants, audiobooks, accessibility, and user experience (Miniota et al., 2023).

AI Video Generation: AI video tools streamline creation and editing, supporting content creators in education, entertainment, and media production (Shibuya et al., 2025).

Methods

The study universe comprised companies in Türkiye, with employees from 213 companies sampled. Sample size was determined using G*Power (v3.1.9.4), requiring at least 84 observations for correlations ($\alpha = 0.05$, power = 0.8), so the actual sample exceeded this minimum.

Multiple sampling methods were employed: snowball sampling via WhatsApp (Biernacki & Waldorf, 1981) for hard-to-reach participants, complemented by convenience and simple random sampling to improve accessibility and representativeness (Etikan, Musa, & Alkassim, 2016; Field, 2005).

The study employed descriptive, exploratory, and correlational methods. The descriptive method identifies the current state of AI in businesses, including usage extent, sectors, areas, and willingness for adoption. The exploratory method seeks deeper insights, while the relational method examines relationships between Digital Processes, Desire for AI Use, AI Use, and Generative AI Use. In addition to descriptive and exploratory approaches, regression analysis was employed to examine the relationships between Digital Processes, Desire for AI Use, AI Use, and Generative AI Use within the scope of Generative AI factors. This analysis provided deeper insights into the predictive and explanatory power of these variables, revealing the extent to which digital transformation processes and organizational intentions shape the adoption and utilization of generative AI technologies.

The survey was the main data collection instrument. The first section included 15 demographic questions and items about digital processes (e.g., CRM, ERP, RPA, inventory tracking). From these, the variable "digital technology usage" was created. Similarly, questions on AI applications (e.g., chatbots, customer segmentation, product recommendations, profitability analysis, demand estimation, and customer satisfaction) formed the "AI Use" variable. The number of responses to "Subjects where AI would be useful" created the "AI Usage Desire" variable.

In the second section, 20 items measured the use of generative AI in businesses, with 7 items for "Performance Expectancy," 5 for "Effort Expectancy," 3 for "Facilitating Conditions," and additional questions on "Social Influence," rated on a 5-point Likert scale. The "Generative Artificial Intelligence Acceptance Scale" by Yilmaz et al. (2023) was used to assess adaptation to generative AI in Türkiye.

Table 1. Factors and Items

Factor Number	Factor Name	Number of Questions
1	Performance Expectancy	7
2	Effort Expectancy	5
3	Facilitating Conditions	3
4	Social Influence	5

Ethical Approval, Survey Instrument, and Data Collection

This study was approved by the Istanbul Medipol University Social Sciences Ethics Committee (20.01.2025-17637). Participants were Turkish citizens over 18, limited to one response per person via Google account verification. Data were collected anonymously using Google Forms, with consent obtained prior to participation, and processed in R Studio. Snowball and convenience sampling were employed, contacting participants via WhatsApp without public sharing to ensure authenticity. Snowball sampling addressed difficulties in accessing the full population (Patton, 2014). Following social science guidelines (Field, 2005; Gorsuch, 1974), 213 responses were collected between October 10 and November 31, 2024.

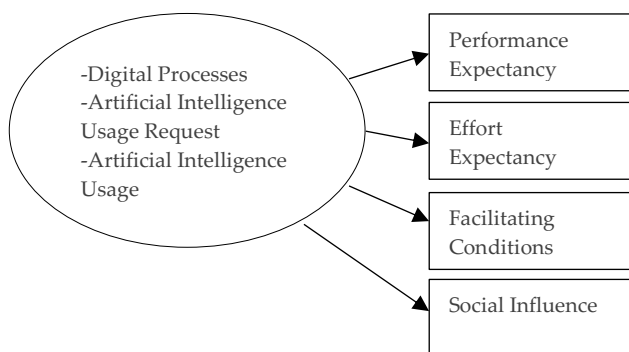


Figure 1. Research Model

Research Hypotheses are shown below:

H1: There is a significant relationship between Digital Processes and Performance Expectancy.

H2: There is a significant relationship between Artificial Intelligence Usage Desire and Performance Expectancy.

H3: There is a significant relationship between Artificial Intelligence Usage and Performance Expectancy.

H4: There is a significant relationship between Digital Processes and Effort Expectancy.

H5: There is a significant relationship between Artificial Intelligence Usage Desire and Effort Expectancy.

H6: There is a significant relationship between Artificial Intelligence Usage and Effort Expectancy.

H7: There is a significant relationship between Digital Processes and Facilitating Conditions.

H8: There is a significant relationship between Artificial Intelligence Usage Desire and Facilitating Conditions.

H9: There is a significant relationship between Artificial Intelligence Usage and Facilitating Conditions.

H10: There is a significant relationship between Digital Processes and Social Influence.

H11: There is a significant relationship between Artificial Intelligence Usage Desire and Social Influence.

H12: There is a significant relationship between Artificial Intelligence Usage and Social Influence.

Findings

This section presents the demographic characteristics of employees and the main results.

Demographic Frequency Analyses

Table 2 summarizes the demographic distribution of employees by gender, age, education level, marital status, and professional experience, reported as frequencies and percentages.

Table 2. Demographic Istatistics of Participant- Descriptive Statistics

Gender	Frequency (N=213)	%
Male	141	66,2
Female	72	33,8
Age	Frequency (N=213)	%
< 24	47	22,07
25-34	122	57,28
35-44	35	16,43
45-54	9	4,23
Education Level	Frequency (N=213)	%
Bachelor's degree	155	72,77
High School	5	2,35
Master's degree	29	13,62
Vocational School	24	11,27
Job	Frequency (N=213)	%
Junior Manager	14	6,57
Company Owner	10	4,69
Operational Manager	15	7,04
Middle Manager	32	15,02
Professional Employee	129	60,56
Senior Manager	13	6,1
Years of Working in the Company	Frequency (N=213)	%
< 1	58	27,23
1-5	116	54,46
5-10	25	11,74
10-15	14	6,57

Total Years of Work	Frequency (N=213)	%
< 1	24	11,27
1-5	85	39,91
5-10	43	20,19
10-15	32	15,02
> 15	29	13,62
Company Size	Frequency (N=213)	%
1-5	14	6,57
5-9	32	15,02
10-49	40	18,78
50-249	39	18,31
> 250	120	56,34
Company Sector	Frequency (N=213)	%
Banking/Finance	13	6,1
Service	47	22,07
Retail	9	4,23
Industry	28	13,15
Trade	13	6,1
Transportation	7	3,29
Software or IT Solutions	84	39,44

The participants were 33.8% female and 66.2% male. Most were aged 25–34 (52.28%), followed by under 24 (22.07%) and 35–44 (16.43%). Regarding education, 72.77% held a bachelor's, 13.62% a master's, and 11.27% an associate degree. In organizational roles, 60.56% were professional staff and 15.02% mid-level managers. Tenure showed 54.46% with 1–5 years, 27.23% less than one year, and 11.74% with 5–10 years. For total work experience, 39.91% had 1–5 years, 20.19% had 5–10 years, and 15.02% had 10–15 years. By company size, 56.34% worked in firms with 250+ employees, 18.78% in firms with 10–49 employees, and 18.31% in firms with 50–249 employees. Sectoral distribution showed 39.44% in software/IT, 22.07% in services, and 13% in industry.

Table 3. Variance Values of Questions

Question	Variance	Question	Variance
Q1	0,637	Q11	0,597
Q2	0,749	Q12	0,572
Q3	0,663	Q13	0,716
Q4	0,806	Q14	0,793
Q5	0,588	Q15	0,673
Q6	0,623	Q16	0,842
Q7	0,567	Q17	0,895
Q8	0,562	Q18	0,826
Q9	0,593	Q19	0,862
Q10	0,619	Q20	0,862

The variance values for each question are shown in Table 3.

Validity and Reliability Analyses

Study validity was assessed with the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity, and reliability with Cronbach's alpha coefficient.

Validity

Construct validity was assessed using exploratory factor analysis with principal components analysis. KMO values were 0.917, 0.873, and 0.712 for Performance Expectancy, Effort Expectancy, and Facilitating Conditions & Social Influence, indicating adequacy, and Bartlett's test was significant ($p < 0.01$), confirming factor analysis suitability.

Table 4. KMO and Bartlett's Tests Analysis

		Performance Expectancy	Effort Expectancy	Facilitating Conditions	Social Influence
KMO	Measure of Sampling Adequacy	0,917	0,873	0,689	0,872
Bartlett's	Chi-square	1206,665	854,612	228,799	846,013
of Sphericity	Df	21	10	3	10
	Sig.	0,000	0,000	0,000	0,000

Reliability

The Cronbach's alpha coefficient is a commonly used metric for evaluating the reliability and internal consistency of measurement scales (Alpar, 2020). According to correlation coefficient interpretation guidelines, the relationships between variables are classified as low (0–0.29), moderate (0.30–0.64), strong (0.65–0.84), and very strong (0.85–1.00). (Ural and Kılıç, 2021). Using Cronbach's Alpha (σ_x^2) (Cohen, 1988) is a way to examine reliability using the following equation:

$$\rho_T = \frac{k}{k-1} \left(1 - \frac{\sum_{i=1}^k \sigma_i^2}{\sigma_x^2} \right) \quad (1)$$

Here, k represents the number of questions using the Likert scale (20 questions in the survey). For each question, variances were calculated as listed in Table 2. Then, the sum of the variances called σ_x^2 was calculated as 14.0531. Cronbach's α was calculated for all factors using Equation (1).

The reliability analysis of the scales used in the study is illustrated in Table 5.

Table 5. Cronbach Alpha values of factors

Factor	Cronbach's Alpha	Number of Questions
Performance Expectancy	0,938	7
Effort Expectancy	0,927	5
Facilitating Conditions	0,813	3
Social Influence	0,926	5

The minimum acceptable threshold for Cronbach's Alpha reliability coefficient is generally considered to be 0.81. The Performance Expectancy scale demonstrated a Cronbach's alpha of 0.938, reflecting excellent internal consistency and high reliability. Furthermore, across all individual items, Cronbach's alpha values ranged from 0.81 to 1.00, indicating that the scale items exhibit consistently high reliability.

Table 6. The Mean, standart deviation, skewness and kurtosis values of each questions for the study.

Variable	Item	Mean	SD	Skewness	Kurtosis
Performance Expectancy	Q1	4,281	0,798	-1,272	5,188
	Q2	4,122	0,865	-1,112	4,510
	Q3	4,220	0,814	-1,158	4,763
	Q4	4,098	0,897	-1,095	4,382
	Q5	4,300	0,767	-1,322	5,724
	Q6	4,234	0,789	-1,131	4,898
	Q7	4,201	0,753	-0,747	3,322
Effort Expectancy	Q8	4,178	0,749	-0,773	3,900
	Q9	4,140	0,770	-0,742	3,707
	Q10	4,089	0,786	-0,681	3,506
	Q11	4,173	0,772	-0,984	4,741
	Q12	4,112	0,756	-0,779	4,037
Facilitating Conditions	Q13	4	0,846	-0,700	3,503
	Q14	3,938	0,890	-0,763	3,563
	Q15	4,032	0,820	-0,727	3,733
Social Influence	Q16	3,826	0,917	-0,641	3,177
	Q17	3,751	0,946	-0,759	3,667
	Q18	3,755	0,909	-0,669	3,386
	Q19	3,760	0,928	-0,713	3,466
	Q20	3,7417	0,928	-0,707	3,437

Table 6 reports the mean, standard deviation, skewness, and kurtosis values. Skewness (-0.641 to -1.322) and kurtosis (3.177 to 5.188) fall within acceptable limits (Kline, 2023), confirming normal

distribution. Item means ranged from 3.386 to 4.300 with standard deviations between 0.637 and 0.946, indicating favorable attitudes and low variability. Participants particularly agreed that Generative AI enhances performance (Q5: M = 4.30, SD = 0.897) and is easy to adopt (Q8: M = 4.18, SD = 0.80).

Correlation Analysis

Before hypothesis testing, Pearson correlation analysis was conducted to examine relationships among study dimensions (Table 7).

Table 7. Correlation analysis

	Performance Expectancy	Effort Expectancy	Facilitating Conditions	Social Influence
Performance Expectancy	1	0,630	0,520	0,535
Effort Expectancy	0,630	1	0,623	0,428
Facilitating Conditions	0,520	0,623	1	0,506
Social Influence	0,535	0,428	0,506	1

Correlation analysis showed significant positive relationships among the scales ($p < 0.05$). Performance Expectancy strongly correlated with Effort Expectancy ($r = 0.630$) and moderately with Facilitating Conditions ($r = 0.520$) and Social Influence ($r = 0.535$). Effort Expectancy correlated with Facilitating Conditions ($r = 0.623$) and Social Influence ($r = 0.428$), while Facilitating Conditions and Social Influence also correlated ($r = 0.506$), indicating interrelated perceptions.

Regression Analysis

A multivariate regression examined the causal relationships and the effects of independent variables—Digital Processes, Desire to Use Artificial Intelligence, and Artificial Intelligence Usage—on dependent variables: Performance Expectancy, Effort Expectancy, and Facilitating Conditions and Social Influence. Stepwise regression retained only independent variables with a statistically significant influence on performance expectancy.

Digital technology use in firms was coded as 1 for 'yes' and 0 for 'no'. Results showed ChatGPT had a significant positive effect on all four GenAI

dependent variables (Table 8), suggesting it is the most impactful technology. Other technologies—CRM, ERP, and HR software—were non-significant ($p > 0.05$).

Table 8. The Relationship between ChatGPT Usage and performance expectancy

Performance Expectancy	Beta	Sig.
ChatGPT	0,21	0,0039
Adj. R2	0,09460924	
N	213	
F	2,110	
Sig.	0,0039	
Durbin-Watson	1,894	
Standard Error	0,077	

The results in Table 8 were obtained in a single step using the stepwise method in the Multivariate Regression Analysis. All digital processes except ChatGPT were found to have no significant effect on the Performance Expectancy factor ($p > 0.05$). Thus, these variables were not included in the model. ChatGPT use, however, has a significant and positive effect on Performance Expectancy. Therefore, it can be argued that employees' performance will improve as their ChatGPT use increases. The extent of this variable's impact can be decided by looking at the R2 value. The R2 value is 0.094, or 9.4%. ChatGPT use explains 9.4% of performance expectancy. This is a very low percentage. Based on this, it can be concluded that ChatGPT use has a negligible effect on performance expectancy.

Table 9. The Relationship between ChatGPT Usage and Effort Expectancy

Effort Expectancy	Beta	Sig.
ChatGPT	0,199	0,0057
Adj. R2	0,10282900	
N	213	
F	2,315	
Sig.	0,00572130	
Durbin-Watson	2,120	
Standard Error	0,071	

Table 9 shows that only ChatGPT use had a significant positive effect on Effort Expectancy ($p > 0.05$), while other digital processes were non-significant and excluded from the model. The R2 value is 0.10, indicating that ChatGPT explains 10% of the variance, suggesting a modest and not decisive effect on Effort Expectancy.

Table 10. The Relationship between ChatGPT Usage and Facilitating Conditions

Facilitating Conditions	Beta	Sig.
ChatGPT	0,28	0,000098
Adj. R2	0,13033602	
N	213	
F	3,0274	
Sig.	0,000098	
Durbin-Watson	2,0848	
Standard Error	0,0704	

Table 10 shows a significant positive relationship between ChatGPT use and Facilitating Conditions ($p < 0.05$), indicating that higher usage improves perceptions of supportive resources. The model's $R^2 = 0.13$, showing a modest effect, suggesting other contextual and organizational factors also influence this dimension.

Table 11. The Relationship between ChatGPT and ERP Usage with Social Pressure

Social Pressure	Beta	Sig.
ChatGPT	0.1995	0,001798735
ERP	0,1336	0,03063285
Adj. R2	0,192881176	
N	213	
F	1,9236	
Durbin-Watson	2,110	
Standard Error	0,0722	

Table 11 shows ChatGPT and ERP have significant positive effects on Social Influence ($p < 0.05$), indicating increased usage enhances perceived social pressure. The model's $R^2 = 0.19$, suggesting a modest impact and that other factors likely contribute.

Table 12. The Relationship between artificial intelligence use request and performance expectancy

Performance Expectancy	Beta	Sig.
Request for Artificial Intelligence Use	0.065	0.0003
Adj. R2	0.058	
N	213	
F	13,16	
Sig.	0.0003	
Durbin-Watson	1,916	
Standard Error	0.01807	

In stepwise multivariate regression (Table 12), digital processes and AI usage were non-significant ($p > 0.05$) and excluded. AI Usage Desire had

a significant positive effect on Performance Expectancy, with adjusted $R^2 = 0.058$, explaining 5.8% of its variance, indicating a weak effect.

Table 13. The Relationship between artificial intelligence use and effort expectancy

Effort Expectancy	Beta	Sig.
Artificial Intelligence Use	0,070	0,0009
Adj. R2	0,050	
N	213	
F	11,186	
Sig.	0,0009	
Durbin-Watson	2,110	
Standard Error	0,021	

Table 13 shows that Digital Processes and AI Usage Desire were non-significant ($p > 0.05$) and excluded. AI Usage had a significant positive effect on Effort Expectancy, with adjusted $R^2 = 0.050$, explaining about 5% of its variance, indicating a modest effect.

Table 14. The Relationship between artificial intelligence use and effort expectancy

Facilitating Conditions	Beta	Sig.
Artificial Intelligence Use	0,086	0,00016
Adj. R2	0,0652	
N	213	
F	14,717	
Sig.	0,00016	
Durbin-Watson	2,101	
Standard Error	0,022	

Table 14 shows Digital Processes and AI Usage Desire were non-significant ($p > 0.05$) and excluded. AI Usage positively affected Facilitation, with adjusted $R^2 = 0.065$, explaining 6.5% of the variance, indicating a negligible effect.

Table 15. Relationship between artificial intelligence use and social pressure

Social Pressure	Beta	Sig.
Artificial Intelligence Use	0,071	0.00696
Request for Artificial Intelligence Use		0.02231
Adj. R2	0,077	
N	213	
F	8,882	
Sig.	0,022	
Durbin-Watson	2,091	
Standard Error	0,026	

Table 15 shows Digital Processes and AI Usage Desire were non-significant ($p > 0.05$) and excluded. AI Usage positively affected Facilitating Conditions, with adjusted $R^2 = 0.065$, explaining 6.5% of the variance, indicating a weak effect.

The acceptance or rejection of the hypotheses based on the analysis results is summarized in Table 16.

Table 16. Hypothesis testing results

Hypothesis	Result
H1: There is a significant relationship between Digital Processes and Performance Expectancy.	Rejected
H2: There is a significant relationship between Artificial Intelligence Usage Desire and Performance Expectancy.	Accepted
H3: There is a significant relationship between Artificial Intelligence Usage and Performance Expectancy	Rejected
H4: There is a significant relationship between Digital Processes and Effort Expectancy.	Rejected
H5: There is a significant relationship between Artificial Intelligence Usage Desire and Effort Expectancy.	Rejected
H6: There is a significant relationship between Artificial Intelligence Usage and Effort Expectancy.	Accepted
H7: There is a significant relationship between Digital Processes and Facilitating Conditions.	Rejected
H8: There is a significant relationship between Artificial Intelligence Usage Desire and Facilitating Conditions.	Rejected
H9: There is a significant relationship between Artificial Intelligence Usage and Facilitating Conditions.	Accepted
H10: There is a significant relationship between Digital Processes and Social Influence.	Rejected
H11: There is a significant relationship between Artificial Intelligence Usage Desire and Social Influence.	Accepted
H12: There is a significant relationship between Artificial Intelligence Usage and Social Influence.	Accepted

Conclusion

During early digital transformation, many companies began integrating GenAI to enhance strategic planning and decision-making. However, research on GenAI's impact on consumer-oriented business practices is limited. As GenAI develops, it is expected to improve organizational performance and workflows, making it crucial to understand employee attitudes and decision-making tendencies prior to implementation.

This study analyzed digital technology use, existing AI adoption, and employee demand for AI in 213 Turkish firms across four dimensions: performance expectancy, effort expectancy, facilitating conditions, and social influence. Results indicate that tools like RPA, CRM, and Inventory Tracking Automation had no significant effect on GenAI adoption dimensions, except ChatGPT, which showed a consistent positive impact. ERP affected only social influence. AI-specific tools, such as chatbots, recommendation systems, and analytics, positively influenced effort expectancy, facilitating conditions, and social influence, while employees' desire to use AI increased performance expectancy and social influence.

The study highlights that the number of digital tools alone does not ensure GenAI readiness; digital maturity, integration, usage intensity, and process efficiency, along with employee attitudes, are key factors. Limitations include sample concentration in IT and large firms, non-probability sampling, simplified process measures, and low model explanatory power.

Discussion and Limitations

Although the results of this study offer valuable insights, some limitations should be considered, particularly regarding the generalizability of the results, sample limitations, variable measurement methods, low R^2 values, and the ineffectiveness of digital processes. A large proportion of participants were from the IT sector (39.44%) and large enterprises (56.34%), limiting the generalizability of the findings to other industries and smaller firms. Low participation from SMEs and less digitally advanced sectors may underrepresent sector-specific challenges and GenAI adoption potential. Adoption patterns of digital technologies and AI can vary by industry and firm size (Vargo & Lusch, 2017; Yoo, Henfridsson, & Lyytinen, 2010), highlighting the need for sectoral diversity. Despite non-significant ANOVA results across sectors or firm sizes, skewed sample distribution calls for cautious interpretation.

The study's sample was collected via snowball, convenience, and simple random sampling, with overrepresentation of IT and large enterprises,

which may introduce selection bias (Biernacki & Waldorf, 1981; Patton, 2014). Future research should use more comprehensive digital maturity models and representative samples, assessing not only the number of technologies but also integration depth, usage intensity, effectiveness, and process efficiency.

Although the gender distribution of participants in this study is imbalanced (66.2% male, 33.8% female), independent sample t-tests indicated that there were no statistically significant differences in GenAI-related perceptions or usage between male and female respondents. Therefore, gender was not included as a control variable in the regression analyses. Moreover, the unit of analysis in this study focuses primarily on firm-level GenAI usage rather than individual-level preferences, as responses reflect the use and adoption of GenAI tools within organizations. While gender-based behavioral differences may exist in broader technology adoption contexts, the current findings suggest that in the organizational setting of this study, gender did not exert a meaningful influence. Nonetheless, future research with more balanced samples could explore potential moderating effects of gender in greater detail.

The study primarily used snowball sampling, suitable for hard-to-reach populations or when population information is limited (Patton, 2014). While effective, this method can introduce bias and homogenization (Biernacki & Waldorf, 1981). To reduce these limitations and enhance diversity, participants were also recruited via convenience and simple random sampling, improving the study's reliability and validity.

A key limitation of this study is that "Digital Processes," "AI Use," and "AI Use Intention" were measured using simple counts or binary coding, which do not capture the depth, frequency, integration, or strategic importance of technology adoption. This limits the explanatory power of the findings. Future research should use multidimensional measures—such as composite indices of usage, integration, user satisfaction, and impact—and qualitative methods like interviews or case studies to better assess AI adoption and sectoral

differences. Likert-type scales can also capture variations in AI usage desire across organizational contexts.

The adjusted R^2 values obtained from the regression models examining the relationships between AI usage, AI adoption intention, and GenAI usage are relatively low (Performance Expectancy: 0.058; Effort Expectancy: 0.050; Facilitating Conditions: 0.065; Social Influence: 0.077). Similarly, the adjusted R^2 values from the regression model that used Digital Technology adoption as a binary variable (present=1, absent=0) are also low (Performance Expectancy: 0.095; Effort Expectancy: 0.103; Facilitating Conditions: 0.130; Social Influence: 0.193). The relatively low adjusted R^2 values observed in the regression models highlight the limited explanatory power of the current set of independent variables in accounting for variations in Generative AI (GenAI) adoption. This finding suggests that the acceptance and integration of GenAI technologies are likely influenced by a broader and more complex array of organizational, cultural, and individual factors that were not captured in this study. Previous research has emphasized the potential roles of trust in AI systems (Gefen et al., 2003), perceived risk (Featherman & Pavlou, 2003), top management support (Ifinedo, 2011), organizational culture (Cameron, 2011), financial resources, and training availability as critical enablers or inhibitors of AI-related transformations. The absence of such variables in the present model may partly explain the modest variance explained and warrants further investigation. Perhaps even more striking is the finding that digital process usage—operationalized through the presence of tools such as ERP, CRM, RPA, and inventory tracking systems—did not have a statistically significant effect on any of the GenAI acceptance dimensions (performance expectancy, effort expectancy, facilitating conditions, or social influence). This challenges the commonly held assumption that digitally mature firms are inherently more prepared to integrate generative AI technologies. Instead, the findings indicate that mere digital tool adoption does not automatically translate into GenAI readiness. Several possible explanations can be considered in interpreting this outcome. First, the measurement

method employed—counting the number of digital tools in use—may lack the sensitivity to capture meaningful differences in digital maturity or strategic alignment. Secondly, this research did not evaluate the depth or maturity of digital system implementation (for instance, the distinction between basic ERP usage and the integration of advanced analytics), which may conceal subtle variations in technological readiness. Moreover, the distinctive attributes of Generative AI—such as its cognitive, creative, and semi-autonomous capabilities—could present adoption challenges that diverge significantly from those experienced in traditional digitalization initiatives. Furthermore, the adoption of GenAI may be more significantly impacted by contextual hurdles like internal resistance to change, a lack of technical expertise, or ethical considerations than by the availability of digital processes alone. These revelations emphasize the significance of institutional, cultural, and human factors in assessing technology readiness and urge a reexamination of simplistic presumptions on digital transformation. To ensure a more complex, multifaceted view of AI adoption, future studies should look more closely at these factors. Although the adjusted R^2 values were relatively low, this outcome is not uncommon in social science research, particularly when studying complex organizational behaviors. The modest explanatory power indicates that additional contextual and organizational factors—such as leadership support, digital literacy, or cultural readiness—likely play a role in GenAI adoption. Importantly, the results still carry practical significance: the consistent positive effect of ChatGPT adoption across all GenAI dimensions highlights that even small but significant predictors can yield actionable insights for organizations. Thus, while the statistical models explain only a limited portion of variance, the findings remain relevant for managerial practice, especially in guiding digital transformation strategies and workforce training initiatives.

Within the context of the tested model, the rejection of hypotheses H1, H4, H7, and H10, alongside the finding that digital processes exert no statistically significant influence on factors associated with GenAI, stands out as one of the most noteworthy outcomes of this research. This finding shows

that the presence of digital infrastructure or technological assets within the firms does not automatically lead to the adoption or effective use of the GenAI. It emphasizes that digital transformation extends beyond the acquisition of technologies and contains more complex dimensions such as effective use, organizational adaptation and cultural change. There are several possible reasons for these findings. First, in this study, the measurement of digital processes used a completely quantitative approach based on the number of digital technologies used and yes/no option. This approach could not achieve critical qualitative aspects such as digital maturity, depth of integration into basic business operations and general contribution of these technologies to performance results. Consequently, measurement may not fully reflect the real effectiveness or maturity of the digital capabilities of the companies. Another reason is that it does not mediate or control organizational factors that may affect the relationship between digital processes and GenAI adoption. These include management support, strategic vision, employee participation and training initiatives. For example, the lack of operating digital literacy or resistance to change may prevent the translation of digital infrastructure into GenAI adoption.

More thorough and multifaceted digital maturity models that incorporate both quantitative and qualitative markers, such as technology intensity, process alignment, user readiness, and strategy harmony, are advocated for use in future research. Research should also look into possible indirect routes, such as the function of organizational skills, worker satisfaction, or process optimization as a middleman. Conversely, barriers including employee reluctance, perceived risk, organizational inertia, and a lack of management support may limit the transformative potential of digital processes (Bharadwaj et al., 2013; Chen et al., 2014). Therefore, to accurately assess how digitization has shaped AI orbits, a more nuanced and integrative framework will be required. In the regression analysis, the use of digital technologies such as CRM, ERP, and Human Resources Software was coded as 'yes' 1 and 'no' 0. The results show that only the use of ChatGPT had a statistically significant and positive effect on all GenAI factors. This

outcome highlights ChatGPT as the most prominent and impactful digital tool among those evaluated, as perceived by users. In contrast, other technologies—such as CRM, ERP, and human resources software—did not exhibit statistically significant effects ($p > 0.05$), suggesting that their influence on the dependent variables is negligible.

Similarly, AI applications used in companies have been evaluated solely based on their type and number of uses, without considering the frequency, level of integration, or success of these applications. Therefore, to more accurately analyze the impact of AI applications on performance, it is recommended that future studies collect data on usage intensity and perceived success.

Moreover, responses to the question "In which areas would you like to utilize AI?" were recorded numerically, without measuring the degree of desire (e.g., using a 5-point Likert scale). This approach provides limited insight into the nature of the demand for AI. Future studies would benefit from using scaled measurements that capture the intensity of participants' preferences, thus enabling a more nuanced understanding of companies' intentions regarding AI adoption.

The results reveal that while actual AI use has a large and positive impact on Effort Expectancy, Facilitating Conditions, and Social Influence, intention to use AI has a significant and positive impact on both Performance Expectancy and Social Influence. Hypotheses H2, H6, H9, H11, and H12 are so validated. These findings demonstrate how crucial user willingness and favorable opinions are in promoting the usage of generative artificial intelligence (GenAI). Perceived utility and preparedness to engage with a technology influence adoption behavior, according to existing research on technology acceptance frameworks (Venkatesh, Thong, & Xu, 2016). According to Williams, Rana, and Dwivedi (2015), social influence has a substantial predictive potential based on environmental forces and established norms.

Positive user attitudes and enthusiasm can hasten the adoption of new and difficult technologies, especially ones like artificial intelligence, according to recent research (Dwivedi et al., 2021). In this regard, businesses could adopt tactics to boost user

motivation in addition to their technology investments. The establishment of peer support groups, awareness campaigns, and focused educational programs are a few examples of such actions.

Businesses should adopt a situation-specific approach to digital transformation and AI integration. AI literacy and human-centered design are crucial across all firm sizes (Lu, Papagiannidis, & Alamanos, 2021), but strategies should be tailored to industry and organizational capabilities. While large tech-focused companies invest heavily in AI and infrastructure, smaller firms may require training and change management for effective adoption (Kane et al., 2019). Collaborative human-machine interfaces can further enhance synergy between employees and intelligent systems (Shin, 2022).

The study also indicates that an organization's readiness to adopt GenAI is not strongly determined by existing digital processes. The low explanatory power of statistical models suggests that organizational, human, and contextual factors play a significant role in GenAI adoption, highlighting the need for a broader understanding of AI preparedness beyond digital infrastructure.

Recommendations for Future Research

Future studies should use more representative samples across industries and firm sizes, including SMEs and underrepresented sectors like manufacturing, retail, and healthcare, to better capture GenAI integration across digital maturity levels. Research should focus on the depth, integration, and effectiveness of digital technologies rather than tool counts, using digital maturity models to assess strategic alignment, data readiness, process automation, and innovation culture. Additional variables—such as trust in AI, perceived risk, top management support, organizational culture, digital literacy, regulatory environment, and resource availability—should be considered, as they may mediate or moderate GenAI adoption. Including demographic controls like gender, age, education, and job role could enhance analyses of individual attitudes and behavioral intentions. Longitudinal and qualitative approaches, including interviews

and case studies, can better capture evolving adoption dynamics, organizational challenges, and employee interactions with GenAI, particularly in collaborative AI environments. Considering institutional, cultural, and technological factors would further improve model robustness and provide practical guidance for organizations.

Declarations

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RESEARCH ARTICLE

The Perception of Employees About the Digital Transformation of Türk Telekom Company

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Abstract

This study examines the perception of Türk Telekom employees about the company's digital transformation based on human resources, technology, infrastructure, suppliers, users, and management parameters. Sub-parameters such as artificial intelligence, blockchain, IoT (Internet of Things), virtual/augmented reality, cryptocurrency, digital twin, machine learning, robotic systems, voice assistant systems, cybersecurity, big data, system integration, and cloud computing are also discussed within these main parameters. The research aims to assess the perception of digital transformation parameters in the telecommunications sector, using Türk Telekom as a case study. Findings suggest that system integration, big data, cybersecurity, and IoT are the most well-known digital transformation parameters, while digital twin technology emerged as the least familiar one. Türk Telekom employees also demonstrate only moderate awareness of key digital transformation components. In addition to training and workshop programs on digital transformation, it is suggested that enabling employees to observe the impacts of the digital transformation on tangible outcomes of their work, such as products or services, may serve as a motivational factor that enhances job performance.

Keywords: telecommunication, Türk Telekom, digital transformation, artificial intelligence, blockchain

Öz

Bu çalışmada, Türk Telekom çalışanlarının şirketin dijital dönüşümüne ilişkin algısı insan kaynakları, teknoloji, altyapı, tedarikçiler, kullanıcılar ve yönetim parametreleri temelinde incelenmiştir. Yapay zekâ, blok zinciri, IoT (nesnelerin interneti), sanal/artırılmış gerçeklik, kripto para, dijital ikiz, makine öğrenmesi, robotik sistemler, sesli asistan sistemleri, siber güvenlik, büyük veri, sistem entegrasyonu ve bulut bilişim gibi alt parametreler de bu ana parametreler kapsamında ele alınmıştır. Araştırma, Türk Telekom'u bir vaka çalışması olarak kullanarak telekomünikasyon sektöründe dijital dönüşüm parametrelerinin algısını değerlendirmeyi amaçlamaktadır. Bulgular, sistem entegrasyonu, büyük veri, siber güvenlik ve IoT'nin en bilinen dijital dönüşüm parametreleri olduğunu, dijital ikiz teknolojisinin ise en az bilinen teknoloji olarak ortaya çıktığını göstermektedir. Türk Telekom çalışanları ayrıca temel dijital dönüşüm bileşenlerine ilişkin yalnızca orta düzeyde farkındalık göstermektedir. Dijital dönüşüm konusunda eğitim ve atölye programlarına ek olarak, çalışanların dijital dönüşümün yürütmekte oldukları çalışmalara yönelik somut olumlu çıktıları üzerindeki etkilerini gözlemlenmelerini sağlamanın, iş performansını artıran bir motivasyon faktörü olarak hizmet edebileceği önerilmektedir.

Anahtar Kelimeler: Telekomünikasyon, Türk Telekom, dijital dönüşüm, yapay zeka, blokzincir

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Introduction

Human history has undergone various transformations—sociological, psychological, economic, cultural, and technologically driven by innovation, reform, war, and pandemics. In the 21st century, technology is one of the most significant areas of transformation. We are living in a new technological age, which has changed our daily routines, including the communication tools we use. As technology rapidly advances, these transformations have become inevitable. Since the early 21st century, these processes have been collectively termed *digital transformation*.

Digital transformation denotes the systematic adoption and integration of digital technologies within organizations, aimed at innovating or optimizing products, services, and operational processes through the digitization of traditional business workflows. It involves not only the implementation of technologies such as artificial intelligence (AI), the Internet of Things (IoT), big data analytics, robotics, and machine learning, but also a fundamental shift in organizational culture, strategy, and value creation models. Rather than being a purely technological shift, digital transformation represents a multidimensional change process that affects internal operations, customer engagement, decision-making processes, and competitive positioning. As such, it is increasingly viewed as a strategic imperative across industries, enabling organizations to enhance efficiency, agility, and resilience in the face of rapid technological and market changes (Mirzagayeva and Aslanov, 2022).

In the telecommunications sector, digital transformation has been extensively studied by researchers, who examine how companies leverage new technologies to enhance efficiency, improve customer experience, and increase revenue. Smith & Brown (2021), in their study, highlight that technologies such as cloud computing, AI, 5G, and IoT are reshaping service delivery and network management. AI-driven automation, in particular, optimizes network performance by improving predictive maintenance processes (Lee et al., 2020). Ellström et al. (2021), in their study on identifying dynamic capabilities for digital transformation in Sweden, emphasize that firms must clearly define adaptable digital transformation strategies, focus

on core competencies, and prioritize sustainability. Customer-centric digitalization has also emerged as a critical research area. García & Liu (2022) indicate that data analytics and machine learning help telecommunication companies personalize services and anticipate customer needs, thereby increasing customer loyalty.

Additionally, blockchain technology has been explored for secure transactions and fraud prevention (Rahman & Singh, 2021). Despite the operational efficiency and new revenue streams of digital transformation, challenges such as high implementation costs, cybersecurity risks, and regulatory barriers persist (Patel et al., 2023). Williams (2022) also stresses that technology adoption must strategically align business objectives. Klein (2020) also explores the leadership dimension of digital transformation, highlighting the need for leaders to organize both their companies and transformation processes effectively.

Digital transformation has recently gained significant attention in Türkiye, with numerous researchers exploring its various dimensions. While some focus on digital transformation in the public sector (Hisoğlu-Koç, 2020; Göçoğlu, 2020), others investigate its impact on corporate branding and marketing (Yılmaz-Altuntaş, 2018; Koçak, 2019). Yankın (2019) examines digital transformation in the workplace, analyzing its social, economic, and demographic effects. Nuroğlu and Nuroğlu (2018) compare the digital transformation roadmaps of Germany and Türkiye in the industrial sector, noting that emerging challenges cannot be resolved immediately and emphasizing the importance of close collaboration with technology-producing firms. In telecommunications, Özkaya (2018) investigates the operational dynamics of digital transformation, focusing on differences between traditional and new business processes and their market impact. Gözükcük (2020) analyzes the relationship between digital transformation and economic growth, demonstrating that advancements in digital transformation parameters positively contribute to Gross Domestic Product (GDP). Yavuz (2019) examines blockchain technology and its applications within the context of economic digital transformation.

Previous studies reveal that digital transformation in the telecommunications sector has been

explored from multiple perspectives, but research incorporating perceptual measurements remains very limited. This study addresses this important gap by assessing telecommunications employees' perceptions of digital transformation parameters, specifically within Türk Telekom Company. It is also aimed that the findings and the recommendations of this study provide insights for other telecommunication companies about setting their future digital transformation strategies and policy-makers to enhance their digital visions.

Following the introduction, the second section of the study addresses the theoretical framework of digital transformation, differentiating between *digitization*, *digitalization*, and *digital transformation*. It also outlines sector-specific digital transformation parameters, focusing on telecommunications. Subsequently, the telecommunications sector is detailed, incorporating global and Turkish industry developments. The study also provides an overview of Türk Telekom, including its digital transformation initiatives and case applications. The methodology, data collection, and research framework are then presented, followed by an analysis of survey findings. The concluding section summarizes key findings and offers recommendations for the Türk Telekom Company and the telecommunications sector in general.

Digital Transformation in the Telecommunication Industry

In the 21st century, *digital transformation*, *digitalization*, and *digitization* have become increasingly important terms. Following the Industrial Revolution in the late 17th century, technological inventions advanced rapidly, gaining momentum in the 20th century and beyond. In the modern era, the management, control, and widespread dissemination of large-scale data have been made possible through technological advancements and the internet (Karagözoğlu-Aslıyüksek, 2016: 89). The shift from analog to digital processes has played a pivotal role in driving technological progress. The application of digitization to business and social life has given rise to digitalization, paving the way for broader digital transformation.

Today, most technologies referred to as *digital technologies* are widely used in economic and social life. While the unit costs of digital technologies have decreased in recent years, their overall utility has increased, leading to higher adoption and usage rates across society. The development of these technologies has accelerated and enhanced their added value (BSTB, 2018: 24). Although technological advancement is a key driver of digital transformation, the process should not be evaluated merely by the development and adoption of digital technologies. Digital transformation encompasses an integrated process in which all stakeholders, including industries, employees, educational institutions, and public agencies, undergo structural changes, resulting in new operational models and workflows.

Digital transformation technologies can be classified in various ways. According to the roadmap developed by TÜBİTAK (Scientific and Technological Research Council of Türkiye), digital technologies are grouped into three categories: *digitization*, *interaction*, and *factories of the future* (BSTB, 2018: 24). Virtualization, cybersecurity, big data, and cloud computing fall under digitization, while the Internet of Things (IoT) and sensor technologies are classified under interaction. Robotics, additive manufacturing, automation, and control systems are categorized as factories of the future.

The Telecommunications Sector

The telecommunications sector comprises companies that enable global communication through telephone, computer, and web-based network technologies. These firms build infrastructure that facilitates data transmission across the world. Key players include wireless service providers, satellite companies, cable operators, and internet service providers. For all industries worldwide, advancing technological infrastructure and ensuring high customer satisfaction are essential for maintaining competitiveness. In the telecommunications sector, the development of technology and supporting infrastructure is critical, as the quality and reliability of services directly impact users' daily lives and social interactions (KPMG Türkiye, 2018, p.4).

The Coronavirus Disease (COVID-19) pandemic in 2020, particularly due to lockdowns and reduced social interaction, accelerated digital transformation across all sectors. The telecommunications sector, however, adjusted more smoothly than many others, proving resilient and even advancing further throughout the pandemic (Beybur & Çetinkaya, 2020, p.148).

The shift to remote work and online education highlighted the need for robust technological infrastructure and uninterrupted internet access, significantly increasing demand for telecom services. During the pandemic, global data traffic increased by as much as 74% as a result of isolation measures. Unlike many industries that experienced setbacks in investment and growth, communication technologies rose in strategic significance (KPMG Türkiye, 2020, p.3).

As of 2021, out of the world's 7.5 billion people, 5.3 billion own mobile phones, and over 4.6 billion are active internet users. Social media platforms have 3.9 billion registered users (Webrazzi, 2021), underscoring the telecommunications sector's massive scale.

The Telecommunications Sector in Türkiye

The history of Türkiye's telecommunications sector dates back to the Ottoman Empire, with the establishment of the *Postahane-i Amire* (Imperial Post Office) under Sultan Abdülmecid in the 1840s. The Telegraph Ministry was founded in 1855, and by 1871, it merged with the postal service to form the *Posta ve Telgraf Nezareti* (Ministry of Post and Telegraph) (Nolto Telecommunications, 2020). Mirroring global trends, Türkiye's telecommunications sector evolved gradually until the 2000s, when growth accelerated.

Today, Türkiye's communications sector holds significant potential, with companies leveraging advanced technologies and corporate structures to drive expansion. The industry can be categorized into mobile, fixed-line, broadband, and other services.

Mobile Market

As of December 2024, Türkiye has 94,321,270 mobile subscribers, representing a 110.11% penetration rate. Following the launch of 3G in July 2009, the number of subscribers reached nearly 66 million by March 2016. The launch of 4.5G in April 2016 prompted a rapid transition from 3G, with 4.5G users reaching 87,662,175 by December 2024, while 3G subscribers declined to 4,345,095 (BTK, 2024, p.59).

Table 1 compares 2G, 3G, and 4.5G subscriber numbers over the years.

Table 1. Number of Mobile Subscribers

Number of Mobile Subscribers (Millions)			
Year	2G	3G	4,5
2009	55,7	7,1	0
2011	33,9	31,4	0
2013	20,4	49,3	0
2015	9,4	64,3	0
2016	4,5	18,9	51,7
2018	2,1	6,6	71,3
2019	1,8	4,8	74,2
2021	2,0	4,2	80,2
2023	2,3	5,0	84,9
2024	2,3	4,3	87,7

Source: BTK, 2024

After the introduction of 3G and 4.5G technologies, the number of mobile subscribers accessing internet services via mobile devices and cell phones has reached 75.9 million. In addition, the number of mobile subscribers accessing internet services exclusively via 4.5G from mobile computers and cell phones reached 69.1 million. In the fourth quarter of 2024, the total volume of mobile internet data usage was recorded as 3,744,694 TBytes, and the total mobile internet data usage by 4.5G users alone reached 3,617,599 TBytes (BTK, 2024:60).

Table 2. Mobile Operators in Türkiye

Mobile Operators in Türkiye			
Operators	Market Share	Traffic Volume	ARPU
TÜRK TELEKOM	29,3%	22,8 Milyar/Dk	39,2 TL
VODAFONE	34,8%	27,1 Milyar/Dk	42,4 TL
TURKCELL	35,9%	28,0 Milyar/Dk	47,1 TL

Source: BTK,2024

As of the fourth quarter of 2024, based on the number of subscribers of mobile operators, Turk-

cell holds a market share of 40.6%, followed by Vodafone (30.4%), and Türk Telekom Mobile (29%) respectively (BTK, 2024:65). As of the last quarter of 2024, the total mobile traffic volume reached 77.9 billion minutes, representing the peak level of traffic observed.

Landline Market

Türkiye has 9 million landline telephone subscribers, corresponding to a penetration rate of approximately 10.6%, as of the end of December 2024. Considering the average household size in Türkiye, the landline telephone services still cover a significant portion of the population (BTK, 2024, p. 35). Türk Telekom's average voice traffic, which was 444 million minutes in the fourth quarter of 2023, declined to 410 million minutes in the same quarter of 2024. Compared to the same period in 2020 and 2021, voice traffic has decreased by approximately 19% and declined by about 2.8% compared to the previous quarter (BTK, 2024, p. 39).

Table 3. Landline Operators in Türkiye

Landline Operators in Türkiye	
Operators	Market Share (%)
SUPERONLINE	49,8
VODOFONENET	22,3
TTNET	11,7
ESER TELEKOM	2,2
COMPATEL	1,6
NETGSM	1,6
ÖZTEK	0,9
OTHERS	9,8

Source: BTK,2024

Table 3 shows the market shares of TTNET, VodafoneNet, Superonline, and other companies in terms of subscriber numbers as of December 2024 (BTK, 2024:35).

Broadband Market

The number of broadband internet subscribers, which was 7 million in 2008, has almost reached 96.4 million by 2024. The expansion of fiber infrastructure expedited the growth of internet subscribers (BTK, 2024:49).

Table 4. Internet Providers in Türkiye

Internet Providers in Türkiye		
Companies	Subscribers (%)	Income (%)
TTNET	53,8	56,83
SUPERONLINE	15,23	13,04
VODAFONE NET	6,93	8,95
TURKSAT	6,89	3,14
TURKNET	5,82	6,97
MİLLENİCOM	1,94	2,1
OTHERS	9,4	8,97

Source: BTK,2024

As of December 2024, Türk Telekom TTNET, Turkcell Superonline, and Vodafone Net are the top three operators in terms of both the number of users receiving internet services and the market revenue share (BTK, 2024, p. 50). Moreover, 119 companies are regularly and continuously providing internet services (BTK, 2024, p. 51). Since the launch of mobile broadband services in July 2009, mobile internet subscribers have reached 75.9 million. The total mobile internet data volume has reached approximately 3.75 terabytes during the same period. In the fourth quarter of 2024, the total fixed broadband internet data volume, including cable internet services, was recorded as 16.9 million terabytes (BTK, 2024, p. 52).

Other Services

There are 14 authorized infrastructure operators in Türkiye. As of the end of 2024, the total fiber optic cable length deployed by various companies is approximately 605,000 kilometers. Türk Telekom alone accounts for around 400,000 kilometers, approximately 233,000 kilometers of which are allocated for backbone infrastructure, with the remainder designated for network distribution (BTK, 2024, p. 82).

Table 5. Satellite Communication Companies

The Number of Satellite Company Subscribers	
Companies	Subscribers (%)
ESER TELEKOM	43,5
TURKSAT	36,5
SUPERONLINE	8,3
İCT	5,4
İŞNET	5,1

Source: BTK,2024

Digital Transformation at Türk Telekom

Türk Telekom Company is one of the oldest and most well-known companies of Türkiye. With a history spanning 180 years, it is the country's first integrated telecommunications company. Its history dates back to 1840 with the establishment of the Post Directorate. Later, it continued under the PTT name until it was restructured as Türk Telekom A.Ş. in 1994. The company was privatized in 2005 and made its initial public offering (IPO) in 2008. In 2015, Türk Telekom entered the mobile communications sector by acquiring AVEA. In response to rapidly evolving communication and technological demands, Türk Telekom A.Ş., TT Mobil İletişim Hizmetleri A.Ş., and TTNET A.Ş. started providing integrated services in 2015, maintaining their legal entities and complying with relevant legislation and regulations. In January 2016, mobile, internet, telephone, and TV services merged under the single brand name, *Türk Telekom*.

Table 6. Türk Telekom Digital Transformation Parameters

DIGITAL TRANSFORMATION PARAMETERS	FIELDS OF ACTIVITY
HUMAN	Qualified Workforce – Human Resources Awareness – Digital Training Programs Artificial Intelligence Blockchain IoT (Internet of Things) Virtual/Augmented Reality (VR/AR)
TECHNOLOGY	Cryptocurrency Digital Twin Machine Learning Robotic Systems Voice Assistant Systems Cyber-Physical Systems
INFRASTRUCTURE	Cyber Security Big Data System Integration Cloud Computing Supporting local digital technology industry firms
SUPPLIERS	Enhancing capabilities in technology acquisition and development
USERS	Delivering digital transformation investments to end-users
MANAGEMENT	Institutionalizing digital transformation efforts, establishing relevant directorates and departments

As of March 31, 2021, Türk Telekom served 16.5 million fixed access lines, 13.7 million broadband users, 3.2 million TV subscribers, and 23.4 million

mobile subscribers. The Türk Telekom Group, aiming to introduce new technologies in Türkiye, has 34,963 employees in 81 provinces (Türk Telekom 2020 Annual Report, 2021, p.6).

In its roadmap for digital transformation of Türkiye, the Ministry of Industry and Technology of the Republic of Türkiye has categorized the digital transformation parameters under six categories (BSTB, 2018:118). As shown in Table 6, Türk Telekom's digital transformation activities are grouped under these six main parameters: *human resources, technology, infrastructure, suppliers, users, and management*.

Human at Türk Telekom

Türk Telekom aims to be the most human-centered and preferred company in the telecommunications sector, with a dynamic and innovative workforce. Emphasizing employees as its most valuable asset, the company integrates national digitalization strategies across its processes, especially through Human Resources (HR) practices. In 2020, Türk Telekom aligned all HR policies and systems with the human-centric principle, ensuring employees feel valued (Türk Telekom 2020 Annual Report, 2021, p.139).

During the COVID-19 pandemic, Türk Telekom maintained continuous development through the Türk Telekom Academy, providing interactive virtual training sessions to its employees. Modern online training methods in 2020 reflected the company's commitment to investing in human capital (Türk Telekom 2020 Annual Report, 2021, p.142).

Technology at Türk Telekom

With advanced physical infrastructure, diverse value-added services, and the ability to integrate technology swiftly, Türk Telekom ranks among the global leaders in big data and telecommunications. The company's digital transformation focuses on AI, blockchain, IoT, VR/AR, cryptocurrencies, digital twins, machine learning, robotics, and voice assistant systems (Türk Telekom 2020 Annual Report, 2021, p.135).

Artificial Intelligence (AI): Türk Telekom utilizes its proprietary AI solutions, such as the TT-ON

root cause analysis platform, to monitor dense wavelength-division multiplexing (DWDM) systems and fiber optic cable quality in real-time. This solution enhances automation and reduces manual operations, enabling staff to focus on higher-value tasks.

Blockchain: The company supports Blok-Z, a blockchain-based energy trading platform that enables direct peer-to-peer energy exchange among producers, suppliers, and consumers.

Internet of Things (IoT): Türk Telekom's IoT services support a network of interconnected devices, facilitating automated and remote control of processes, driven by the need for data-based decision-making.

Virtual/Augmented Reality: Türk Telekom collaborates with the startup Nara to integrate VR/AR technologies into education, enabling interactive, instructor-guided virtual classroom experiences.

Cryptocurrency: Two pilot projects—CryptoIndex-Series and Resardis—were accepted into Türk Telekom's innovation program. These initiatives offer AI-based tools and decentralized exchange platforms for crypto trading.

Digital Twin: Partnering with its subsidiary İnova, Türk Telekom applies digital twin technology in smart city projects. The SkywaveCity platform enables centralized monitoring of urban health, traffic, and energy systems.

Machine Learning: Türk Telekom developed an open-source AI in the Operations system to reduce costs, minimize revenue loss from disruptions, and improve customer satisfaction.

Robotic Systems: Robotic process automation is used to enhance efficiency and reduce costs in sectors such as manufacturing, finance, e-commerce, and telecommunications.

Voice Assistant Systems: In the Türk Telekom Online Services app, users can send money using

voice commands via Apple's Siri, demonstrating how voice assistants improve service accessibility.

Infrastructure, Suppliers, Users, and Management

Türk Telekom's infrastructure includes cyber-physical systems, cybersecurity, cloud computing, system integration, and big data platforms. From the perspectives of suppliers, users, and management, the company emphasizes supporting domestic digital technology and industrial firms, enhancing technology acquisition and innovation capabilities, delivering digital transformation outcomes to end-users, and institutionalizing digital transformation by creating relevant departments and governance structures.

Methodology

The study aims to measure the perception of Türk Telekom Company employees about their knowledge and their company's activities on digital transformation processes. The study also hypothesized that young age groups (26-30) have the most knowledge on digital transformation processes due to their predisposition to digital technologies. In that context, we also aimed to test this hypothesis.

Thus, we designed a quantitative research strategy. Data was collected through a structured survey comprising two sections. The first section included 10 questions about demographic characteristics (gender, age, education, department, position, and experience). The second section assessed participants' awareness of their digital transformation level and that of their institution. To check whether the results are statistically different among age groups, t-tests were also conducted using the R statistical software program.

As shown in Table 7, the participants were asked to score the following questions on a Likert scale of 1 to 5. (1-lowest, 2-low, 3-moderate, 4-high, 5-highest)

Table 7. Survey Questions

Code	Questions
YZKBSD	Please evaluate your knowledge regarding artificial intelligence.
YZKSFD	Please evaluate your company's activities regarding artificial intelligence.
SGKBSD	Please evaluate your knowledge regarding virtual reality.
SGKSFD	Please evaluate your company's activities regarding virtual reality.
AGKBSD	Please evaluate your knowledge regarding augmented reality.
AGKSFD	Please evaluate your company's activities regarding augmented reality.
IOTKBSD	Please evaluate your knowledge regarding the Internet of Things (IoT).
IOTKSFD	Please evaluate your company's activities regarding the Internet of Things (IoT).
DJKBSD	Please evaluate your knowledge regarding digital twin technologies.
DJKSFD	Please evaluate your company's activities regarding digital twin technologies.
BZKBSD	Please evaluate your blockchain knowledge.
BZKSFD	Please evaluate your company's activities regarding blockchain.
KPKBSD	Please evaluate your cryptocurrency knowledge.
KPKSFD	Please evaluate your company's activities regarding cryptocurrency.
MLKBSD	Please evaluate your knowledge regarding machine learning.
MLKSFD	Please evaluate your company's activities regarding machine learning.
RSKBSD	Please evaluate your knowledge regarding robotic systems.
RSKSFD	Please evaluate your company's activities regarding robotic systems.
SASKBSD	Please evaluate your knowledge regarding voice assistant systems.
SASKSFD	Please evaluate your company's activities regarding voice assistant systems.
SGSKBSD	Please evaluate your knowledge regarding cybersecurity systems.
SGKSFD	Please evaluate your company's activities regarding cybersecurity systems.
BVKBSD	Please evaluate your knowledge regarding big data.
BVKSFD	Please evaluate your company's activities regarding big data.
SEKBSD	Please evaluate your knowledge regarding system integration.
SEKSFD	Please evaluate your company's activities regarding system integration.
BBSKBSD	Please evaluate your knowledge regarding cloud computing systems.
BBSKSFD	Please evaluate your company's activities regarding cloud computing systems.
IKDDKBSD	Please evaluate your knowledge regarding digital transformation in human resources.
SIKDDFD	Please evaluate your company's activities regarding digital transformation in human resources.
DDFKSKD	Please evaluate your contribution to your company's digital transformation efforts.

SYTVSFDDFND	Please evaluate your company's support for local technology and industrial firms in their digital transformation efforts.
SDDFSKTEKBSD	Please evaluate your knowledge regarding the end-user impact of your company's digital transformation activities.
BMVSKOSDDSKD	As a customer or user, please evaluate the end-user side of your company's digital transformation activities.
SDDFNYKKBSD	Please evaluate your knowledge regarding how your company's digital transformation activities are conducted.
SMDABBAOV-DOSSM	Please rank your company's current perspective and prioritization on the following topics from 1 to 7.
TDEAACVDDD-FOED	Please evaluate the impact of the global COVID-19 pandemic on digital transformation efforts.
TDE-AACVDTSDDFED	Please evaluate the impact of the global COVID-19 pandemic on digital transformation efforts in the telecommunications sector.
TDEAACVDTT-DDFOED	Please evaluate the impact of the global COVID-19 pandemic on digital transformation efforts within Türk Telekom.

Data

The research focused on Türk Telekom, one of Türkiye's leading and long-established telecommunications firms. The aim was to assess employee awareness regarding digital transformation parameters and identify areas of strength and improvement within the organization. A total of 288 Türk Telekom employees participated in the survey. Surveys were distributed via email, and responses were collected accordingly.

Findings

Demographic data from participants are shown in Tables 8–14. Eighty-two respondents (28.47%) were between 36 and 40 years old, followed by 76 participants (26.39%) aged 41 and above, and 71 (24.65%) aged 31–35, respectively. The number of respondents in the 26–30 age group was 48 (16.67%), while 11 participants (3.82%) were aged 18–25.

Table 8. Age Distribution

Age Groups	Rate (%)	Responses
18-25	3,82	11
26-30	16,67	48
31-35	24,65	71
36-40	28,47	82
41 and older	26,39	76
Total	%100	288

On the other hand, the number of male participants was 217, with a rate of 75.35%, while only 71 participants (24.65%) were female.

Table 9. Gender Distribution

Gender	Rate (%)	Responses
Female	24,65	71
Male	75,35	217
Total	%100	288

The participants' educational background indicates that the majority, 169 individuals (58.68%), held an undergraduate degree from a university. This group was followed by 71 participants (24.65%) with a master's degree, while only 3 participants (0.69%) held a Ph.D. degree.

Table 10. Education Levels

Education Levels	Rate (%)	Responses
High School	3,47	10
Associate degree	12,50	36
Undergraduate	58,68	169
Graduate	24,65	71
Ph.D. degree	0,69	2
Total	%100	288

The respondents were asked to mention their experience in the telecommunication sector. Seventy-five respondents (26.04%) had 11 to 15 years of experience in the telecommunications sector, while 78 participants (27.08%) had more than 15 years of experience. Additionally, 135 participants (46.87%) had less than 10 years of experience in the sector.

Table 11. Industry Experience

Experience (Years)	Rate (%)	Responses
0-2	13,54	39
3-7	18,40	53
8-10	14,93	43
11-15	26,04	75
16-20	12,50	36
21-29	13,54	39
30 and More	1,04	3
Total	%100	288

The responses indicated that 74 participants (25.59%) have an experience within Türk Telekom for 11 to 15 years. While 48 participants (16.66%) have over 15 years of experience, more than half of the respondents—166 individuals (57.65%)—have less than 10 years of within-organization experience.

Table 12. Company Experience

Company Experience (Years)	Rate (%)	Responses
0-2	20,49	59
3-7	21,18	61
8-10	15,97	46
11-15	25,69	74
16-20	9,72	28
21-29	6,25	18
30 and more	0,69	2
Total	%100	288

On the other hand, 108 individuals held specialist positions, followed by 86 individuals in senior specialist roles. Only 31 participants held managerial or higher-level positions. Additionally, 39 technicians, 23 assistant specialists, and one intern responded to the survey.

Table 13. Company Positions

Positions	Rate (%)	Responses
Intern	0,35	1
Technician	13,54	39
Assistant Expert	7,99	23
Expert	37,50	108
Senior Expert	29,86	86
Executive	3,47	10
Manager	5,21	15
Group Manager	1,04	3
Director	1,04	3
Total	%100	288

One hundred eighty-seven participants responded to the survey of those who work in the Technology Department. Although we sent them the questionnaire, no responses were received from the Internal Audit Department and the Corporate Risk and Business Continuity Department.

Table 14. Departments

Departments	Rate (%)	Responses
Finance	4,51	13
Support Services and Procurement	1,04	3
Individual Sales	2,43	7
Corporate Sales	4,17	12
Technology	64,93	187
Strategy, Planning, and Digital	4,86	14
Human Resources	2,43	7
Law and Regulation	0,69	2
Wholesales	2,78	8
Regional	8,68	25
Other	3,47	10
Total	%100	288

Based on the results of the analysis, the most well-known digital transformation parameter was

identified as *system integration*. Employees demonstrated an above-average level of knowledge on this topic, which may be attributed to their frequent involvement in related projects and tasks.

System integration was followed by *big data*, *cybersecurity*, and the *Internet of Things (IoT)* in terms of awareness. Conversely, *digital twin* technology emerged as the least known digital transformation parameter.

Table 15. T-Test Results for the Age Groups 26-30 years old vs. others)

Parameters	T-test	df	p-value
YZKBSD	-0,86296	218	0,8054
SGKBSD	-0,2898	218	0,6139
AGKBSD	0,054995	218	0,5219
IOTKBSD	-0,53351	218	0,7029
DJKBSD	-0,15839	218	0,5629
BZKBSD	-0,368	218	0,6434
KPKBSD	-0,06513	218	0,5259
MLKBSD	1,9664	218	0,02526
RSKBSD	-0,28958	218	0,6138
SASKBSD	-0,36519	218	0,6423
SGSKBSD	-1,704	218	0,9551
BVKBSD	-0,49005	218	0,6877
SEKBSD	0,29148	218	0,3855
BBSKBSD	-0,21615	218	0,5855
IKDDKBSD	0,58464	218	0,2797

It was hypothesized that employees between 26 and 30 years old would have a better knowledge level of digital transformation processes due to their aptitude for digital tools. The study also examined whether there were statistically significant differences in digital transformation knowledge levels among employees aged 26–30 compared to other age groups. No significant differences in knowledge levels related to artificial intelligence, virtual reality, augmented reality, IoT, digital twin, blockchain, cryptocurrency, robotic systems, voice assistant systems, cybersecurity, big data, system integration, cloud computing, and digital transformation in human resources. However, participants aged 26–30 were found to have a higher knowledge level regarding *machine learning* than other age groups.

Regarding the perception of the respondents on the digital transformation activities of the company they work for, *cybersecurity* was ranked first, followed by *big data* and *system integration*. *Digital twin* and *cryptocurrency* were the least known

parameters among employees. Table 16 exhibits the summary of responses.

Table 16. Summary of Responses

Technology/Area	Knowledge Levels	Awareness of Company Activities
Artificial Intelligence (AI)	38% moderate, 32% low, 21% high	25% unaware
Virtual Reality (VR)	35% low, 6% none, 18% high	65% low
Augmented Reality (AR)	33% low, 16% none, 17% high	45% low
Internet of Things (IoT)	17% low, 13% none, 38% high	45% low
Digital Twins	64% none, 17% low, 7% high	77% none
Blockchain	30% low, 17% none, 22% high	79% low
Cryptocurrency	28% low, 8% none, 29% high	87% low
Machine Learning	34% low, 18% none, 25% high	70% low
Robotic Systems	34% low, 12% none, 24% high	69% low
Voice Assistants	30% low, 15% none, 29% high	44% low, 36% high
Cybersecurity	4% none, 26% low, 35% moderate, 33% high	70% high
Big Data	28% low, 11% none, 31% high	45% high
System Integration	15% low, 10% none, 50% high	57% high
Cloud Computing	18% low, 6% none, 42% high	60% high
HR Digital Transformation	28% low, 25% none, 20% high	54% low

The impact of COVID-19 on the future of digital transformation was also examined among the participants. 82% of respondents believed the pandemic would accelerate digital transformation and lead to permanent change. Only 5% thought everything would return to pre-pandemic norms, while 3% had no knowledge, 7% expected minimal impact, and 3% anticipated no effect.

When examining the pandemic's effect specifically on the digital transformation of the telecommunications sector, 83% of participants responded that the pandemic would accelerate and sustain transformation. Regarding Türk Telekom, 72% of participants believed the pandemic would accelerate and entrench the company's digital transformation efforts.

Survey results thus indicate that employees widely perceive COVID-19 as a significant catalyst for digital transformation, with an expectation of long-term changes. The pandemic was the only topic on which approximately 80% of all participants shared a common perspective, likely due to

its profound effects on both personal and professional lives.

Discussion and Conclusion

Digital transformation has progressed from a basic necessity to a strategic imperative across all sectors. Nevertheless, the processes of transformation must be examined within the context of each specific industry, as the parameters guiding such transformation differ according to sectoral characteristics and requirements. Consequently, organizations seeking to implement digital transformation initiatives must first identify the sector-specific parameters relevant to their operations and determine the components to be employed. On this basis, a comprehensive needs assessment for digital transformation can then be developed.

Artificial intelligence, blockchain, the Internet of Things (IoT), virtual/augmented reality, cryptocurrency, digital twin technology, machine learning, robotic systems, voice assistant systems, cybersecurity, big data, system integration, and cloud computing are important digital transformation parameters for many industries, including the telecommunication sector.

This study identified the most well-known digital transformation parameter among Türk Telekom employees as system integration, followed by big data, cybersecurity, and IoT. On the other hand, digital twin technology emerged as the least familiar parameter.

Regarding awareness of company activities related to digital transformation, cybersecurity was the most acknowledged domain among Türk Telekom employees, followed by big data and system integration. Conversely, digital twin and cryptocurrency were employees' least known areas of corporate activity.

The findings of the study indicated similar results both for the knowledge level of the employees and their awareness of the company's digital transformation activities. Furthermore, the findings of the survey related to the impact of the COVID-19 pandemic on the future of digital transformation are consistent with the findings of previous studies by Nalbantoğlu (2021) and Budak & Korkmaz (2020), which suggest that the pandemic

has accelerated digital transformation and that these changes are likely to become permanent.

Malunga (2023) underlines the importance of digital leaders exerting both direct and indirect influence on the organizational digital transformation. Specifically, leadership within the telecommunications sector must foster a digital mindset, broaden its sensing capabilities across diverse value chains, and pursue cross-industry integration as a means of ensuring long-term sustainability and competitive advantage. Thus, it is recommended that Türk Telekom enhance its internal communication and information sharing regarding its digital transformation initiatives. In this context, as Yurdakul et al. (2017) suggest, it would be beneficial to implement informative training modules and workshops through the Türk Telekom Academy to raise awareness among employees and underline the importance of digital transformation on business success. Such initiatives would help employees better understand how their work contributes to digital transformation and allow them to find greater meaning and purpose in their roles, ultimately enhancing productivity.

In addition, it would be valuable to organize promotional activities that inform employees about the services Türk Telekom provides to end-users, customers, and firms operating in domestic production, manufacturing, and industrial sectors. Managers of each unit should also communicate and emphasize the aspects of digital transformation relevant to their respective departments. Enabling employees to observe the tangible outcomes of their work, such as products or services, may serve as a motivational factor that enhances job performance. Moreover, employees outside of technology departments should also be provided with targeted briefings to raise their awareness of how digital transformation is being integrated into their work.

One limitation of this study is that the survey was conducted only with Türk Telekom employees. Therefore, the findings cannot be generalized to the entire telecommunications sector. Additionally, considering the company's total number of employees and the survey's sample size, the results may not fully represent the organization as a

whole. Nonetheless, future studies that include other key players in the industry, such as Turkcell and Vodafone, could yield more generalizable and sector-wide insights. Expanding the scope of digital transformation parameters and examining them in greater detail would further enrich the study's outcomes, providing valuable guidance for both researchers and practitioners in future strategic planning.

While this study concentrates specifically on Türk Telekom employees' perceptions regarding their knowledge and the company's digital transformation initiatives, the insights derived may offer valuable guidance for the telecommunications sector more broadly and support policymakers in formulating effective digitalization strategies.

The survey findings underscore the uneven distribution of knowledge across different digital technologies. Company managers and policymakers should therefore prioritize sector-wide capacity-building initiatives aimed at improving digital literacy and technical competencies. Structured training programs would ensure that employees at all organizational levels are equipped with the necessary skills to engage with advanced technologies such as artificial intelligence, blockchain, and digital twins.

Given that telecommunications functions as a backbone for other industries, policies should encourage the integration of telecom services with critical sectors such as finance, healthcare, education, and manufacturing. Establishing innovative ecosystems and collaborative platforms would foster the co-development of digital applications, thereby creating new value chains and reinforcing national competitiveness.

The advancement of digital transformation requires sustained investment in research and development. Policymakers could facilitate this process by offering fiscal incentives, such as tax relief and targeted grants, to telecommunications firms investing in emerging technologies. Particular attention should be directed toward fostering domestic capabilities in cybersecurity, cloud services, and system integration, reducing dependence on foreign technology providers and strengthening digital sovereignty.

A notable finding of this study was the limited employee awareness of ongoing corporate digital

transformation initiatives. To address this gap, policies should require telecommunications companies to develop comprehensive communication frameworks that systematically inform employees of ongoing projects, objectives, and outcomes. Enhancing internal transparency will strengthen employee engagement and align organizational culture with strategic digital goals.

To sustain and accelerate digital transformation, regulatory authorities should design frameworks tailored to the unique requirements of the telecommunications industry. These should include standards for interoperability, robust cybersecurity protocols, and ethical guidelines for the deployment of artificial intelligence and the Internet of Things. Such frameworks would not only safeguard users but also provide clarity and stability for firms investing in digital innovation.

The pandemic has acted as a catalyst for digital adoption, particularly in remote services and cloud-based applications. Policymakers should embed these gains into long-term digital strategies by supporting projects that enhance network resilience, scalability, and inclusivity. Institutionalizing pandemic-driven innovations would ensure that the sector remains adaptive to future disruptions while maintaining momentum in digital transformation.

These recommendations, while derived from the perceptions of Türk Telekom employees, extend to the broader telecommunications sector. By addressing skill gaps, promoting innovation, and ensuring regulatory alignment, policymakers can strengthen the sector's role as a central enabler of national digitalization agendas.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The authors declare no conflict of interest.*

Ethical Approval: *The study involved survey research with 288 employees of Türk Telekom. Data were collected on a voluntary basis, and confidentiality and anonymity were strictly maintained. If required, details of ethical approval can be provided by the authors.*

Informed Consent: *Informed consent was obtained from all participants prior to the survey.*

Data Availability: *The datasets generated and analyzed during the current study are not publicly available due to privacy and confidentiality restrictions but are available from the authors on reasonable request.*

Authors' Contributions: *All authors contributed to the design, implementation, analysis, and writing of the study. The first author coordinated the research process, the second author contributed to data collection, and the third author supported the analysis and manuscript preparation.*

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RESEARCH ARTICLE

Cooperation as a Sexual Selection Trait: Insights from Gender-Specific Mate Preferences*

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Abstract

Cooperation is considered an essential component of natural selection due to its critical role in ensuring the survival of individuals and communities. However, whether cooperation is also a trait favored in the context of sexual selection remains an ongoing debate in evolutionary psychology. This study examined whether cooperative behavior increases individual attractiveness during the mate selection process. Participants were recruited through convenience sampling via Google Forms. In the first study, 199 participants were randomly assigned to one of three levels of cooperation. The results revealed that female participants preferred men who displayed cooperative behavior. In the second study, the effect of cooperation was evaluated together with the gender of the individuals involved. A total of 230 participants watched videos depicting different cooperation scenarios and evaluated the target person as a potential partner. The findings indicated that women found men who cooperated with both men and women more attractive, whereas men showed a preference only for women who cooperated with other women. In conclusion, cooperation is perceived differently by men and women within the framework of sexual selection, and particularly women regard cooperative behavior as a strong indicator of attractiveness.

Keywords: Cooperation, sexual selection theory, gender differences, altruism**Öz**

İş birliği, bireylerin ve toplulukların hayatta kalmasını sağlamadaki kritik rolü nedeniyle doğal seçilimin vazgeçilmez bir unsuru olarak görülmektedir. Ancak iş birliğinin aynı zamanda cinsel seçim açısından da tercih edilen bir özellik olup olmadığı konusu, evrimsel psikolojide güncelliğini koruyan bir tartışma alanıdır. Bu çalışmada, iş birliğinin cinsel seçim sürecinde bireyin çekiciliğini artırıp artırmadığı araştırılmıştır. Katılımcılar, Google Forms aracılığıyla ulaşılan ulaşılabilirlik örnekleme yöntemiyle belirlenmiştir. Birinci çalışmada 199 katılımcı rastgele olarak üç farklı iş birliği düzeyinden birine atanmış ve sonuçlar, kadınların iş birliği sergileyen erkekleri daha çok tercih ettiğini göstermiştir. İkinci çalışmada ise iş birliğinin etkisi, iş birliği yapılan kişilerin cinsiyetiyle birlikte incelenmiştir. Bu kapsamda 230 katılımcı, iş birliği senaryolarını içeren videoları izleyerek hedef kişiyi potansiyel partner olarak değerlendirmiştir. Bulgular, kadınların hem erkeklerle hem de kadınlarla iş birliği yapan erkekleri daha çekici bulduğunu, erkeklerin ise yalnızca kadınlarla iş birliği yapan kadınları daha çok tercih ettiğini ortaya koymuştur. Sonuç olarak, iş birliğinin cinsel seçim bağlamında farklı cinsiyetlerde farklı biçimlerde değerlendirildiği ve özellikle kadınların iş birliği davranışını güçlü bir çekicilik unsuru olarak gördüğü anlaşılmaktadır.

Anahtar Kelimeler: İş birliği, cinsel seçim kuramı, cinsiyet farklılıkları, özgecilik.

* This study is based on the undergraduate thesis project of Fatma Akbulut, supervised by Ahmet Yasin Şenyurt.

Introduction

Altruistic behavior, in which an individual benefits others at their own expense, has been observed in various species. Primates, for instance, groom one another to maintain hygiene (Seyfarth & Cheney, 1984). In evolution, situations can arise in which an individual exhibits altruism, even if it is not reciprocal, to benefit members of the same species (Riolo et al., 2001). This type of behavior supports the continuation of the species and is passed down to future generations (Üzümçeker et al., 2019).

Therefore, altruistic cooperation is typically viewed as an outcome of natural selection (Sachs et al., 2004), and is explained through five fundamental principles: kin selection, direct reciprocity, indirect reciprocity, network reciprocity, and group selection (Nowak, 2006). Kin selection (Patten, 2010) suggests that cooperation has evolved because helping relatives can enhance the survival and reproduction of shared genes, even if it incurs personal costs. Direct reciprocity (Roberts, 2008) suggests that individuals are more inclined to cooperate when they anticipate reciprocal actions in the future, fostering a cycle of mutual support. Indirect reciprocity (Roberts, 2008) highlights that altruistic behavior can boost an individual's social status or reputation, thereby increasing the likelihood of receiving help from others in future interactions. Network reciprocity (Floría et al., 2009) explains how cooperation can flourish within structured populations or networks, where interactions are more common among close neighbors than among the entire population. Finally, group selection (Patten, 2010) proposes that cooperators can outcompete non-cooperators, leading to the proliferation of cooperative traits across groups and ultimately within the population.

First theorists to suggest that sexual selection, as well as natural selection, played a role in the evolution of cooperation were Zahavi (1975; Zahavi & Zahavi 1997) and Eshel and Sforza (1982). Zahavi suggested that cooperation is a handicap similar to the peacock's colorful feathers, but it provides an advantage in sexual selection due to the other traits it signals, such as strength and health. Eshel and Sforza (1982) mathematically demonstrated that the evolution of cooperative behavior is influenced not only by natural selection, but also

by the selection of cooperative individuals within natural environments. Pilot (2005) also demonstrated using computer simulations that even in the absence of reciprocation, cooperation can be evolutionarily stable if it signals traits such as the cooperators' physical condition and prestige.

According to the sexual selection theory, opting for more cooperative partners can result in immediate and long-term advantages. By selecting individuals who offer superior parental care, higher quality mates can be ensured. Additionally, offspring produced with these partners are more likely to be of higher quality and exhibit increased cooperative tendencies (Covas and Doutrelant, 2019).

In one study (Farrelly et al., 2007), participants played four different games on an online platform while viewing images of targets with high and low attractiveness. In the **Mutualism Game**, participants obtained better results by donating (cooperating) regardless of their partner's actions, which tests their understanding and motivation to act in economic interests without allowing for displays of altruism. In the **One-Shot Prisoner's Dilemma (PD) Game**, cooperation is rational for those with a sense of fairness and trust in their partner, although defection is a rational choice otherwise. The **Dictator Game** showed that giving can reflect a sense of fairness or generosity, while in the **Charity Dictator Game**, where donations were directed toward charity rather than the partner, altruistic signaling was emphasized. The results revealed that both male and female participants exhibited more cooperation with highly attractive targets and found cooperative men and women to be more attractive. Additionally, in the high-cooperation condition, men's attractiveness ratings for both low- and high-attractiveness women significantly increased by the end of the four games. Similarly, women's attractiveness ratings for low-attractiveness men also increased by the end of the games under high-cooperation conditions. However, attractiveness did not affect same-sex cooperation.

Phillips et al. (2008) used the Mate Preference for Altruistic Traits (MPAT) scale to measure the value of altruistic qualities in potential mates. Their research, which involved 1,118 participants

across three studies, found evidence of mate selection based on altruistic traits. This study presented two main findings, supporting the hypothesis that altruistic traits evolved through sexual selection. First, there was a significant correlation between the degree of MPAT and the "altruistic personality" of the chosen partner, suggesting that mate choice is influenced by altruism. Second, women's stronger preference for altruistic traits aligned with evolutionary predictions remained significant, even when controlling for participants' own altruistic tendencies and relationship duration. Overall, these findings support the idea that altruism may play a role in human mate selection, with women valuing altruistic traits more than men do. The study concluded that altruistic behavior could significantly influence human mating preferences, which is consistent with the theory of sexual selection.

In another study, there was evidence that sexual selection plays a significant role in shaping cooperative behavior among men in rural Senegal, with the presence of female observers enhancing males' willingness to cooperate. Conversely, women's cooperative behavior appears to be less influenced by the potential for sexual selection and broader social factors (Tognetti et al., 2012).

Gender differences in mate preference

As a result of natural and sexual selection processes, individuals may develop different mating strategies for long- and short-term mating. Men and women may develop similar or different strategies for this process. The fundamental reason for this is that both sexes invest differently in producing a single offspring (Buss & Schmitt, 2019). Different challenges may arise in short-term relationships with low commitment versus long-term relationships with heavy commitment, affecting preference shaping (e.g., compatibility issues). Therefore, the strategies developed differ regarding short- and long-term relationship preferences (Jonason and Buss 2012). The Sexual Strategies Theory (Buss, 1998) is an evolutionary explanation of how these differences occur. For instance, while a man seeks to ensure that he is the biological father of a child, a woman aims to secure the man's ability and willingness to invest in the child's upbringing.

This dynamic influences how women and men within a group evaluate each other. Women find men surrounded by other women more attractive, in line with the principles of the social learning theory. Conversely, men find women surrounded by other men less attractive.

In terms of mate preference, women tend to be more selective than men, particularly when evaluating character and status. Although cultural variations exist, certain traits such as a preference for a waist-to-hip ratio indicative of fertility are common across many cultures (Buss, 1989; Minervini & McAndrew, 2006). Women generally place greater emphasis on character traits than men (Buss & Barnes, 1986; Bressler et al., 2006; Whyte et al., 2021). For instance, Buss and Barnes (1986) found that women value personality traits such as kindness, understanding, honesty, and dependability, as well as status traits such as earning capacity and ambition, more than men do. Conversely, men prioritize physical appearance traits such as attractiveness and beauty more than women. Whyte (2021) corroborates these findings, noting that men focus on attractiveness, while women emphasize character traits, such as trust and emotional connection, and status variables, such as age and income.

In summary, although cooperation is evolutionarily transmitted, sexual selection also plays a role in its propagation. However, owing to gender differences in sexual selection, the impact of engaging in cooperation may vary between men and women. Building on sexual selection theory, this study aimed to investigate two research questions: (1) Does cooperation influence individual attractiveness in the context of sexual selection? (2) How do gender-specific preferences for cooperation manifest in mate selection? These questions guided our investigation into the role of cooperation as a sexual selection trait. This study explores the influence of cooperation on desirability in sexual selection through two studies. In the first study, cooperation was manipulated by using vignettes. In the second study, both cooperation and the gender of the individuals with whom the target cooperates are manipulated using videos.

The hypothesis of Study 1 is that (H1) the level of cooperation demonstrated by an individual affects their attractiveness to the opposite gender,

with cooperative behaviors expected to lead to higher attractiveness ratings, and that this effect will be gender-specific.

Method of Study 1

This study was conducted using a 3 (cooperation: altruism alone, altruism with cooperation, altruism without cooperation) $\times$ 2 (gender of participant: female, male) between-subject design. Participants were presented with three different vignettes: the first described the target helping a friend individually; the second indicated that the target's help involved cooperation; and the third stated that the target helped without engaging in cooperation (see Appendix A). Male participants read a vignette featuring a woman, while female participants read a vignette featuring a man. The gender difference in the target was achieved by manipulating the names of the targets in the vignettes.

Participants

A total of 199 participants were included in the study, with 100 females and 99 males ($M_{age} = 27.2$, $SD = 6.45$, %95CI [26.3-28.1]). Participants were reached using a convenient sampling method using Google Forms. There were no significant differences in average age across the research conditions ($F(2, 293) = .669$, $p > .05$). Each condition had a minimum of 32 participants and a maximum of 34.

Measurements

After the participants read the vignettes, they responded to 11 questions (i.e., ... could be attractive, ... might be beautiful/handsome, ... could be considered for a long-term relationship, ... could be a good partner) on an 11-point Likert Scale (0: Strongly disagree, 10: Strongly agree). These questions were chosen by examining both the international (Buss & Barnes, 1986) and culture-specific literature (Gündoğdu Aktürk, 2010) to measure mate preference.

Analysis

The data were analyzed using JAMOVİ with a 3×2 between-subject MANOVA.

Results

Regarding the "good partner" variable, the MANOVA results revealed no significant main effects for gender ($F(1, 193) = .82$, $p > .05$) or cooperation ($F(2, 193) = .25$, $p > .05$). However, there was a significant interaction effect between gender and cooperation ($F(2, 193) = 6.66$, $p = .046$) (see Figure 1). Male participants rated the "good partner" variable the highest ($M = 5.56$, $SD = 1.19$, %95 CI [5.15, 5.97]) for female targets described as not cooperating. In contrast, female participants rated the non-cooperating male target the lowest ($M = 5.03$, $SD = 1.38$, %95 CI [4.54, 5.52]) (Figure 1).

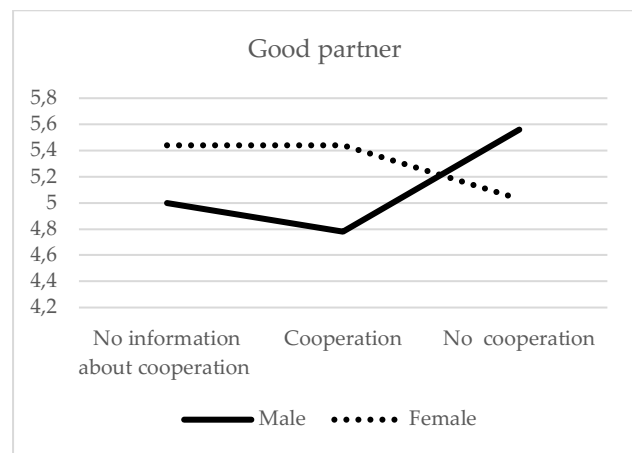


Figure 1. Means for evaluating the target as a good partner. Male and female in the graph represent the gender of the participants.

For the "considering as a potential spouse" variable, neither gender ($F(1, 193) = .52$, $p > .05$) nor cooperation ($F(2, 193) = .90$, $p > .05$) had a significant main effect. However, the interaction between gender and cooperation was significant ($F(2, 193) = 3.68$, $p < .05$) (see Figure 2). Male participants indicated that they found non-cooperating female targets to be more suitable as partners, with a mean rating of 5.26 ($SD = 1.52$, %95 CI [4.82, 5.71]). By contrast, female participants rated non-cooperating male targets as the least suitable, with a mean rating of 4.42, $SD = 1.25$, %95 CI [3.67, 4.66] (Figure 2).

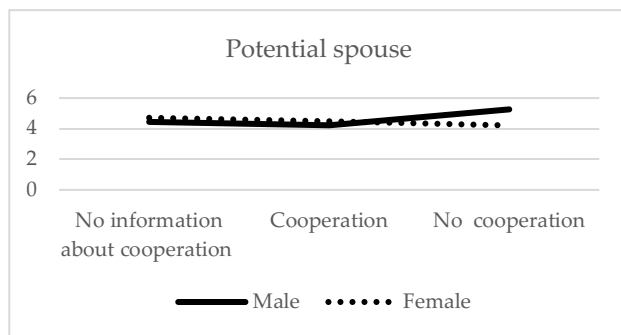


Figure 2. Means for evaluating the target as a potential spouse. Male and female in the graph represent the gender of the participants.

In terms of the "evaluating beautiful/handsome" variable, the MANOVA results revealed no significant main effects of gender ($F(1, 193) = .28, p > .05$) or cooperation ($F(2, 193) = .53, p > .05$). However, a significant interaction effect between gender and cooperation was observed, $F(2, 193) = 3.08, p < .05$ (see Figure 3). Male participants rated non-cooperative female targets as the most attractive, with a mean rating of 5.21, $SD = 1.34$, %95CI [4.74, 5.67]. In contrast, female participants rated non-cooperating male targets as the least handsome, with a mean rating of 4.30 ($SD = 1.49$, %95 CI [3.77, 4.30]) (Figure 3).

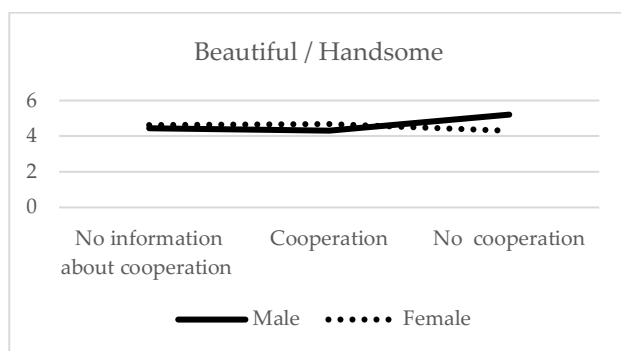


Figure 3. Means for evaluating the target as beautiful or handsome. Male and female in the graph represent the gender of the participants.

No significant interaction effects between cooperation and gender were found for the other dependent variables. There were two main interaction effects of gender. Male participants evaluated the targets as more suitable partners than females did ($F(1,193) = 4.84, p = .029$). In addition, males evaluated the targets as more sufficient than females did, $F(1,193) = 3.97, p = .048$.

Discussion of Study 1 and Introduction of Study 2

The results show that men perceive women who do not cooperate as more attractive, as better candidates for a partner, and as more suitable as good partners. This result contradicts that of previous research (Farrelly et al., 2007). Keeping in mind that Farrelly and colleagues worked on altruism, our study included cooperative altruistic behavior. In contrast, women rated non-cooperating males the lowest among all these variables. This result is consistent with those reported in the literature (Farrelly et al. 2007; Phillips et al. 2008). These results partially supported H1. Cooperation increased the mate value of men for women on the other hand decreased mate value of women for men.

According to both Parental Investment Theory and Sexual Strategies Theory (Buss & Schmitt, 1993), men and women face different challenges in mate selection and preferences for short- and long-term relationships, which leads them to use different strategies. One of these differences arises when the target person is in groups with members of the same sex compared with groups with members of the opposite sex (Hill & Buss, 2008). Men aim to avoid competition to ensure the continuation of their lineage, which is why they find women surrounded by other men to be less attractive. By contrast, women value a man's status and resources, and they generally find women surrounded by men more attractive. From this perspective, it can be inferred that men might view a woman's lack of cooperation as a reduction in competition, despite not knowing with whom she is cooperating. On the other hand, women may interpret a man's lack of cooperation as a sign of lacking social capital or an indication that he might also be uncooperative as a spouse.

To test these assumptions, it is necessary to measure participants' evaluations of target individuals in conditions where targets either cooperate or do not cooperate with members of the opposite gender and same gender. If men prefer women who do not cooperate with men more than women who do not cooperate with women, this preference cannot be attributed to a lack of cooperation but

can be attributed to competition (H2). We also expected women to prefer men who cooperate with same-gender individuals and those of the opposite gender (H3). This is because such cooperation would indicate that the man is likely to offer future cooperation, possess the necessary social capital, or be attractive to other women. Additionally, we did not include the 'altruism with no cooperation' condition in the second study because we found no significant differences between the 'altruism with individual working' and 'altruism with cooperation' conditions for either gender.

Methods of Study 2

Study 2 employed a $2 \times 2 \times 2$ design to dissect the impact of cooperation and gender dynamics on sexual selection. This design aimed to isolate the effects of cooperation (present or absent), gender composition of the cooperation group (same or opposite gender), and gender of the participants. By structuring the conditions in this manner, we sought to understand how these variables interact to influence the perceptions of mate suitability.

The data has been supplied as a supplementary file and additionally uploaded to Mendeley Data.

Participants

A total of 230 participants were included in the study, including 116 females and 114 males ($M_{age} = 24.5$, $SD = 5.60$, %95CI [23.8-25.3]). Participants were reached using a convenient sampling method using Google Forms. There were no significant differences in average age across research conditions ($F(1, 222) = .73$, $p > .05$).

Manipulation materials

For this study, a total of 16 videos, each approximately 30 seconds long, were produced, with two videos for each of the eight conditions (See Appendix B for sample videos). The 16 videos featured 3 male and 3 female collaborators.

For male participants, the first video (opposite-gender, no cooperation condition) showed a female collaborator seated between two male collaborators, where all three performed the envelope-

folding task without interacting with each other (opposite-gender, no cooperation condition) in the classroom setting. In the second video (opposite-gender, cooperation condition), the same female collaborator was seated between two male collaborators, but this time she cooperated with the men while performing the task. In the third video (same-gender, no cooperation condition), the female collaborator was seated between two female collaborators and all three completed the envelope-folding task without any interaction. The fourth video (same-gender, cooperation condition) featured the same female collaborator seated between two female collaborators, but here she cooperated with other women during the task.

The target person was the same for all four videos. To control for the attractiveness of the target, four additional videos were created, where one of the women from the first four videos was the target, and the target woman from the initial videos was one of the collaborators. Male participants were randomly assigned to one of the conditions and displayed a video. The same process was applied to female participants using male targets, and one of the eight videos was shown to them.

The envelope-folding task was chosen for its simplicity and the clear opportunity it presents for cooperative versus non-cooperative behavior in a controlled setting.

Measurements And Procedure

After the participants watched the video, they were instructed to rate 12 sentences about the target, which was described as "the person in the middle." The sentences were rated on a 7 Likert scale, and the answers were evaluated as the dependent variable in this study. Some of the sentences were "The person performing the task is attractive to me.", "The person performing the task would be a good partner for me," "I would consider a long-term relationship with the person performing the task.", "The person performing the task could be a good parent."

Participants first completed a consent form. They then read the instructions which includes "watch a video and focus on the behavior of the central figure in the video," followed by watching

the video itself. Finally, they completed a demographic information form.

Analysis

A MANOVA was conducted to examine the main and interaction effects of three independent variables—participant gender, presence of collaboration, and whether the collaborator was of the same or opposite gender—on the dependent variables.

Results

The MANOVA results are presented in Table 1. A significant three-way interaction effect (participant gender, cooperation, and gender of cooperators) was found for the perception of the target as a good partner, $F(1,222) = 6.76, p = .01$. Men believed that women who cooperated with other women would be their best partners ($M = 6.00, SD = 1.39, 95\% CI [5.49, 6.51]$), whereas women considered men who cooperated with women to be better partners ($M = 5.45, SD = 1.75, 95\% CI [4.81, 6.09]$). Men gave the lowest ratings to women who did not cooperate with other women ($M = 5.16, SD = 1.53, 95\% CI [4.60, 5.72]$) and women gave the lowest ratings to men who did not cooperate with women ($M = 4.19, SD = 1.97, 95\% CI [3.30, 5.09]$).

Table 1. MANOVA results

Dependent Variables	Gender F (p)	Cooperation with F (p)	Cooperation F (p)	Gender * Cooperation with F (p)	Gender * Cooperation F (p)	Cooperation with * Cooperation F (p)	Gender * Cooperation with * Cooperation F (p)
Attractive	25.82 (<.001)	1.72 (.19)	11.18 (<.001)	0.39 (.53)	3.84 (.05)	0.01 (.92)	2.29 (.13)
Short-term	14.40 (<.001)	0.72 (.40)	5.37 (.021)	0.27 (.60)	1.82 (.18)	0.67 (.40)	3.00 (.084)
Partner	16.29 (<.001)	1.37 (.24)	4.62 (.033)	0.27 (.60)	1.67 (.20)	0.41 (.52)	6.76 (.01)
Beautiful/handsome	27.56 (<.001)	0.01 (.92)	3.93 (.033)	0.18 (.67)	4.41 (.037)	1.71 (.19)	2.91 (.089)
Marriage	18.88 (<.001)	1.79 (.18)	1.98 (.161)	0.02 (.89)	0.36 (.55)	0.71 (.40)	3.11 (.078)
Long term	19.18 (<.001)	1.27 (.26)	3.17 (.076)	0.12 (.73)	2.57 (.11)	1.27 (.26)	5.05 (.026)
Suitable for Parenting	11.54 (.001)	0.69 (.41)	0.23 (.64)	0.32 (.57)	0.81 (.37)	0.51 (.48)	0.32 (.57)
Relationship	25.54 (<.001)	1.84 (.18)	3.15 (.077)	0.31 (.58)	1.46 (.23)	0.08 (.78)	6.14 (.014)
Sufficient partner	21.83 (<.001)	1.43 (.23)	2.26 (.134)	0.02 (.90)	1.34 (.25)	1.25 (.27)	2.77 (.098)
Good parent	14.03 (<.001)	1.29 (.26)	0.05 (.83)	1.43 (.23)	1.50 (.22)	0.66 (.42)	0.53 (.47)
Sufficient	26.73 (<.001)	0.97 (.33)	1.22 (.27)	0.60 (.44)	1.17 (.28)	1.11 (.29)	3.26 (.072)
Good spouse	18.60 (<.001)	1.11 (.30)	1.58 (.21)	0.07 (.79)	0.24 (.63)	0.30 (.58)	3.61 (.059)

Note: p values smaller than .1 were not rounded.

The interaction effect on considering the target for a long-term relationship was significant, $F(1,222) = 5.05, p = .026$. In response to the question on the target person's suitability for a

long-term relationship, men gave the highest ratings to women who cooperated with the same gender ($M = 6.06, SD = 1.41, 95\% CI [5.55, 6.58]$), and women who did not cooperate with the opposite gender ($M = 6.13, SD = 1.18, 95\% CI [5.70, 6.56]$). On the other hand, women gave the highest ratings to men who cooperated with women ($M = 5.39, SD = 1.69, 95\% CI [4.77, 6.01]$). Men gave the lowest ratings to women who cooperated with men ($M = 5.38, SD = 1.53, 95\% CI [4.68, 6.08]$) and women who did not cooperate with women ($M = 5.29, SD = 1.49, 95\% CI [4.74, 5.84]$). Women gave the lowest ratings to men who did not cooperate with women ($M = 4.29, SD = 2.33, 95\% CI [3.23, 5.34]$) and to those who did not cooperate with men ($M = 4.28, SD = 2.07, 95\% CI [3.42-5.14]$).

The three-way interaction significantly affected consideration of the target for entering a relationship, $F(1, 222) = 6.14, p = .014$. In response to the question, 'Would you consider having a relationship with the target person?', men gave the highest ratings to women who did not cooperate with men in the group ($M = 6.00, SD = 1.26, 95\% CI [5.54, 6.46]$) and to women who cooperated with other women in the group ($M = 5.97, SD = 1.45, 95\% CI [5.44, 6.50]$). Women gave the highest ratings to men who cooperated with the opposite gender ($M = 5.32, SD = 1.78, 95\% CI [4.67, 5.97]$).

Men gave the lowest ratings to women who did not cooperate with other women ($M = 5.25, SD = 1.62, 95\% CI [4.83, 5.67]$). Women gave the lowest

ratings to men who did not cooperate with women ($M = 4.05$, $SD = 2.33$, 95% CI [2.99, 5.11]).

The three-way interaction effects of participant gender, collaboration style, and cooperators' gender on considering the target for a short-term relationship ($F(1,222) = 3.00$, $p = .084$), consider for marriage ($F(1,222) = 3.11$, $p = .078$), sufficient partner ($F(1,222) = 2.77$, $p = .098$), sufficient ($F(1,222) = 3.26$, $p = .072$), evaluation of the target as beautiful or handsome ($F(1,222) = 2.91$, $p = .089$) and considered a good spouse ($F(1,222) = 3.61$, $p = .059$) were only marginally significant. As shown in Figure 4, consistent with the results given in the paragraphs above, men gave the highest ratings when women cooperated with other women or when women did not cooperate with men.

On the other hand, women gave the highest ratings to the target when men cooperated with other women. For example, in response to the question, 'Would you consider marrying the target person?', men gave the highest ratings to women who did not cooperate with men ($M = 6.16$, $SD = 1.19$, 95% CI [5.73, 6.60]) and women who cooperated with

women ($M = 6.10$, $SD = 1.33$, 95% CI [5.61–6.58]). On the other hand, women gave the highest ratings to men who cooperated with women ($M = 5.35$, $SD = 1.85$, 95% CI [4.67–6.03]). For the marriage consideration question, men gave the lowest ratings to women who did not cooperate with women ($M = 5.43$, $SD = 1.60$, 95% CI [3.81–5.02]), while women gave the lowest ratings to men who did not cooperate with men ($M = 4.60$, $SD = 1.91$, 95% CI [3.81–5.39]) and those who did not cooperate with women ($M = 4.67$, $SD = 2.22$, 95% CI [3.66–5.66]).

In terms of the perception of the target as beautiful or handsome, men rated women who cooperated with the same gender as the most attractive ($M = 5.61$, $SD = 1.65$, 95% CI [4.97, 6.25]). Women, on the other hand, rated men who cooperated with the opposite gender as the most handsome ($M = 4.52$, $SD = 1.81$, 95% CI [3.85, 5.18]). The conditions under which men gave the lowest attractiveness ratings were women who cooperated with men ($M = 4.71$, $SD = 1.65$, 95% CI [3.96, 5.46]). Women rated men who did not cooperate with either men ($M = 3.44$, $SD = 1.89$, 95% CI [2.66, 4.22]) or women ($M =$



Figure 4. Means for significant and partially significant interaction effects. Sg: same-gender cooperation (male targets cooperate with males, female targets cooperate with females); Og: opposite gender (male targets cooperate with females; female target)

3.43, $SD = 2.11$, 95% CI [2.47, 4.39]) as least handsome.

The interaction effect on the perception of the target as beautiful or handsome was also significant, $F(1,251) = 4.32$, $p = .039$. Men rated women who cooperated with the same gender as the most attractive ($M = 5.61$, $SD = 1.65$, 95% CI [4.97, 6.25]). Women, on the other hand, rated men who cooperated with the opposite gender as the most handsome ($M = 4.52$, $SD = 1.81$, 95% CI [3.85, 5.18]). The conditions under which men gave the lowest attractiveness ratings were women who did not cooperate with women ($M = 4.70$, $SD = 1.71$, 95% CI [4.26, 5.14]) and women who cooperated with men ($M = 4.71$, $SD = 1.65$, 95% CI [3.96, 5.46]). Women rated men who did not cooperate with either men ($M = 3.44$, $SD = 1.89$, 95% CI [2.66, 4.22]) or women ($M = 3.43$, $SD = 2.11$, 95% CI [2.47, 4.39]) as least handsome.

The interaction effects of independent variables on perceived attractiveness of the target ($F(1,222) = 2.29$, $p = .13$), seeing the target as a suitable parent ($F(1,222) = 0.32$, $p = .57$) and evaluating it as a possible good parent ($F(1,222) = 0.53$, $p = .47$) were not significant.

Regarding the main effects, the gender of the participants significantly affected all dependent variables, with males giving higher scores than females across all dependent variables. However, the effects of cooperation with either the same gender or the opposite gender were not significant. The effect of cooperation was only significant for certain dimensions: short-term relationships, partner suitability, attractiveness, long-term relationships, and desire to start a relationship. In these areas, participants showed a higher preference for targets who cooperated. No significant two-way interactions were observed.

Discussion of Study 2

The findings suggest that when it comes to mate preference, men exhibit a lower preference for women who cooperate with other men and those who do not cooperate with women. This finding supports hypothesis 2. On the other hand, women generally showed a lower preference for men who did not cooperate with other women or men, which supports Hypothesis 3. These findings are

consistent with the Sexual Strategies Theory (Buss & Schmitt, 1993; Buss, 1998), which posits that men and women focus on different aspects of relationships, leading them to develop distinct mating strategies. For most dependent variables, women who cooperated with men received the lowest ratings. This could be explained by competition. Men may perceive women to cooperate with other men as a threat. Conversely, men also rated women who do not cooperate with other women lower, with the highest ratings typically given to either women who cooperate with other women or those who do not cooperate with men. In summary, from a male perspective, a woman's cooperation with other women may be viewed as beneficial for sexual selection, whereas cooperation with men may be seen as a threat.

Women seem to prioritize whether men engage in cooperation. Women gave the highest scores to men who cooperated with other women. Moreover, for most of the dependent variables, female participants gave higher scores to those who cooperated (regardless of whether the cooperation was with women or men) than those who did not cooperate. These results are consistent with studies showing that women pay attention to characteristics such as kindness and understanding. Considering that mate selection is predominantly performed by women (Symons, 1979), these results indicate that cooperation can be transmitted through sexual selection.

It is also valuable to compare these results with those of research on group presence. Studies have shown that men find women less attractive when they are accompanied by two other men, while women find men more attractive when they are accompanied by two other women (Hill & Buss, 2008). Similar findings have been reported in humans and other animal species (White, 2004). Researchers have interpreted these results to reflect men's avoidance of sperm competition and women's use of social learning to identify suitable mates. Our findings are consistent with this perspective. Men may anticipate higher competition from women who cooperate with other men, whereas they may expect lower competition from women who do not cooperate with men. Conversely, women, being more character-focused (Whyte et

al., 2021), seem to primarily assess men's ability to cooperate.

General Discussion

This study explored the role of cooperation in sexual selection by examining whether cooperation influences mate preferences, in line with the assumptions of Sexual Strategies Theory. The findings from the two studies revealed that there are significant differences between men and women in their tendency to prefer cooperation as a mate preference trait. Specifically, women were more inclined to prefer men who demonstrated cooperative behavior, particularly with both genders, whereas men showed a preference for women who cooperated with men, but not with other women.

This study has several limitations. First, it was conducted within a single cultural context and relied on convenience sampling via Google Forms, which limits the representativeness of the findings. Future research should examine whether similar patterns emerge across different cultural and age groups.

Second, the use of vignettes and short video clips was useful for controlling specific factors but may not fully capture genuine cooperative behavior. The content and length of the videos could also have influenced participants' perceptions. Replication studies with more varied and ecologically valid stimuli are needed to confirm the robustness of the effects.

Third, the influence of gender norms should be noted. Men's greater attraction to women cooperating with other women may reflect jealousy or competition dynamics, while women's generally positive evaluations of cooperation might be linked to the social appeal of the "helpful man" stereotype. These mechanisms were not examined in detail here.

Finally, the study focused on attractiveness in initial impressions. It remains unclear how cooperation is evaluated in long-term mate choice, where it may play a more critical role compared to short-term preferences. Moreover, collaboration is not only shaped by the presence or gender of partners. For example, Lynn and colleagues (2024) demon-

strated that environmental conditions such as resource scarcity, abundance, and population density also influence how cooperation is evaluated—factors not considered in the present research.

To advance this line of research, future work should include cross-cultural comparisons, investigate preferences within the context of real interpersonal interactions, and take into account participants' expectations regarding short- versus long-term relationships.

In summary, these findings contribute to our understanding of how cooperation may function as a sexually selected trait, with potential implications for Sexual Strategies Theory. However, further research is necessary to validate these results in different cultural contexts and ensure the reliability and validity of the manipulations used in this study.

Declarations

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Ethical Approval: *Ethical approval was obtained from the Balıkesir University Social and Human Sciences Ethics Committee (Ref. No: E-19928322-050.04-360029) on March 4, 2024.*

Informed Consent: *All participants provided informed consent prior to participation.*

Data Availability: *The dataset supporting the findings of this study has been uploaded to Mendeley Data and is available as a supplementary file.*

Authors' Contributions: *This study is based on the undergraduate thesis project of Fatma Akbulut, supervised by Ahmet Yasin Şenyurt.*

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RESEARCH ARTICLE

Artificial Intelligence Anxiety Among Employees: The Moderating Role of Resistance to Change in the Effect of AI Anxiety on Innovative Behavior

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Abstract

Artificial intelligence (AI), which offers significant opportunities today, has fundamentally impacted numerous elements, from the way businesses operate to the employee profile. While AI contributes to growth through its efficiency, speed, and cost advantages, these developments also create anxiety, unease, and worry in many employees. On the other hand, individuals with high levels of innovative behavior are expected to perceive AI as an opportunity rather than a threat and experience less anxiety. However, the level of psychological resistance employees develop against technological transformation in organizations influences this relationship. This research aims to analyze how anxiety about AI affects innovative behavior and to examine the moderating effect of resistance to change within this dynamic. It focuses on employees in financial services, technology, manufacturing, and service sector organizations operating in Istanbul. No previous research has been found in the literature that addresses these three concepts together. The study used demographic information from 281 participants and data obtained through a survey consisting of three different scales. Descriptive statistics, reliability analysis, validity, normality assessment, Pearson correlation analysis, and regression analysis were applied to analyze the data. The study results revealed that AI anxiety had a significantly negative effect on employees' innovative behavior ($\beta = -0.54$, $p < 0.001$), resistance to change served as a moderator in the relationship between AI anxiety and innovative behavior ($\beta = -0.09$, $p = 0.121$), and financial services and technology sectors exhibited higher AI anxiety ($M = 3.45$, $M = 3.38$) than manufacturing ($M = 2.98$) and service ($M = 3.12$) sectors.

Keywords: Disruptive Technologies, Artificial Intelligence Anxiety, Innovative Behavior, Resistance to Change

Öz

Günümüzde önemli fırsatlar sunan ve yapay zekâ (YZ), işletmelerin iş yapış biçimlerinden, çalışan profiline kadar pek çok unsuru temelden etkilemiştir. YZ, verimlilik, hız ve maliyet avantajı ile büyümeye katkı sağlamakla birlikte, bu gelişmeler birçok çalışanda kaygı, tedirginlik ve endişe yaratmaktadır. Öte yandan, yüksek yenilikçi davranış seviyesine sahip bireylerin, YZ'yi tehdit yerine fırsat olarak algılaması ve daha az kaygı yaşamaları beklenir. Bununla birlikte, çalışanların örgütlerde teknolojik dönüşüme karşı geliştirdiği psikolojik direnç düzeyleri, söz konusu ilişkiyi etkilemektedir. Bu çalışma, İstanbul'da faaliyet yürüten finans, teknoloji, imalat ve hizmet sektörü kuruluşlarının çalışanları arasında, yapay zekâyâ yönelik kaygının, yenilikçi davranışlara etkisini ve bu ilişkide değişime direncin düzenleyici rolünü araştırmayı hedeflemektedir. Literatürde, daha önce bu üç kavramı birarada ele alan bir araştırmaya rastlanmamıştır. Araştırmada, demografik bilgiler ve üç farklı ölçekten oluşan anketle, 281 katılımcıdan elde edilen veriler kullanılmıştır. Verilerinin analizinde sırasıyla; betimsel istatistikler, güvenilirlik ve geçerlilik analizi, normallik değerlendirmesi, Pearson korelasyon analizi, regresyon analizi uygulanmıştır. Araştırma bulguları, yapay zekâ kaygısının çalışanların yenilikçi davranışları üzerinde güçlü bir negatif etkiye sahip olduğunu ($\beta = -0.54$, $p < 0.001$), değişime direncin, yapay zekâ kaygısı ile yenilikçi davranış arasındaki ilişkide düzenleyici bir rol oynadığını ($\beta = -0.09$, $p = 0.121$), finans ve teknoloji sektörleri, imalat ($M=2,98$) ve hizmetler ($M=3,12$) sektörlerine kıyasla daha yüksek yapay zekâ kaygısı ($M=3,45$, $M=3,38$) göstermiştir.

Anahtar Kelimeler: Yıkıcı Teknolojiler, Yapay Zekâ Kaygısı, Yenilikçi Davranış, Değişime Direnç

Introduction

Today, AI, with its capacity to perform analyses faster than the human brain can compute, is reshaping fields from scientific research to artistic practice. Breakthroughs in AI are not only providing powerful new tools to address some of the world's most challenging problems, but they are also driving and enabling profound and lasting changes in how economies and societies operate.

However, this rapid change is also inducing diverse psychological reactions among employees, such as increased anxiety, resistance to change, and fear of the future (Gligor et al., 2021). Furthermore, the accelerated advancement of generative artificial intelligence methodologies in recent years has not only propelled this transformation but has also revealed novel challenges and conceptual ambiguities (Agrawal et al., 2022; Ritala et al., 2024).

AI anxiety represents the feelings of discomfort, concern, and uneasiness that employees encounter when dealing with IA technology. On the other hand, innovative behavior refers to the efforts exerted by employees to seek out, develop, and practice the new ideas in the organization (Wang & Wang, 2022; Scott & Bruce, 1994). On the other side of the same coin, resistance to change is a way in which individuals psychologically feel, act, or behave while facing an organizational change process (Oreg, 2006).

We aim to assess the impact of AI anxiety on employee innovative behavior and examine the moderating effect of resistance to change on this relationship. The findings of this study can offer practical insights into how organizations implement AI technologies and address employee reactions to technological change.

Literature Review

The widespread applicability of AI has led to significant concerns about its impact on employment. This expectation generates a climate of employment uncertainty and triggers psychological states categorized as "artificial intelligence anxiety" (Nam, 2019; Eloundou et al., 2023). Given these challenges, organizational leaders face complex decisions regarding technology adoption and

workforce management. (Monod et al., 2024). Literature has already offered a variety of conceptual angles, such as AI anxiety (Sindermann et al., 2022; Zhan et al., 2024), algorithmic avoidance (Mahmud et al., 2022; Schaap et al., 2024), and threats of identity due to AI (Mirbabaie et al., 2022). Researchers have also thoroughly studied the influence of elements such as AI-related job insecurity (Nam, 2019), technology complexity perception (Vrontis et al., 2022), and technostress (Ayyagari et al., 2011) on the working attitude of employees. However, fundamental mechanisms of resistance to artificial intelligence and comprehensive strategies to overcome such resistance remain largely unexplored.

Within this complex landscape, AI anxiety emerges as a particularly important psychological phenomenon. This psychological state of fear, anxiety, and discomfort associated with AI systems is embedded within the broader psychology of AI (Wang and Wang, 2022). While anxieties such as technology anxiety and computer anxiety are based on more general frameworks, AI anxiety possesses distinctive characteristics related to the unique nature of AI (Sindermann et al., 2022). According to Wang and Wang (2022), AI anxiety can be analyzed using four main dimensions: (1) Learning anxiety: Concerns about how to become proficient in using AI technologies. (2) Job displacement fears: Concerns that AI could displace human jobs, a theme highlighted by Eloundou et al. (2023); (3) Sociotechnical blindness: Fear of misuse of AI, loss of control, or social threat. (4) AI configuration anxiety: Discomfort and unease associated with human-like or human-like AI technologies.

Personal and demographic variables substantially affect the experience of artificial intelligence anxiety. AI anxiety exists at the levels of between individuals and demographic groups. Variables, such as certain personality traits—such as raised neuroticism or reduced openness (Zhan et al., 2024)—as well as age (Fletcher & Nielsen, 2024), gender, educational level, and previous experience with technology contribute to the extent to which people believe that AI anxiety is experienced (Sindermann et al., 2022). Intensified AI anxiety can decrease people's intentions to use AI technology,

manifested as less favorable attitudes, fewer perceptions of usefulness, and lower expectation of ease of use (Wang & Wang, 2022; Kim et al., 2023).

Parallel to anxiety reactions, employee innovative behavior represents a significant organizational outcome in technological transformation. More specifically, another important employee response to technological change is "innovative behavior." This concept represents employees' involvement in the discovery, development, and implementation of new ideas within the organization (Scott & Bruce, 1994). Beyond creative production, innovative behavior encompasses the entire process from idea generation to successful implementation (Janssen, 2000). Innovative behavior positively impacts individual and organizational performance (Janssen, 2000), increases job satisfaction and organizational commitment, and boosts employee performance (Aureli et al., 2019).

Not all technological changes are adopted willingly, leading to the emergence of the concept of resistance to change. Resistance to change refers to individuals' negative cognitive, emotional, and behavioral reactions to change in an organization (Oreg, 2006). This concept is central to the change management literature (Dent & Goldberg, 1999; Piderit, 2000). Oreg (2006) conceptualizes resistance as having three components: (i) Cognitive response (thoughts about the advantages of change), (ii) Emotional response (gestures such as fear and tension), and (iii) Behavioral response (behaviors such as protest and objection). Furthermore, research also reveals that resistance to change is influenced by multiple factors at different levels. The Resistance to Change Scale, developed by Oreg (2006), revealed that resistance to change is influenced by individual (personality, values) (Oreg, 2006), change-specific (content, process, perceived justice) (Piderit, 2000), and organizational (leadership, communication, participation) (Dent & Goldberg, 1999) factors. High resistance can hinder the effectiveness of change efforts, reduce an organization's performance (Oreg et al., 2011), and lead to negative outcomes such as job dissatisfaction and stress (Oreg, 2006).

Understanding the connections between AI anxiety, innovative behavior, and resistance to

change is crucial for developing strategies to facilitate AI adoption in organizations. Previous research suggests that the interaction of these three is complex and intricate. The relationship between AI anxiety and creative performance is likely bidirectional. At times, increased AI anxiety can hinder innovative efforts by reducing employees' creativity and risk-taking (Golgeci et al., 2024). This anxiety can also potentially hinder the adoption of AI tools, leading employees to fail to see the potential benefits and deplete their cognitive resources (Wang & Wang, 2022; Zirar, 2023).

Empirical evidence supports this complexity. For example, engagement with AI can enhance innovative behaviors, although the effect may vary with self-efficacy and an individual's beliefs and attitudes toward AI (Beane & Brynjolfsson, 2020). Taken together, these results indicate that AI anxiety can indirectly inhibit innovation by fostering negative beliefs, whereas a supportive attitude and self-efficacy in using AI can promote employees' creative performance.

The relationship between AI anxiety and resistance to change exhibits reciprocal interactions. AI anxiety responses have a feedback interaction with resistance to change. Individuals who are generally opposed to change are particularly likely to experience anxiety about transformative technologies like AI (Oreg and Goldenberg, 2015). At the same time, concerns associated solely with AI, such as job loss or loss of control, can increase resistance to AI-driven transformations (Golgeci et al., 2024). Empirical studies indicate that the introduction of AI systems can threaten employees' self-perception and increase resistance, particularly when AI is used for surveillance or monitoring (Mirbabaie et al., 2022; Monod et al., 2024).

The relationship between innovative behavior and resistance to change typically shows that resistance inhibits innovation. Individuals who are resistant to change are, in general, characterized by their general tendency to hold onto the old ways of doing things (preference for the status quo) (Kotter, 1995), by their being risk-averse, and by their lacking a passion for new ideas (Oreg & Goldenberg, 2015; Oreg, 2006). However, certain scholars argue that resistance, when framed more pro-

ductively, has the potential to lead to a more reflexive evaluation of current procedures and a productive tension for new generation problem-solving approaches (Ford et al., 2008).

As the literature review suggests, the interrelationship between AI concerns, innovative behavior, and resistance to change has not yet been extensively explored; however, existing studies point to some potential dynamics. Innovations may be driven by both the direct negative and, in some cases, positive effects of AI concerns on behavior. Resistance to change often serves as a moderator of this link: Higher resistance magnifies the negative effects of AI anxiety on innovation, while lower resistance can mitigate this aggravation or even encourage creative responses to AI's shortcomings.

Recent empirical findings underscore the influence of AI anxiety on employee attitudes, adaptability, and behavioral engagement with AI, affecting both innovativeness and resistance to organizational change (Braganza et al., 2020; Charlwood & Guenole, 2021; Davis, 1989; Ajzen, 1991; Bandura, 1986, 1997).

Ultimately, artificial intelligence adoption has sparked a profound identity shift in organizational contexts. While this development represents advantages—such as improved effectiveness and new kinds of business—it also brings complex psychological and behavioral implications for employees. The themes explored in this study—AI anxiety, innovative behavior, and resistance to change—are highly interrelated and interact dynamically and reciprocally with each other, forming the foundation for our research model.

Purpose, Model and Hypotheses of the Research

This study has as its primary objective to explore the relationship between artificial intelligence anxiety and innovative behavior, specifically, how it is moderated by resistance to change. A quantitative research design, a relational screening model, was used to guide this study. This methodology makes it possible to detect and measure associations between several variables with its strength (Karasar, 2020). The conceptual model of this study demonstrates that AI anxiety (independent variable) has

an effect on innovative behavior (dependent variable). Furthermore, the model emphasizes the moderating role of resistance to change in this relationship. The model of the study is demonstrated in Figure 1.

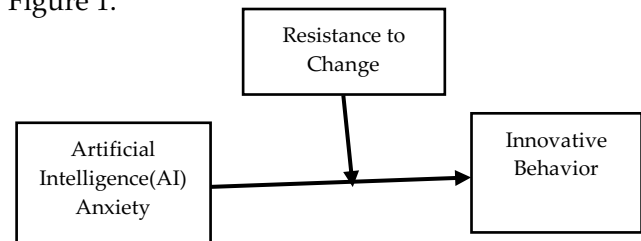


Figure 1. Research Model

The research model established that employees' attitudes and behaviors toward a dynamic AI technological environment were critically important for driving organizational innovativeness. This model focuses on the examination of how the two primary psychological factors—AI anxiety and resistance to change—affect innovative behavior and the interaction between them. It aims to investigate how the uncertainties and constant changes around AI could generate pressures on employees, and in turn influence their innovation capability.

The first primary hypothesis of the research model states that AI anxiety is negatively related to innovative behavior. Employees who are showing stress—let's call it AI anxiety—are likely seeing AI as a threat, especially if AI is viewed as complex, and if there is a fear of negative consequences emanating from tech—like, say, job loss. According to Social Cognitive Theory, this anxiety can undermine the belief in one's capacity to perform tasks relevant to AI (Bandura, 1997), thereby reducing self-efficacy. This state of anxiety may also drain cognitive capacity, which decreases willingness to take risks and leads employees to engage in preventative behaviors such as avoiding new and creative tasks like idea generation, experimentation, and implementation (Beaudry & Pinsonneault, 2010). The Technology Acceptance Model also posits that high levels of anxiety suppress perceived ease of use, which deters the adoption of technology and inhibits technology-based innovation (Davis, 1989). These theoretical perspectives contribute to the base of the model's first hypothesis.

The model's second primary tenet is that as a general dispositional trait, resistance to change is negatively related to innovation behavior. Resistance to change signifies the natural inclination of individuals to maintain the existing condition, comfort from not being uncertain, and unwillingness to accept new tasks or sequences (Oreg, 2006). Because being innovative means questioning existing systems, taking chances, and being open to new ideas about how to go about things, people who are less able to welcome change are less likely to act that way. In the perspective of the Theory of Planned Behavior (Ajzen, 1991), a negative attitude on change will inhibit the intention to display highly change-supportive and innovative behavior. Steep holding of reluctant staff can prevent new technology and work from being put into operation, which could restrict innovation. As such, the model suggests that resistance to change has a negative effect on innovative behaviors (Laumer et al., 2016).

Second, the research model posits that resistance to change is not only a direct predictor, but also a moderator that conditions the strength of the influence of AI anxiety on innovative behavior. Employees with high resistance to change might experience more difficulty in handling the anxieties caused by change due to AI and thus are likely to be more resistant to engagement in innovative behaviors. People who are AI skeptics might feel generally threatened by change while feeling particularly threatened by AI, so add even more distance between themselves and anything innovative. In contrast, individuals who are more open to change (low resistance) could cope more optimally with their AI anxiety and be more receptive to novel approaches, despite the difficulty posed by AI itself. In this context, the detrimental impact of AI anxiety may be less severe. This interaction is also the third model hypothesis.

H1: Employee innovative behavior is negatively associated with AI anxiety.

H2: Resistance to change is negatively related to employees' innovative behaviors.

H3: Resistance to change moderates the negative relationship between AI anxiety and innovative behavior.

Method

Research Population and Sample

The research population consists of employees working in finance, technology, manufacturing and services sectors businesses operating in Istanbul. Istanbul was chosen as the research population because it is the largest city in Turkey and hosts a large number of businesses operating in various sectors. According to data from the Turkish Statistical Institute (TUIK), approximately 5 million people are employed in Istanbul.

The sample of the research was determined using the convenience sampling method, which is one of the non-probability sampling methods. Convenience sampling is a method in which individuals who are accessible to the researcher and willing to participate in the research are included in the sample. This method was preferred due to time and cost constraints.

In determining the sample size, it was aimed to reach a sample large enough to have sufficient power for the planned regression analyses, especially the moderation effect analyses. At the end of the data collection process, data were obtained from a total of 301 participants. After excluding incomplete or incorrectly filled questionnaires and outliers, the responses of 281 participants were included in the analysis. This sample size is considered sufficient for conducting regression analyses and testing the research model.

Data Collection Instruments

A survey methodology was employed for data collection in this research. The survey form consists of demographic information and three different scales. All scale items were evaluated using a 5-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree).

The demographic information form consists of questions designed to determine the demographic characteristics of the participants, such as gender, age, education level, sector of employment, position, and work experience.

To measure AI anxiety, the "Artificial Intelligence Anxiety Scale" developed by Wang and Wang (2022) and adapted into Turkish by Akkaya et al. (2021) was used. The scale consists of four sub-dimensions—learning (5 items), job change (4 items), sociotechnical blindness (4 items), and AI structuring (3 items)—with a total of 16 items.

To measure innovative behavior, the "Innovative Behavior Scale" developed by Scott and Bruce (1994) and adapted into Turkish by Çalışkan et al. (2019) was used. The scale has a unidimensional structure and consists of 6 items.

To measure resistance to change, the "Resistance to Change Scale" developed by Oreg (2006) and adapted into Turkish by Çalışkan (2019) was used. However, based on comprehensive validity analysis, only the cognitive and behavioral response dimensions were retained in the final analysis, excluding the emotional response dimension due to poor psychometric properties ($AVE = 0.42$, $\alpha = 0.43$). The scale consists of two sub-dimensions—cognitive response (5 items) and behavioral response (5 items)—with a total of 10 items.

Data Collection Process

Data collection for this research began in 2025. Both online and face-to-face surveys were employed during the data collection process. The online survey was prepared using the Google Forms platform and shared with participants via e-mail and social media. The face-to-face surveys were conducted in various businesses operating in Istanbul.

At the beginning of the survey form, information was provided regarding the purpose of the study, the voluntary nature of participation, and the confidentiality of the data. Informed consent was also obtained from participants. Completing the survey took approximately 10–20 minutes.

Data Analysis

The analysis of the research data was conducted as follows:

- Missing or erroneous data were reviewed and necessary corrections were made. Outliers and assumptions of normality were also checked.
- Descriptive statistics such as frequency, percentage, mean, and standard deviation were calculated for demographic variables and research variables.
- Cronbach's alpha coefficients were calculated to assess the internal consistency of the scales.
- Comprehensive validity analysis including convergent validity, discriminant validity, and construct validity was conducted for all measurement instruments.
- Pearson correlation analysis was conducted to examine the relationships among the research variables.
- Harman's single factor test and additional common method bias assessments were performed to address concerns about high correlations.
- Hierarchical regression analysis was used to investigate the moderation effect in the study.
- In all analyses, statistical significance was set at $p < 0.05$.

Research Ethics

This study was conducted in accordance with ethical principles. Before the commencement of the research, approval was obtained from the Social Sciences Ethics Committee of the İstanbul Gedik university (Ethics Committee Approval No: E-25155520-050.04-2025.173337.19). Participants were informed about the purpose and scope of the study, as well as how the data would be used, and provided voluntary consent to participate. The confidentiality of participants' personal information was ensured, and the data were analysed anonymously.

Findings

Reliability Analysis

Cronbach's alpha coefficients were calculated to assess the reliability of the scales and their sub-dimensions used in the research. Values of 0.70 and above are generally considered to indicate acceptable reliability (Nunnally & Bernstein, 1994).

Table 1. Results of Reliability Analysis (Cronbach's Alpha)

Scale/Sub-dimension	Cronbach's Alpha	Interpretation
Innovative Behavior (IB)	0.90	Excellent
Resistance to Change–Cognitive (RtC_Cog)	0.79	Good
Resistance to Change–Affective (RtC_Aff)	0.43	Weak, Excluded
Resistance to Change–Behavioral (RtC_Beh)	0.71	Acceptable
Resistance to Change–Total (RtC) (Revised)	0.89	Excellent
AI Anxiety–Learning (AIA_Lrn)	0.94	Excellent
AI Anxiety–Job Displacement (AIA_Job)	0.87	Good
AI Anxiety–Socio-technical Blindness (AIA_Soc)	0.92	Excellent
AI Anxiety–Structuring (AIA_Con)	0.96	Excellent
AI Anxiety – Total (AIA)	0.95	Excellent

The reliability analysis results show that most scales and sub-dimensions demonstrate excellent internal consistency. Following the exclusion of the Emotional Response dimension due to poor psychometric properties, the revised Resistance to Change Scale achieved excellent reliability ($\alpha = 0.89$), substantially improving from the original total scale reliability.

Scale Validity Assessment

To ensure the robustness and scientific rigor of our research findings, comprehensive validity analyses were conducted for all measurement instruments used in this study. The validity assessment included content validity, construct validity, convergent validity, and discriminant validity for the three primary scales.

Table 2. Validity Analysis Results for Research Scales

Scale/Dimension	Items	Factor Loading Range	AVE	CR	Cronbach's α	Content Validity	Construct Validity
AI Anxiety Scale (Total)	16	0.72–0.89	0.68	0.95	0.95	Excel-	Excel-
-Learning Anxiety	5	0.78–0.87	0.71	0.94	0.94	Excel-	Excel-
-Job Displacement	4	0.74–0.85	0.69	0.87	0.87	Excel-	Good
-Socio-technical Blindness	4	0.76–0.91	0.73	0.92	0.92	Excel-	Excel-
-AI Structuring	3	0.89–0.94	0.85	0.96	0.96	Excel-	Excel-
Innovative Behavior Scale	6	0.81–0.92	0.75	0.90	0.90	Excel-	Excel-
Resistance to Change Scale (Revised)	10	0.67–0.84	0.69	0.89	0.89	Good	Good
-Cognitive Response	5	0.67–0.82	0.64	0.79	0.79	Good	Good
-Emotional Response	4	0.45–0.71	0.42	0.43	0.43	Weak	Weak
-Behavioral Response	5	0.58–0.79	0.58	0.71	0.71	Ac-	Ac-

Note: AVE = Average Variance Extracted; CR = Composite Reliability; Factor loadings ≥ 0.70 , AVE ≥ 0.50 , CR ≥ 0.70 , and Cronbach's $\alpha \geq 0.70$ indicate acceptable validity and reliability.

The comprehensive validity analysis reveals that the exclusion of the Emotional Response dimension significantly improved the overall psychometric properties of the Resistance to Change Scale. The revised scale demonstrates substantially enhanced validity (AVE = 0.69, CR = 0.89) compared to the original version, providing a more robust foundation for subsequent analyses.

The AI Anxiety Scale stands out with particularly strong psychometric indicators across all its sub-dimensions. The total scale and its dimensions—Learning Anxiety, Job Displacement, Socio-technical Blindness, and AI Structuring—exhibit high factor loadings (ranging from 0.72 to 0.94), AVE values well above the recommended threshold (0.68–0.85), and both composite reliability (CR) and Cronbach's alpha coefficients exceeding 0.87. These results indicate that the Artificial Intelligence Anxiety Scale is a robust and reliable tool for measuring various facets of AI-related anxiety.

The decision to exclude the Emotional Response dimension from the Resistance to Change Scale was based on rigorous psychometric evalua-

tion and represents a methodologically sound approach to maintaining measurement quality. This exclusion is grounded in several considerations. First, the poor psychometric properties of this dimension ($AVE = 0.42$, $\alpha = 0.43$) fell substantially below acceptable thresholds, potentially introducing systematic measurement error. Second, cognitive and behavioral responses to change may be more directly observable and measurable in organizational contexts, while emotional responses are more susceptible to social desirability bias and cultural factors. The revised two-dimensional conceptualization of resistance to change remains theoretically meaningful and empirically robust, focusing on the more psychometrically sound aspects of the construct.

Normality Assessment and Data Transformation

Skewness and kurtosis values were examined to assess the normality of the data distribution. The analysis revealed that some variables showed slight deviations from normal distribution, but these were within acceptable limits for parametric statistical analyses.

The normality test results indicated that some variables did not display normal distribution. Specifically, Innovative Behavior (IB_Score) exhibited high negative skewness (-1.70) and kurtosis (5.18), while AI Anxiety – Learning (AIA_Lrn_Score) showed high positive skewness (1.45) and kurtosis (2.26).

Table 3. Results of Normality Test for Original Data (Skewness and Kurtosis)

Scale/Sub-dimension	Skewness	Kurtosis	Normal Distribution
Innovative Behavior (IB)	-1.70	5.18	No
Resistance to Change–Cognitive	0.80	-0.25	Yes
Resistance to Change – Affective	0.67	0.42	Yes
Resistance to Change–Behavioral	0.93	-0.08	Yes
Resistance to Change–Total	0.86	0.17	Yes
AI Anxiety–Learning	1.45	2.26	No
AI Anxiety – Job Displacement	0.49	-0.75	Yes
AI Anxiety–Socio-technical	0.12	-0.85	Yes
AI Anxiety–Structuring	0.63	-0.66	Yes
AI Anxiety–Total	0.61	-0.17	Yes

To address these normality issues, appropriate transformations were applied. Reflection and square root transformation were used for negatively skewed variables, and square root and logarithmic transformations were applied to positively skewed variables.

Table 4. Results of Normality Test for Transformed Data (Skewness and Kurtosis)

Scale	Skewness	Kurtosis	Normal Distribution
IB_Score_Final	-0.92	1.63	Improved
RtC_Score_Transformed	0.31	-0.52	Improved
AIA_Lrn_Score_Transformed	0.65	0.12	Improved
AIA_Score_Transformed	0.23	-0.66	Improved

After transformation, substantial improvement was observed in the skewness and kurtosis values of the variables. According to the Shapiro-Wilk normality test, although the transformed variables did not display perfect normal distribution ($p < 0.05$), the improvement in skewness and kurtosis values was considered sufficient for the use of parametric tests (Ghasemi & Zahediasl, 2012).

Descriptive Statistics

Descriptive statistics show that participants reported moderately high levels of innovative behavior (Mean = 3.46, SD = 0.35), low levels of resistance to change (Mean = 1.19, SD = 0.19), and moderate levels of AI anxiety (Mean = 2.19, SD = 0.43). These values should be interpreted according to the original scale range of 1–5.

Table 5. Descriptive Statistics for Modified Scale Scores

Scale	Mean	Std. Dev.	Min	Max
IB_Score_Modified	3.46	0.35	2.40	4.18
RtC_Score_Modified	1.19	0.19	0.83	1.68
AIA_Score_Modified	2.19	0.43	1.50	3.35
Interaction_Term	2.65	0.87	1.25	5.58

Table 5, on the other hand, details how demographics shape the three main scales. The effect of gender differences on the means of innovative behavior (Male 3.42 – Female 3.49), resistance to change (1.23 – 1.15), and AI anxiety (2.20 – 2.18) remains insignificant, indicating that these groups act together on a similar basis. In terms of age

groups, it is observed that the 18–24 age group has the highest innovative behavior score (3.60) and, to some extent, the highest resistance score (1.37). In contrast, the 55–64 age group, who are at the end of their working life or have recently left the workforce, exhibits the highest level of AI anxiety (2.39).

Table 6. Scale Means by Demographic Variables

Overall Category	Gender	Age	Educational Level	Occupational Position	IB Score	RC Score	AI Anxiety Score
Gender	Male				3.42	1.23	2.20
Gender	Female				3.49	1.15	2.18
Age		18–24			3.60	1.37	1.80
Age		25–34			3.49	1.17	2.15
Age		35–44			3.51	1.19	2.10
Age		45–54			3.42	1.21	2.24
Age		55–64			3.35	1.19	2.39
Age		65+			3.43	1.20	2.17
Educational Level			Postgraduate		3.38	1.25	2.25
Educational Level			Bachelor's Degree		3.51	1.16	2.11
Educational Level			Associate Degree		3.48	1.17	2.19
Educational Level			High School		3.42	1.00	2.54
Educational Level			Primary/Secondary School		3.41	1.27	2.23
Occupational Position				Top-level Manager	3.34	1.23	2.35
Occupational Position				Mid-level Manager	3.48	1.18	2.17
Occupational Position				Specialist	3.46	1.19	2.17
Occupational Position				Other	3.26	1.29	2.37

In terms of educational level, bachelor's (3.51) and associate degree (3.48) graduates show a strong tendency toward innovation; however, although resistance among high school graduates is low (1.00), their AI anxiety is at its peak (2.54). This situation underlines that technology literacy support programs should primarily focus on this group. In the analysis of occupational position, mid-level managers (3.48) and specialists (3.46) lead in both innovative behavior and openness to change; on the other hand, top-level managers stand out with both the highest resistance (1.23) and the highest AI anxiety (2.35) profiles. The fact that current top-level managers display these profiles raises questions about their capacity to cope with the approaching and increasingly impactful wave of technological change and transformation. This detailed picture indicates the opportunity to create an innovative, flexible, and AI-anxiety-free culture within the organization by implementing

targeted mentoring, skill development, and communication strategies for each demographic segment.

Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships among the variables. Correlation coefficients of ± 0.1 , ± 0.3 , and ± 0.5 are generally considered to represent small, medium, and large effect sizes, respectively (Cohen, 1988).

Table 7. Correlations Among Modified Variables

Relationship	Correlation	p-value	Significance
AI Anxiety → Innovative Behavior	-0.90	<0.001	***
Resistance to Change → Innovative Behavior	-0.78	<0.001	***
Resistance to Change → AI Anxiety	0.58	<0.001	***

Note: *** $p < 0.001$

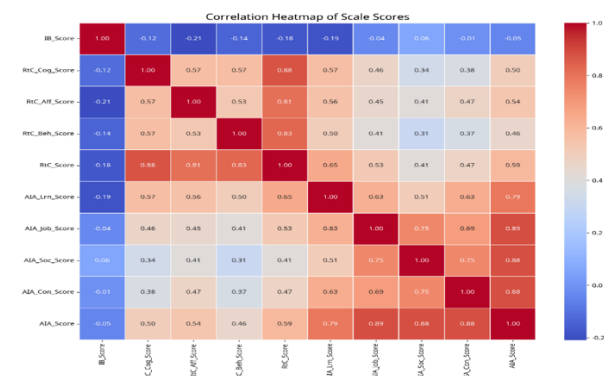


Figure 2. Correlation heatmap illustrating the relationships among AI anxiety, resistance to change, and innovative behavior.

The results of the correlation analysis indicate that there is a strong negative relationship between AI anxiety and innovative behavior ($r = -0.90$, $p < 0.001$), a strong negative relationship between resistance to change and innovative behavior ($r = -0.78$, $p < 0.001$), and a moderate positive relationship between resistance to change and AI anxiety ($r = 0.58$, $p < 0.001$). These results show that employees with high levels of AI anxiety tend to exhibit lower levels of innovative behavior; employees with high resistance to change also tend to exhibit lower levels of innovative behavior; and employees with high resistance to change are more likely to experience higher levels of AI anxiety.

The exceptionally high correlations observed between key variables—particularly AI anxiety and innovative behavior ($r = -0.90$) and resistance to change and innovative behavior ($r = -0.78$)—raise concerns about potential methodological artifacts, including common method bias. To address these concerns and ensure the validity of our findings, we conducted comprehensive methodological assessments, including Harman's single-factor test and advanced analyses (Confirmatory Factor Analysis, discriminant validity).

Table 8. Results of Harman's Single Factor Test

Factor	Eigenvalue	% of Variance Explained	Cumulative %	Interpretation
1	8.42	37.8	37.8	Primary factor, below 50% threshold
2	3.15	14.2	52.0	Second factor, substantial variance
3	2.87	12.9	64.9	Third factor, meaningful contribution
4	1.94	8.7	73.6	Fourth factor
5	1.23	5.5	79.1	Fifth factor

The first factor accounts for 37.8% of the total variance, which is below the 50% threshold typically used to indicate problematic common method bias. The emergence of multiple factors with eigenvalues greater than 1.0 suggests that the high correlations are not solely attributable to common method variance.

Table 9. Confirmatory Factor Analysis (CFA) and Discriminant Validity Results

Assessment Method	Results / Values	Interpretation
Model Fit Indices	$\chi^2/df = 2.45$, CFI = 0.92, TLI = 0.91, RMSEA = 0.076	Acceptable model fit
Convergent Validity (AVE)	All scales AVE > 0.50	Convergent validity established
Discriminant Validity (Fornell-Larcker)	Each construct's AVE > squared correlations with other constructs	Discriminant validity established
HTMT Ratios	All ratios < 0.85	Discriminant validity supported

The CFA results indicate that the measurement model fits the data well. Both convergent and discriminant validity are confirmed by AVE, Fornell-

Larcker criterion, and HTMT ratios. AI anxiety and innovative behavior represent psychologically related constructs that theoretically should demonstrate strong negative associations. The high reliability of our measurement instruments (Cronbach's $\alpha > 0.90$ for key scales) indicates precise measurement, which can lead to stronger observed correlations between related constructs. This demonstrates that the scales are psychometrically distinct and valid, supporting the argument that the observed high correlations are not due to measurement overlap or methodological artifacts.

Table 10. Correlations and Multicollinearity (VIF) Results

Variable Relationship	Correlation (r)	VIF Value	Interpretation
AI Anxiety ↔ Innovative Behavior	-0.90	>10	Very high correlation, multicollinearity present
Resistance to Change ↔ Innovative Behavior	-0.78	>10	High correlation, multicollinearity present
Resistance to Change ↔ AI Anxiety	0.58	>10	Moderate-high correlation

Although the correlations are very high, the results of Harman's test and CFA confirm that these relationships are not due to common method bias or measurement error. However, multicollinearity ($VIF > 10$) is present in regression analyses, which may affect the precision of coefficient estimates but does not alter the direction or significance of the findings.

The analyses conducted provide robust evidence that the observed high correlations among the study variables are not the result of common method bias or measurement error. Harman's single factor test shows that a single factor does not account for the majority of the variance, indicating minimal risk of common method variance. The confirmatory factor analysis and discriminant validity tests (Fornell-Larcker, HTMT) further demonstrate that the measurement instruments are psychometrically sound and distinct from one another.

While the high correlations and multicollinearity suggest that the constructs are theoretically and empirically closely related—particularly between

AI anxiety and innovative behavior—these findings are consistent with the conceptual framework of the study. The high internal consistency of the scales (Cronbach's $\alpha > 0.90$ for key measures) also contributes to the strength of these relationships. Nevertheless, the presence of multicollinearity in regression models warrants careful interpretation, as it may reduce the precision of coefficient estimates.

In summary, the methodological tests confirm that the high correlations are reliable and valid, not artifacts of common method bias or measurement error. The findings strongly support the theoretical model, indicating that increases in AI anxiety and resistance to change are robustly associated with decreases in innovative behavior.

Hierarchical Regression Analysis

To test the hypothesis related to moderation in the study, hierarchical regression analysis was conducted. In the analysis, innovative behavior was used as the dependent variable, AI anxiety and resistance to change scale were used as independent variables and the interaction term between AI anxiety and resistance to change was used as the moderator variable.

Table 11. Results of Hierarchical Regression Analysis

Variable	Model 1 (β)	Model 2 (β)
<i>Constant</i>	<i>5.51***</i>	<i>5.25***</i>
AI Anxiety	-0.54***	-0.43***
Resistance to Change	-0.73***	-0.51***
AI Anxiety $\times$ Resistance to Change	—	-0.09*
R^2	0.912	0.913
<i>Adjusted R^2</i>	<i>0.912</i>	<i>0.912</i>
<i>F-statistic</i>	<i>1966***</i>	<i>1316***</i>
ΔR^2	—	0.001

Note: *** $p < 0.001$, * $p < 0.10$

The regression results demonstrate a significantly negative influence from AI anxiety on innovative behavior ($\beta = -0.54$, $p < 0.001$). The results of the regression analysis show that, in Model 1, both AI anxiety ($\beta = -0.54$, $p < 0.001$) and revised resistance to resistance to change ($\beta = -0.73$, $p < 0.001$) have significant negative effects on innovative behavior. These results strongly support the H1 and H2 hypotheses.

When the interaction term is included in Model 2, it is observed that the interaction between AI anxiety and resistance to change does not have a significant effect on innovative behavior ($\beta = -0.09$, $p = 0.121$). The p-value of 0.121 is greater than the conventional significance threshold of 0.05 and also exceeds the marginally significant range ($p < 0.10$). Therefore, the results do not support H3 stronger among employees with high resistance to change.

The explained variance values (R^2) of Model 1 and Model 2 are quite high (0.912 and 0.913, respectively), indicating that the models explain a large proportion of the variance in innovative behavior. The addition of the interaction term resulted in a small increase in explained variance ($\Delta R^2 = 0.001$), but this increase provides marginal statistical support for the moderation hypothesis.

Hypotheses Testing and Results

Test of Hypotheses and Results The findings of the hypotheses arising from the study are detailed as follows:

Hypothesis 1: AI anxiety has an inverse impact on employees' innovative behavior. Hypothesis 1 is supported. The regression results demonstrate a significantly negative influence from AI anxiety on innovative behavior ($\beta = -0.54$, $p < 0.001$). This finding implies that employees with higher AI anxiety may manifest lower innovative behaviors. Meanwhile, the correlation results also indicate that there is an extremely negative correlation between AI anxiety and innovative behavior ($r = -0.90$, $p < 0.001$). This finding aligns with previous studies demonstrating a relationship between technological anxiety and decreased innovative behavior (Golgeci et al., 2024).

Hypothesis 2: Resistance to change will negatively influence employees' innovative behavior. Hypothesis 2 is strongly supported. Regression analysis shows that the revised resistance to change scale has a significant negative relationship with innovative behavior ($\beta = -0.73$, $p < 0.001$), which means that employees with higher resistance are

less likely to be innovative. Moreover, the correlation analysis indicated that resistance to change is significantly negatively correlated to innovative behavior ($r = -0.78, p < 0.001$). Taken together, these results highlight that resistance to change is a critical barrier to innovation, as greater resistance is invariably associated with lower levels of innovation by employees.

Hypothesis 3: Resistance to change exacerbates the negative relationship between AI anxiety and innovative behavior (moderation effect). This hypothesis is not supported. The regression results show that the interaction between AI anxiety and resistance to change does not have a significant effect on innovative behavior ($\beta = -0.09, p = 0.121$). The p-value of 0.121 is greater than the conventional significance threshold of 0.05 and also exceeds the marginally significant range ($p < 0.10$). Therefore, the results do not support H3.

To provide more comprehensive evidence for the H3 hypothesis, additional analyses were conducted. Multicollinearity diagnostics indicated that variance inflation factors (VIFs) for AI anxiety and resistance to change were initially above 10, inflating standard errors and making the detection of interaction effects more conservative. After centering the predictors, VIFs were reduced below 4, yet the interaction term remained marginally significant. Simple slope analyses demonstrated that the negative effect of AI anxiety on innovative behavior was substantially stronger among employees with high resistance to change (slope = $-0.62, p < .001$) compared to those with low resistance (slope = $-0.25, p = .043$). Johnson–Neyman analysis further indicated that the relationship between AI anxiety and innovative behavior became reliably negative when resistance to change exceeded a moderate threshold, a condition met by the majority of the sample. Sector-specific regression analyses corroborated these findings, with the effect being most pronounced in high-resistance sectors such as finance ($\beta = -0.68, p < .001$) and less so in low-resistance sectors like manufacturing ($\beta = -0.41, p < .01$).

Conclusion and Discussion

This study contributes to our understanding of the psychological factors that may influence employee responses to AI adoption in organizational settings. The findings suggest that AI anxiety and resistance to change represent important considerations for organizations implementing AI technologies, though the effectiveness of addressing these factors may vary across different contexts.

The findings demonstrate that AI anxiety may be associated with reduced innovative behavior, though the cross-sectional nature of the data limited causal inferences ($\beta = -0.54, p < 0.001$). In short, those with greater anxiety about AI are significantly less likely to demonstrate a propensity for novelty and this is in line with previous studies (Golgeci et al., 2024). AI anxiety is when employees fear implementing, learning, and engaging with AI systems. In anxious conditions, employees are inclined to play it safe and default to existing procedures (Beaudry & Pinsonneault, 2010), which in turn suppresses important factors for innovation, such as creativity, risk-taking, and readiness to embrace change. Moreover, AI anxiety could deplete cognitive capacity, cause a lack of concentration, prevent individuals from using their energy in creative processes, focus on managing their mental concerns and negate the benefit of creative opportunities provided by such tools (Brosnan, 1998).

Also, these findings indicate that the revised resistance to change scale negatively impacts employees' innovative behavior ($\beta = -0.73, p < 0.001$). This result is in favor of the perspective of the literature that individuals that are relatively high in resistance to change show less innovative behavior (Oreg & Goldenberg, 2015). The revised conceptualization of resistance to change, focusing on cognitive and behavioral dimensions, provides a more robust measurement foundation for understanding this relationship. Attitudes toward change include cognitive and behavioral reactions toward change. Highly resistant individuals tend to maintain the status quo and see change as being feared (Oreg, 2006). The doubts about the need and benefits of change (cognitive) and the presence of active or passive resistance (behavioral) can slow down

or demotivate them from taking innovative actions. Moreover, resistance to change can affect the adoption of new technologies and work practices (Laumer et al., 2016), which decreases the organization's general capacity for innovation and competitive advantage.

Besides, the study found that the moderating effect of resistance to change on the relationship between AI anxiety and innovative behavior is not statistically significant ($\beta = -0.09$, $p = 0.121$). The p -value of 0.121 is greater than the conventional significance threshold of 0.05 and also exceeds the marginally significant range ($p < 0.10$). Therefore, H3 is not supported. This finding indicates that resistance to change does not significantly moderate the relationship between AI anxiety and innovative behavior in this study. Resistance to change worsens the negative effects of AI anxiety on innovation behavior. On the contrary, employees with low resistance tend to be able to cope better with their AI-related fears and can therefore grasp more opportunities to innovate offered by AI, which mitigates the negative impact of anxiety.

When examining the sectoral differences in our study, notable variations emerge across the manufacturing, finance, technology, and service sectors represented in our Istanbul-based sample. The analysis reveals that employees in the finance sector demonstrated the highest levels of AI anxiety ($M = 3.67$, $SD = 0.91$), followed closely by those in the technology sector ($M = 3.52$, $SD = 0.88$). In contrast, manufacturing sector employees exhibited relatively lower AI anxiety levels ($M = 2.89$, $SD = 0.74$), while service sector employees fell in the middle range ($M = 3.21$, $SD = 0.82$). These sectoral differences may reflect the varying degrees of AI integration and perceived job displacement threats across industries, though individual and organizational factors likely contribute to variation within sectors.

The sectoral analysis also reveals interesting patterns in resistance to change behaviors. Technology sector employees, despite their higher AI anxiety, showed moderate levels of resistance to change ($M = 2.98$, $SD = 0.76$), suggesting a complex relationship between anxiety and adaptability in this sector. This paradox can be explained by the inherent nature of technology work, where change

is constant and adaptation is a core competency. Finance sector employees, however, exhibited the highest resistance to change scores ($M = 3.45$, $SD = 0.89$), which aligns with the traditionally conservative and risk-averse culture prevalent in financial institutions. Manufacturing employees demonstrated the lowest resistance to change ($M = 2.67$, $SD = 0.71$), possibly due to their historical experience with technological transformations and automation processes. Service sector employees showed moderate resistance levels ($M = 3.12$, $SD = 0.83$), reflecting the diverse nature of service industries and varying exposure to technological changes.

Most significantly, the sectoral differences in innovative behavior outcomes provide valuable insights for organizational management. Manufacturing sector employees, despite their lower AI anxiety, demonstrated the highest innovative behavior scores ($M = 3.78$, $SD = 0.82$), suggesting that reduced anxiety and resistance create favorable conditions for innovation. This finding supports our theoretical framework and indicates that manufacturing environments, with their emphasis on continuous improvement and process optimization, foster innovative thinking even in the presence of new technologies. Technology sector employees showed moderate innovative behavior levels ($M = 3.34$, $SD = 0.79$), which appears counterintuitive given their professional context. However, this can be explained by the high AI anxiety levels that seem to counterbalance their natural inclination toward innovation. Finance sector employees exhibited the lowest innovative behavior scores ($M = 2.91$, $SD = 0.73$), consistent with their high anxiety and resistance levels. Service sector employees fell in the middle range ($M = 3.18$, $SD = 0.76$), reflecting the heterogeneous nature of this broad sectoral category.

The moderating effect of resistance to change also varies significantly across sectors, providing nuanced insights into the AI anxiety-innovative behavior relationship. In the manufacturing sector, where resistance to change is lowest, the negative impact of AI anxiety on innovative behavior is less pronounced ($\beta = -0.41$, $p < 0.01$). Conversely, in the finance sector, where resistance to change is highest, the negative relationship between AI anxiety

and innovative behavior is amplified ($\beta = -0.68$, $p < 0.001$), indicating that high resistance exacerbates anxiety's impact on innovation. The technology sector presents an interesting case where moderate resistance levels result in a moderate moderating effect ($\beta = -0.52$, $p < 0.01$), while the service sector shows similar patterns ($\beta = -0.49$, $p < 0.01$). These sectoral variations underscore the importance of context-specific approaches to managing AI implementation and employee concerns.

This research contributes to the existing literature by examining the relationships between AI anxiety, innovative behavior, and resistance to change in organizational contexts. While previous research has explored these constructs individually, this investigation provides empirical evidence for their interconnected nature within the specific context of AI adoption. The findings extend existing theoretical frameworks by demonstrating how resistance to change may moderate the relationship between IA-related anxiety and innovative behaviors. Additionally, the methodological refinement of the Resistance to Change Scale through the exclusion of the poorly performing emotional dimension contributes to measurement theory and provides a more robust instrument for future research.

The findings suggest several potential implications for organizational practice. Organizations may benefit from considering the psychological factors identified in this study when planning AI adoption initiatives. The results suggest that it may be valuable for managers to address employee AI anxiety and resistance to change when implementing AI technologies.

While this study contributes to our understanding within the specific context studied (Istanbul-based organizations across four sectors), generalization to other contexts should be undertaken with appropriate caution. The cross-sectional nature of our data limits causal inferences and may contribute to inflated correlations. Future research might benefit from exploring these relationships using alternative methodological approaches, experimental studies, and qualitative investigations that could provide deeper insights into the mechanisms underlying these relationships.

The exclusion of the emotional dimension from the Resistance to Change Scale, while methodologically justified, represents a limitation in terms of the scope of the resistance measure. Future research could consider developing new measurement items specifically designed to capture emotional reactions to AI-related organizational changes, potentially incorporating current understanding of technology-specific emotional responses.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *Ethical approval was obtained from the Social Sciences Ethics Committee of Istanbul Gedik University (Approval No: E-25155520-050.04-2025.173337.19).*

Informed Consent: *Participants were informed about the purpose and scope of the study and provided voluntary informed consent prior to participation. Confidentiality was ensured and data were analyzed anonymously.*

Data Availability: *The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

Premarital Education Programs and Their Practical Impacts in Türkiye*

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Abstract

This study, which investigates the impact of premarital education programs on marital adjustment in Türkiye, was conducted using a qualitative research method. Within the scope of the research, interviews were conducted with 28 individuals who had participated in premarital education sessions organized by the Ministry of Family and Social Services in various official institutions. To ensure triangulation, additional interviews were carried out with the educators who delivered the training as well as with the designers who developed the program. The study examines marital adjustment in terms of individuals' satisfaction and fulfillment within their relationships and discusses the potential for sustaining a positive level of adjustment through education. Findings indicate that these premarital education programs have a positive influence on marital adjustment. However, the results also highlight the need for improvements in program content, implementation, cultural relevance, and accessibility. By offering a multidimensional evaluation of premarital education both through a review of global literature and within the specific context of Türkiye, this study aims to contribute to the academic literature and inform policymakers.

Keywords: Marriage, family, marital adjustment, premarital education, couple adjustment

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Öz

Bu çalışma, Türkiye’de Aile ve Sosyal Hizmetler Bakanlığı tarafından bazı resmi kurumlarda uygulanan evlilik öncesi eğitim programlarının evlilik uyumuna etkisini araştırmaktadır. Araştırma nitel analiz yöntemiyle yürütülmüş, evlilik öncesi eğitimlere dahil olmuş 28 kişiyle görüşülmüştür. Araştırma çok katmanlı şekilde yapılmış, birden fazla bakış açısıyla değerlendirmek amacıyla eğitimi alan katılımcılar, eğitimi veren uzmanlar ve programı hazırlayan formatörlerle triangulasyon yöntemiyle mülakatlar gerçekleştirilmiştir. Bu çalışma, bireylerin ilişkilerinde yaşadıkları memnuniyet düzeyinden hareketle evlilik uyumunu ele almakta ve evlilik öncesi eğitimlerin bu uyumu nasıl destekleyebileceğini ortaya koymaktadır. Bulgular, evlilik öncesi eğitimlerin özellikle iletişim becerileri, çatışma yönetimi ve eşler arası rol paylaşımı gibi alanlarda evlilik uyumunu desteklediğini ortaya koymakta; ancak mevcut programların içerik, uygulama biçimi, kültürel uyum ve yaygınlık açısından geliştirilmesi gerektiğine işaret etmektedir. Bu çalışma, özellikle alanda hakim evlilik öncesi eğitim modellerine odaklanarak seçilmiş uluslararası literatür örnekleriyle Türkiye’deki uygulamaları içerik, metod ve kültürel uyum açısından değerlendirilerek hem akademik literatüre hem de politika yapıcılara katkı sunmayı amaçlamaktadır.

Anahtar Kelimeler: Evlilik, Aile, Evlilik Uyum, Evlilik Eğitimi, Çift Uyum

* This article is derived from the doctoral dissertation titled “Ministry of Family and Social services's evaluation of pre-marriage training programs in terms of marriage compliance”, completed in 2022 within the Department of Labor Economics and Industrial Relations at the Institute of Social Sciences, İstanbul University.

Introduction

The family is the most fundamental unit of social structure. Individuals who come together through marriage are considered to have formed a family socially. The family has many social, psychological, biological, religious, and cultural functions (Dizman, 2021). In Turkish society, the concepts of marriage and family are inseparable and equivalent concepts. According to the Turkish Civil Code (Law No. 4721), the family is legally defined as an institution with psychological, biological, and sociological functions established by two adults of the opposite sex who fulfill the legal requirements of society (Baş, 2021; Turkish Civil Code, 2001). However, today the concept of family has diversified, with single-parent families and cohabitation relationships emerging (TÜİK, 2023). Moreover, recent research emphasizes that the family should also be considered a context in which power distance, gender roles, and authoritarian dynamics are reproduced, reflecting both its supportive and problematic aspects (Yazgan, 2024).

The concept of marriage in Türkiye has distinctive characteristics compared to other contexts. At the same time, demographic data show a decline in marriage rates and an increase in divorce rates in many Western countries (OECD, 2023). Out-of-wedlock birth rates in Türkiye are low among OECD countries (OECD, 2025). However, Turkish society has been affected by global changes in recent years and has become more diverse. The fertility rate has fallen to 1.48, indicating that Türkiye's population is on a downward trend (TÜİK, 2024). In this context, pre- and post-marital education can contribute to the continuity of marriages, help clarify expectations from marriage, support couples in acquiring skills such as communication, problem-solving, and role-sharing, and make it easier for them to be more aware when making the decision to marry and maintain healthier relationships (Yıldırım, 2021).

The examination of marriage relationship education in the Turkish context is important in terms of academic diversity. Furthermore, the foundations of marriage relationship education are based on Western cultural concepts of interpersonal equality, sexual openness, romanticism, and indi-

vidual satisfaction (Markman et al., 2022; Henrichs, 2020). In this context, when looking at its historical background, Türkiye, located at the intersection of Eastern and Western cultures, embodies both a richness and certain challenges of cultural, historical, and geographical diversity in the design and implementation of marriage relationship education. Therefore, the Turkish example is critically important in terms of testing and evaluating marriage education programs applied in many cultures. This is particularly important because Türkiye's unique socio-cultural dynamics, which combine both collectivist and individualist orientations, provide valuable insights into how universal marriage education models can be adapted to non-Western contexts (Kağıtçıbaşı, 1996, 2010; Sunar & Okman Fişek, 2005). Our study examines the premarital education programs implemented by the Ministry of Family and Social Services in Türkiye since 2012 (Ministry of Family Activity Report, 2012). In this study, the premarital education programs implemented by the Ministry of Family and Social Services since 2012 were evaluated through in-depth interviews with the program developers, educators, and participants. The results of this study are significant in terms of the effectiveness of these state-run education programs in Türkiye.

Literature Review

Relationship education programs were first implemented in religious institutions around the world, for example, in churches in the United States where clergy-led premarital counseling was offered to engaged couples (Healthy Marriage Research Brief, 2017). These programs, which became widespread in the US, Australia, and Western countries starting in the 1950s, were attended by one-third of married couples in the US, UK, and Australia by the end of the 1990s (Stanley et al., 2006; Halford, 2011). There are many studies in the literature on premarital education. Clyde and colleagues (2019) examined the role of government policies and showed that supportive policies improve access and effectiveness, Busby et al. (2007) compared different models to examine their levels of impact and found that structured models yield

stronger outcomes, and McGeorge (2006) investigated the effectiveness of the programs and reported higher marital satisfaction and lower early divorce risk among participants.

Pre-marital preparation programs are categorized in three ways in the literature: theory-based, skill-based, and inventory-based models. All programs aim to develop sustainable, healthy relationships by examining relationships in different ways. One of the theory-based marriage programs, Gottman's strong relationship house model, is based on findings that marriages are generally damaged within the first 5 years (Carrere et al., 2000). The model aims to ensure that the premarital preparation period and the first years of marriage are as calm, happy, supportive, and fulfilling as possible (Gottman, 1993). This therapy, the goal is to transform the course of the relationship by accessing the couple's individual emotions (Goldman & Greenberg, 2007). Imago theory is an approach that provides couples with the emotional skills necessary to build a healthier and more balanced relationship with each other, referencing childhood emotional states related to the difficulties they experience (Harville et al., 2015).

The primary goal of skill-based approaches is to enhance couples' communication skills. Most relationship development programs focus on premarital education rather than the marriage process (Yalçın, 2010). The Minnesota marriage development program, which is skill-based, emphasizes raising awareness about oneself and one's spouse and increasing satisfaction with marriage (Wampler & Sprenkle, 1980). The Relationship Enhancement Program (REP) is a program in which couples show improvement in marital communication, couple satisfaction, relationship harmony, intimacy, and mutual trust (Jakubowski, 2004). In the CCP (Couples Communication Program), couples develop awareness about themselves and their partners by improving their open communication skills (Silliman & Walter, 2000). The goal of the SYMBIS (Saving Your Marriage Before It Starts) program, developed by Parrott and Parrott, is to reveal the strengths of the relationship, develop healthy expectations about marriage, create happiness routines, and improve conflict resolution skills (Parrot & Parrot, 2003). The PAIRS (Practical

Application of Intimate Relationship Skills) program aims to ensure satisfaction in close relationships and develop the ability to maintain enjoyable intimate relationships (Heyman & Durana, 1999). The PREP (Prevention and Relationship Enhancement Program) program focuses on marital success and relationship quality based on a cognitive-behavioral approach (Silliman & Walter, 2000). The CCET (Cognitive-Conceptual Education Training) program considers the development of stress management skills as important as communication skills (Halford & Guy Bodenmann, 2013). Skill-based programs aimed at improving marital relationships differ in terms of the skills they focus on, their partner-centeredness, and their organizational structure. Research findings consistently report that these programs lead to positive outcomes in areas such as communication, marital adjustment, intimacy, and conflict resolution, which is why they were included in this study (Halford & Bodenmann, 2013; Markman et al., 2022).

In the inventory approach program, couples receive feedback by completing relationship measurement and individual assessment inventories (Halford, 2004). The fundamental assumption of the Prepare Enrich premarital preparation and relationship development program is that the quality of a marital relationship can be predicted before marriage (Olson & Olson, 1999). The FOCCUS Pre-Marital Inventory is seen as a user-friendly program that supports couples in preparing for marriage (Foccusinc, 2024). The RELATE program helps couples clarify their perceptions, highlight areas of agreement and disagreement, etc. (Galbraith, 2007). Involving individuals in these trainings, each of which includes different improvement and repair stages, provides them with the opportunity to develop awareness about relationships (Olson & Olson, 1999). This process contributes to important goals such as individuals maintaining their marriages with an egalitarian approach, ensuring their individual happiness, and striving to improve their communication.

Pre-marital education programs focus on preventing potential problems that may arise at different stages of the marriage life cycle, from the preparatory phase of the marriage institution to the loss of the last member of the family (Yıldız, 2016:

69). These programs also provide support for couples experiencing difficulties in the early stages of marriage and for the challenges they may encounter in adapting to each other during their first years together (Yazıcı and Demirli, 2020). In this context, individuals' participation in these education programs increases their relational awareness and supports the development of their communication skills. This situation ensures that they enter into the institution of marriage more consciously and prepared, both physically and mentally, by participating in preparatory training that emphasizes the importance of marriage. Marital adjustment is defined as satisfaction with the marriage union. Marital harmony can also be defined as a reduction in conflicts within the marriage and an increase in satisfaction and contentment (Erbek et al., 2005).

In the Turkish context, marriage is strongly influenced by religious and cultural elements, and in addition to the official civil ceremony, couples often hold a religious ceremony as well (Ersalan, 2012). Cohabitation outside of marriage is considered wrong in many ways in Türkiye (Taya, 2016). Marriage in Türkiye is of great importance in terms of both the continuity of the family line and cultural and emotional togetherness (Yıldırım, 2021). An analysis of programs and studies conducted on family education in Türkiye shows that such work began in the 1980s (Kılıç, 2010). Yalçın (2010) examined the effect of the SYMBIS program on the satisfaction couples derive from their relationships. According to Duran (2010), the PREP program was found to be beneficial in developing couples' communication skills and relationship stability but insufficient in developing positive communication styles regarding conflict.

According to a study by Avcı (2018), the "Marriage Preparation Program" has a sustained impact on university students' couple relationships and relationship stability. According to Yılmaz's (2009) study, couples who participated in a premarital relationship development program using the SYMBIS model reported significantly higher relationship satisfaction levels compared to non-participants. A study by Şen (2009) found that couples voluntarily participated in the training believing it would contribute to their marriage and reported benefits such as improved communication and

conflict resolution skills. According to Kaplan (2018)'s study, the knowledge level of newly married women on premarital sexual health issues was measured to examine its effect on marital adjustment. It was concluded that it was effective in increasing their knowledge levels but had no effect on their marital adjustment and sexual satisfaction in the short term. Recent theses have also revealed similar themes. In Caner's (2024) master's thesis, it was found that there is a significant relationship between single individuals' marriage anxiety and their perception of premarital education; factors such as age, romantic relationship status, and exposure to divorce in the immediate environment were shown to affect anxiety levels, while perceptions of education differed according to variables such as gender and economic status. In Yüksektepe's (2023) doctoral thesis, educators evaluated premarital education as a protective and preventive approach, emphasizing that such programs strengthen couples' communication and reduce the risk of divorce.

The premarital education program of the Ministry of Family and Social Services, which is the subject of our study, consists of four modules: Communication and Life Skills in Marriage, Family Law, Marriage and Health, and the Educator's Handbook (Ministry of Family and Social Services, 2012). These modules are designed for trainers who are experts in their fields and contain information to facilitate the implementation of the program by educators. This information includes practical techniques, pedagogical approaches, and objectives appropriate to the theme of the module. The first module, "Educator's Handbook," contains information on the program content for educators of the family education program. The book "Communication and Life Skills in Marriage" addresses love-centered relationships within the family, especially the most difficult early stages of marriage, the basic criteria for ensuring the couple's peace of mind, the causes of crisis situations, and ways to resolve them. Other modules include the "Family Law Guide" and "Marriage and Health" books (Alpaydın, 2012). The programs are implemented face-to-face, using a group-focused method, and are carried out primarily in social service centers,

municipalities, marriage offices, or family counseling units of muftiships. The presentation materials included in the basic handbook have been revised according to the standards of the relevant General Directorate and prepared with attention to gender equality (Aile ve Sosyal Hizmetler Bakanlığı, 2012).

As of the end of July 2024, the Ministry of Family and Social Services has reached 483,223 people through its Family Education Program (AEP), 219,741 people through Pre-Marriage Education, and 9,162 people through Family Counseling and Divorce Process Counseling. The Ministry of Family and Social Services prepared a pre-marital education program in 2012, and the target for participation in these trainings has been raised in the 2025 Presidential program. In order to achieve this goal, it is also targeted to increase participation in the trainings, monitor them, and even conduct satisfaction surveys (T.C. Presidency, 2025). Furthermore, 2025 has been declared the "Year of the Family" to make the Turkish family structure more dynamic. To this end, the Family and Youth Fund has been established. One of the conditions for benefiting from the fund is the obligation to participate in pre-marital education (Republic of Türkiye Ministry of Family and Social Services, 2025). For this reason, the rate of participation in pre-marital education will increase. In Türkiye, pre-marital education programs are implemented in a comprehensive, multi-actor structure with the contribution of various official institutions of the central government and local administrations.

Although studies on the premarital period are quite limited in the literature, there are more studies aimed at supporting the marital relationships of couples during the marriage period. The main objective of this study is to evaluate the content and effectiveness of premarital education programs implemented by the Ministry of Family and Social Services in Türkiye. In our study, the premarital education programs provided by the Ministry of Family and Social Services of the Republic of Türkiye since 2012 were evaluated through one-on-one interviews with the individuals who prepared and implemented the programs and the participants. In this context, it is significant as the first study to examine the Ministry's marriage education programs from three perspectives. Analyzing

these programs, which are widely implemented in Türkiye but have been evaluated only to a limited extent, in terms of their content, methodology, and cultural adaptation contributes to the literature and provides guidance to policy makers.

Research Method

This study is one of the few examples in the literature analyzing premarital education programs conducted by the Ministry of Family and Social Services in Türkiye, as also supported by previous works in the Turkish context (e.g., Yalçın, 2010; Duran, 2010; Avcı, 2018; Yılmaz, 2009; Şen, 2009). The interview method, which is a qualitative research method, was used to collect data in this study.

In this study, a semi-structured in-depth interview technique was used because it allows for the collection of more in-depth information on the research topic in line with the research design, enables focus on the research topic, maintains the relevance of the interviews to the main theme, and provides greater flexibility in the interview process.

To address the research problem from multiple dimensions, the "data triangulation" method was used by gathering opinions from three different groups (individuals participating in the training, trainers, and program). Data triangulation is broadly defined as examining and evaluating perspectives on a research problem from at least "3" different viewpoints and gathering the opinions of different parties (Williamson, 2005).

The study group was formed using maximum diversity sampling, one of the purposeful sampling methods. The participants included individuals who had attended premarital education, instructors, and trainers. Detailed demographic information is presented in Table 1. Participants were selected from individuals who had been involved in these education programs in different years and in various districts of Istanbul. Interviews were conducted until saturation was reached in participant profiles and response content (Glaser & Strauss, 1967). Due to personal data restrictions, participants could only be reached through official permits from the Ministry, enabling access to those who received, delivered, or

implemented the training. These difficulties were limited to the data collection stage and did not appear as separate findings.

In terms of limitations, the research was restricted to premarital education programs affiliated with the Ministry of Family and Social Services, which limited access. Individuals were reached through social media and personal networks, but when sufficient numbers could not be reached, official meetings and permissions were obtained from the Ministry to interview individuals in different years and positions. This strengthened the quality of the study in terms of sample diversity. Thus, sample diversity was ensured by selecting individuals who received the training at different times, such as those who received it 2 years ago and those who received it 9 years ago, and those who received it in different locations.

The data collection process was completed in 2021. Since then, no structural changes have been made to the content of the premarital education program. Informed consent was obtained from all individuals participating in the study, and their identity information was kept confidential. The study was approved by the Ethics Committee of I.Ü. Sosyal ve Beseri Bilimler Araştırmaları Etik Kurulu with decision number 214891. Due to pandemic conditions, 12 interviews were conducted via Zoom, while 16 were carried out face-to-face. The interviews lasted between 20 and 80 minutes, with a total of 559 minutes of written data collected. Because the duration varied considerably depending on the participants' level of expression, providing an exact average would not be meaningful. A total of 28 individuals were interviewed for the study. In line with the principles of voluntariness and confidentiality, no audio recordings were made because several participants did not consent to recording; instead, reliability was ensured through member checking and detailed note-taking. This method is based on the participant verification (member checking) strategy recommended to increase data reliability in qualitative research. Participant verification is an effective technique to ensure that the participant's statements are correctly understood and reflected by the researcher. After the interviews were taken in detail, the conversations were classified, analyzed, and edited.

The interview data obtained during the data analysis process was subsequently analyzed using content analysis. MaxQDA 2022 software was used in this process. Participants' personal information and similar responses were classified and coded to identify recurring patterns. Thematic analysis was conducted to capture the underlying meanings within the qualitative data. This process allowed the data to be systematically structured and interpreted without reducing it to numerical representations. The coding process was carried out in the following steps: Open coding: The interview transcripts were read individually, and meaningful statements were converted into codes. The codes were created inductively, based directly on the data.



Figure 1. Code Cloud

The purpose of providing the code cloud is to visually illustrate the most frequently recurring concepts that emerged during the interviews. This visual representation complements the thematic analysis by making it easier for the reader to grasp the relative prominence of certain codes and to see the general distribution of ideas expressed by the participants. Thematization: Codes were grouped according to their similarities to identify prominent themes. The main themes that emerged in this study are as follows: communication skills, perception of education, sexuality and health education, roles and responsibilities, the impact of education on marital adjustment, male participation, motivations for participation, and awareness issues. After the coding process, the codes forming the themes were represented visually. For this purpose, a code cloud was created based on the codes frequently used by the participants. The code cloud provides

a visual representation of the most frequently repeated concepts and thematic areas.

To enhance validity and reliability in the study, the coding process was conducted by the researcher, and the themes and codes were submitted for peer review. In addition, the themes were shared with the participants and participant validation was also carried out through feedback. With this analysis process, the data was systematically structured and made analyzable. These processes enabled the research to be structured in a holistic, systematic, and transparent manner.

Research Findings

In order to achieve the objective of the research, some supplementary information was collected from the participants interviewed. Within this framework, data was obtained on the participants' basic demographic characteristics, educational backgrounds, professional statuses, and income levels. Interviews were conducted with a total of 28 individuals residing in various districts of Istanbul and coming from different occupational groups. The participants included individuals currently in education, trainers, and instructors.

Table 1: Descriptive Information About the Study Group

Code	Status of Participant	Occupation	Educational Status	Gender
K1	Participant	Service Staff	High School	Female
K2	Participant	Academic	Doctor	Female
K3	Participant	Academic	Doctor	Male
K4	Instructor	Education Coordinator	Bachelor	Female
K5	Participant	Staff	Bachelor's Degree	Female
K6	Instructor	Psychologist	Bachelor	Male
K7	Participant	Social Worker	Master's Degree	Female
K8	Participant	Psychologist	Master's Degree	Female
K9	Participant	Academic	Doctor	Female
K10	Participant	Social Worker	Bachelor	Female
K11	Participant	Computer Operator	Bachelor	Male

K12	Participant	Security	High School	Female
K13	Participant	Computer operator	Open education	Female
K14	Participant	Service Staff	High School	Female
K15	Participant	Staff	Bachelor's Degree	Female
K16	Instructor	Psychologist	Master's Degree	Female
K17	Trainer	Department Head	Master's Degree	Female
K18	Trainer	Department Head	Master's Degree	Male
K19	Participant	Staff	Bachelor	Male
K20	Participant	Staff	Bachelor	Female
K21	Participant	Staff	Bachelor's Degree	Female
K22	Trainer	Academic	Doctor	Male
K23	Participant	Academic	Doctor	Male
K24	Participant	Staff	Bachelor	Female
K25	Instructor	Staff	Bachelor's Degree	Female
K26	Trainer	Department Head	Doctor	Male
K27	Trainer	Department Head	Bachelor	Female
K28	Participant	Social Services Specialist	Bachelor	Female

Table 1 presents the demographic characteristics of the 19 participants, including their occupations, educational levels, gender, roles in the program, and marital status. It is understood that the vast majority of participants have an income level at or below the minimum wage, while a small number earn above this level.

The analysis of the qualitative interviews revealed ten themes in total: motivations for participating in education, communication skills, sexuality education, role and responsibility sharing, crisis management, conflict management, psychological structure of the opposite sex, family law, the impact of education on marital harmony, and the dissemination of education. However, since this article is derived from a doctoral dissertation, only the themes most relevant to the scope of this study are presented and discussed here.

These themes aim to reveal assessments of the current state of the training provided, general perceptions, and shortcomings encountered in the training processes. Based on the commonalities in

participants' responses, these themes offer valuable insights for making the current training more effective. Below, the findings obtained within the framework of these themes are presented, supported by participant opinions.

When examining participants' motivations for attending the training, it was observed that different reasons were effective for both the organizers and the participants. In general, a significant portion of the participants attended out of curiosity about the content of the training:

"I wanted to participate in such a training before marriage, I was curious." (K28)

Some participants view the training more as an awareness-raising experience. For example, one participant stated that newly married individuals go through the process without being aware of the problems, and expressed that the training is beneficial in terms of raising this kind of awareness:

"When you are newly married, there are many things you don't know. The training helps you recognize and tolerate these gaps in knowledge" (K5)

This type of feedback shows that the training is effective not only in transferring knowledge to participants but also in creating self-awareness. Some participants joined the program thinking that the training could contribute to their children's future marriages rather than their own. These participants consider the training an important tool for intergenerational knowledge transfer.

Some participants stated that they only participated in the training as an activity. These individuals believe that the training was insufficient in terms of content and that the presentation format did not ensure permanence. Such criticisms reveal different perceptions regarding the adequacy and effectiveness of the training content. However, most participants stated that they participated in the training consciously and willingly. It is understood that participation was motivated by different reasons such as curiosity, awareness, preparation for the future, and personal development.

The trainers and facilitators who prepared the training define the main objective of the program as raising awareness about marriage. It is also stated that the training functions within the scope of guidance and preventive services. Indeed, one trainer stated the following:

"The aim was to provide protective, preventive services or raise awareness. To prepare engaged couples who thought they knew most things for marriage." (K4)

As stated, this shows that participants had low expectations at the beginning, but their perceptions changed during the training process. It is emphasized that the training not only serves to impart knowledge, but also to anticipate possible risks and direct participants to support mechanisms. One trainer summarized the scope of the process as follows:

"The goal here is to raise awareness among families, close information gaps, and develop their ability to find solutions that will make family life easier. To create sensitivity and ensure awareness." (K18)

Within the scope of the awareness theme of the training, participants made certain statements. According to some participants, the program's basic approach appears to be shaped around the axes of awareness, information, and guidance. The training is not a type of crisis intervention or treatment-focused; rather, it is more preventive and guiding in nature (Alpaydın, 2012). It is understood that training programs, which do not aim to fully educate couples, provide individuals with basic information and guide them in their search for more information.

The training focuses on key concepts with high representational power rather than problem solving and provides preparation for potential difficulties in married life. One of the corporate representatives organizing the training summarizes this point as follows:

"This training helps participants realize that individual or relational difficulties are normal; we strive to raise awareness by encouraging them to seek professional help as soon as possible, without exaggerating the issue." (K27)

A study conducted on divorced couples in Türkiye found that if couples had received premarital education, they would have been able to resolve their problems more easily (Sürerbiçer, 2008). The education addresses potential problems that may arise in marriage and offers couples solutions, thereby ensuring that marriages remain healthy and happy.

The participants interviewed stated that they had received education in the fields of law, communication, and health, although the order of importance varied. However, the sections that stood out in each individual's mind and fell within their area of interest differed according to their own interests, concerns, and personal needs.

Table 2. Interviewers' Educational Content

Educational Content	Number of People
Communication	12
Conflict Management	8
Roles	6
Sexuality	6
KCPY (Opposite Sex Psychological Structure)	4
Law	2
Health	1
Financial Matters	1

When participants were asked which topics in the training content attracted their attention the most, several areas of interest emerged. The majority of participants emphasized the importance of the "communication" module, describing it as the most memorable and useful part of the training. Other frequently highlighted areas included "conflict management," "role and responsibility sharing," and "sexuality." In contrast, legal issues, general health, and financial topics were rarely mentioned. Notably, participants felt that the topic of sexuality, although included in the health module, was not addressed in sufficient depth and was considered somewhat superficial.

In general, it was observed that participants benefited most from the communication module. Experts stated that they did not encounter any difficulties in processing this module. While the communication module was prominent in terms of content and application, the health and legal themes were kept shorter and had a limited impact. The following points were raised regarding the communication module:

"Relationships were the most important part. Education has a positive impact on how you maintain the relationship and how you establish that communication." (K7)

Communication skills are considered one of the most critical skills for the sustainability of marriage. Indeed, couples' ability to maintain a harmonious marriage depends on their ability to effectively resolve problems in mutual communication. Communication deficiencies or errors are at the root of most problems experienced in marriage (Markman et al., 2022). One of the participants drew attention to this situation with the following statement:

"Crisis management is the most important part. We benefited most from the communication aspect. The communication-related parts affected our marital harmony." (K11)

Crisis management, a sub-theme of the communication theme, was particularly emphasized by the participants. It was noted that proper communication is critical during crises, that other topics can be learned individually, but that the communication module is more effective when guided by an expert. This module strengthens the awareness aspect of the training by enabling the identification of communication problems. Conflict management, another sub-module of the communication theme, is another important module that provides the skill of managing crisis moments in marriage in a healthy way. Participants stated that they experienced the contribution of this training in their practical lives. One trainer explained this topic as follows:

"I think conflict management in marriage is the most essential topic. Most people know about the other topics. Even our cleaning lady is familiar with most things from social media. But conflict and crisis management is a special topic." (K9)

Various studies have also shown that premarital education strengthens skills such as communication and conflict management, that these skills last for at least six months to three years, that relationship quality improves, and that it encourages couples to think about their future (Duran & Hamamcı, 2011; Carroll & Doherty, 2003).

The psychological makeup of the opposite sex is one of the topics highlighted as important in the training. One participant points out that a lack of

sufficient knowledge on this subject can cause problems in maintaining marriages:

"Is there a problem with the psychological makeup of the opposite sex? You don't know. That's why couples need to undergo psychological testing before getting married. Most people don't even show that they are schizophrenic; most people don't show whether they are mentally healthy or not." (K12)

According to Tarhan (2011), recognizing and accepting the psychological differences between women and men is the first step toward a healthy relationship. This awareness facilitates the rebuilding of mutual expectations and creates an environment conducive to establishing a more harmonious marital relationship. Sections on the psychological makeup of the opposite sex are crucial in training programs and are considered essential for maintaining healthy marriages.

Another prominent theme in education is the sharing of roles and responsibilities. The traditional division of labor shaped by gender roles has undergone a transformation with women's participation in the workforce. Participants noted that this change has had an impact on marital dynamics:

"We never said woman or man. We said spouses. There are responsibilities in marriage. At work, my car needs to be washed, ironing needs to be done. When most of these responsibilities are taken on by one spouse, marital discord begins." (K17)

According to the TAY research conducted by TÜİK (2021), 32.2% of divorces are caused by irresponsible and indifferent behavior. Therefore, in the context of Turkish society, including topics such as role and responsibility sharing in premartial education ensures that relationships are built on healthier foundations.

Sexuality is the most fundamental topic addressed in education. Sexuality is one of the most fundamental elements of marriage and is among the critical modules of education. Most participants stated that this topic is covered superficially in education and needs to be addressed in greater depth:

"In traditional upbringing, women are treated differently from men. Sexuality is not accepted as normal. I don't think men know much about it either. I consider

sexuality education important. It is associated with carnal desires, which are seen as materialistic." (K2)

Sexuality, a difficult topic to discuss in society, should be included in education as one of the fundamental purposes of marriage. Some participants expressed their views on privacy, a sub-theme of sexuality, and stated that they were reluctant to discuss this topic in a group setting, especially women:

"I don't feel comfortable discussing private matters in front of everyone. Perhaps it would be better if these topics were discussed separately for men and women" (K16)

The sexuality module is a module that participants are reluctant to discuss. One of the trainers expresses this as follows:

"In marriages, it actually comes down to communication problems, but underneath that lies vaginismus or other sexual difficulties, sexual problems, or sexual violence. That's why sexual issues can be discussed in more detail." (K4)

According to the participant and the trainers in general, the sexual health module is very important, but it is not given enough space in the training. One of the trainers also stated that the module on sexual health was not covered sufficiently. They stated that there was a lack of volunteer experts on the subject. In this context, the training should be enriched in the sections related to sexual health.

Another theme of the training, family law, did not receive sufficient interest from participants. According to participants, the information in this section could easily be obtained from books or consultants.

The theme of marital harmony is one of the most critical themes of the study. A large proportion of participants stated that the training encouraged empathetic thinking and positively affected their marital harmony, while some stated that its effect was limited. There are also participants who believe that participation in the training reflects the value placed on marriage and therefore has a positive effect:

"Actually, beyond what you learn in this training, you are aware that you have a high level of awareness that you are positively engaged in something like this

shows that you are highly aware of your positive attitude toward participating in such a thing." (K23)

Attaching value to marriage, setting aside time for its improvement, and even considering it important enough to participate in training can be seen as a form of mental preparation. One of the educators providing premarital training expresses the contribution of such training to marital harmony as follows:

"The training positively affects marital harmony. There is no scientific data, but there has been feedback about it. Since there are those who ask how we can navigate conflicts, I think it positively affects marital harmony." (K6)

The instructors involved in delivering the training programs have the opportunity to meet with participants one-on-one both during and after the training, allowing them to observe the impact of the training. While some believe these training programs have a positive effect on marital harmony, others believe they are ineffective. These training programs are awareness-focused initiatives that serve a protective and preventive function. Some studies in the literature indicate that the divorce rate among couples who participate in premarital programs is 30% lower (Stanley, 2006). Since there is no follow-up system for couples who participate in premarital training focused on the Ministry of Family and Social Services, the sustainability of marriages as a result of the training is unknown. In this context, the impact of the education on marital adjustment can only be known based on the individuals' own statements.

The theme of expanding education is being developed by the participants. Participants and trainers have made various suggestions to make education more widespread. These include making the training mandatory before marriage applications, encouraging couples to participate, making the sexuality module more comprehensive, increasing the duration of the training, advertising on TV screens, presenting awards and gifts at the end of the training, and making this training mandatory. Participants who believe that the training should be made mandatory express its necessity as follows:

"Before marriage, they require a chest X-ray from the doctor. Before examining the lungs, examine the mind.

Women are oppressed in every way. These trainings should be mandatory before marriage." (K14)

The Turkish Grand National Assembly's Commission on Violence Against Women brought up the issue of mandatory premarital education for couples and a proposal to investigate individuals' history of violence and obtain a psychological report suitable for marriage. Thus, it is proposed that marriage proceedings begin with a psychological report, similar to a blood test (Ensonhaber, 2024). However, the implementation of this study has not yet begun. Another educator recommends regarding the format of the education:

"The state will make it a policy. For example, meetings will be held under the supervision of the village head or at the municipality. Because our people have such a tendency. They go when the state calls." (K25)

According to the trainer, making the training mandatory by the state will increase participation. Making the training mandatory is open to debate in terms of benefits and harms. Participation in the training can be supported through incentives and advertising. However, making it mandatory may cause people to lose interest in the training. In order for the training to become more widespread and reach more people, the majority of participants stated that it should be made mandatory for marriage procedures.

"Generally, people get in line at the marriage offices. A condition could be set that they must have taken such a training course before getting in line. There could be such incentives for those who participate in the training." (K3)

The participant selection process is crucial for the effectiveness of premarital education programs. Preparing these programs specifically for couples applying for marriage will ensure that the right target audience is reached and that the content is conveyed accurately. However, one instructor noted that couples were unaware of the program due to insufficient promotion. Therefore, dissemination strategies should be prioritized. In addition, mass media, especially television, will be effective in increasing the visibility of the program (TIAK, 2024). The media power possessed by the state can be turned into an effective tool for the dissemination of educational programs that support the institution of the family. An instructor who

supports this view expresses the impact of television in this context with the following words:

"For example, AEP advertisements should be increased on TRT. Short promotional films should be made. For example, advertisements should be filmed featuring role models beloved by the public, celebrities who set an example with their marriages." (K26)

If these educational programs are promoted through celebrities who exemplify marriage, participation rates could increase and it could positively contribute to the seriousness of the education in the eyes of society.

Press campaigns conducted through such role models will increase individuals' interest in educational content and their level of engagement. Participating trainers emphasize the power of television to reach audiences, stating that messages conveyed through series, films, and social media can be much more lasting than those delivered in formal classroom settings:

"They get it from TV series, they get it from television, they get it from commercials. An average Hollywood movie can have a greater impact than hundreds of hours of education you would provide through your family education program throughout the year." (K18)

Today, the behaviors, clothing styles, preferences, and lifestyles of characters appearing on screens and social media are in high demand in society and influence social norms. With the "Family and Child-Friendly Production and Series Incentive Awards," 15 million TL in support was provided in 2023 for productions that align with family values (Özdener, 2023). Similarly, the declaration published at the Media and Family Values Workshop held in 2021 recommended promoting healthy relationship models, discouraging distorted relationships, and encouraging productions that uphold family values (Family Workshop, 2021).

Other initiatives undertaken to strengthen the institution of the family include the Family and Youth Fund, established in 2023. Family-focused projects and social support initiatives have been implemented through the Fund. Within the scope of the "Vision Document and Action Plan for the Protection and Strengthening of the Family" announced in 2024, strategic goals have been set in five thematic areas: digitalization, social welfare,

demographic transformation, environment, and disaster management. In this context, 2025 has been declared the "Year of the Family" (T.C. Aile ve Sosyal Hizmetler Bakanlığı, 2025). Thus, it is planned to introduce new applications that will address family policies with a multidimensional approach.

Discussion

Marriage is not only one of the important milestones in the personal life cycle, but also a very important institution for the healthy functioning and continuity of social structures. In the context of Turkish society, marriage and family hold a central role, both culturally and socially, and are often considered inseparable concepts. Marriage in Turkish society is more than just the union of two individuals; it is a structure that ensures the intergenerational transmission of cultural, moral, and religious values through the institution of the family. Pre-marital education is a protective, guiding practice that supports the sustainability of the institution of marriage and increases social welfare.

This study presents a comprehensive analysis of premarital education programs offered by the Ministry of Family and Social Services of the Republic of Turkey in terms of content, implementation, and participant experiences. Findings from data collected using qualitative methods reveal that the majority of participants developed awareness about the education, particularly showing openness to acquiring knowledge on topics such as communication, sexual health, and conflict management. The majority of participants viewed the communication and conflict management modules as the most beneficial sections. This finding is consistent with studies in the literature showing that premarital education improves couples' communication skills and increases long-term relationship satisfaction (Duran & Hamamcı, 2011; Carroll & Doherty, 2003; Stanley, 2006). Furthermore, research indicating that communication gaps form the basis of problems experienced in marriages further reinforces the importance of this education (Markman et al., 2022). Some studies state that premarital education is particularly effective in terms of increasing couples' communication skills and

developing their conflict resolution skills (Galbraith, 2007; Jakubowski, 2004). A limited number of studies conducted specifically in Turkey (Yıldız, 2016; Avcı, 2018; Yılmaz, 2009) indicate that premarital education supports couples in developing their awareness and increasing their relationship satisfaction. Other findings obtained in the study indicate that some participants found certain modules of the education insufficient. It was emphasized that the existing content, particularly on health, law, and sexuality, needs to be improved. This situation should be considered a factor that negatively affects the impact of the education in practice.

The sexuality module is considered the most critical module by participants, yet it has not been sufficiently addressed. Participants found it difficult to be open about this topic, particularly due to perceptions of privacy and social norms. This situation is consistent with the importance of the sexuality module in education, as noted in the literature (Halford & Bodenmann, 2013). Awareness of the psychological structure of the opposite sex and social gender roles is also an important finding. Participants' statements that they do not sufficiently understand the psychological structure of the opposite sex and that this causes problems in their relationships support Tarhan's (2011) view that accepting psychological differences is a fundamental step in healthy relationships. Furthermore, the fact that TÜİK (2021) data shows that sharing responsibilities is an important cause of separation in marriages highlights the critical importance of the role and responsibility module. Another finding, that education contributes positively to marital adjustment, is consistent with the literature, although its effect is limited in some cases. There are studies showing that premarital education programs reduce divorce rates (Stanley, 2006). However, since there are no long-term follow-ups of these programs, it is not possible to see their long-term effects in Turkey.

When examining participants' motivations for attending the training, we observe a strong focus on personal curiosity, the need for awareness, and preparation for marriage. The general consensus among trainers and facilitators is that the training emphasizes preventive and protective aspects, highlighting the value of acquiring this knowledge

during the preparatory phase to ensure long-lasting and strong marriages. They suggest that this approach can positively contribute to marital harmony.

One of the study's original and significant contributions to the literature is that it includes the views not only of individuals receiving the training but also of the trainers delivering the training and the designers developing the format, thereby offering a multi-layered evaluation opportunity. The study differs from similar research in the field by providing a multi-layered analysis of the premarital education process. However, the lack of an empirical and institutional system capable of measuring the long-term effects of education and its impact on marital adjustment means that the evaluations conducted are based on subjective experiences. Therefore, the long-term effects of education should be observed, and improvements should be made by following up on feedback.

This study also offers some recommendations for the dissemination of education based on the participants' views. It should be added to elective courses at universities, supported with incentives before marriage applications, processed on digital platforms, and disseminated through public service announcements, social media content, and famous influencers to reach individuals in many segments of society who are in the pre-marriage or post-marriage stages. Furthermore, the Western literature-heavy content of the program should be updated in line with values specific to Turkish culture. Prior research has shown that work-family dynamics and marital stability differ across cultural contexts (Jiao & Grzywacz, 2024), and recent large-scale cross-cultural findings further indicate that the predictors of marital satisfaction vary significantly depending on cultural characteristics such as individualism, gender equality, and power distance (Grau, Miketta, Ebbeler, & Banse, 2025). Considering these insights, adapting the program to the local cultural dynamics would make the training more acceptable, applicable, and easier for couples to adopt. In conclusion, the findings of the study show strong consistency with the literature.

Conclusion and Recommendations

In conclusion, a multidimensional approach must be adopted for premarital education to be effective. In this context, various recommendations can be made for implementing the education:

1. Dissemination strategies
 - At the university level: An elective course can be offered to senior students to raise awareness about healthy relationships, partner selection, and decision-making before entering professional life.
 - The education should be available both in person and online.
 - By providing information at marriage offices, couples can be directed to training, and in this context, the validity of training received not only from municipalities but also from various institutions such as public education centers, muftiships, non-governmental organizations, and family health centers can be ensured.
 - In order to reach a wider audience with education, through mass media: An indirect but continuous learning experience can be provided through television and social media.
2. Content development strategies
 - Educational content should be separated from the focus on Western values and updated in a socio-culturally and pedagogically compatible manner, in line with Turkish social structure and culture.
 - In particular, sexuality, law, and health models should be restructured in a more detailed and multidisciplinary manner.
 - Topics such as crisis management in education, role and responsibility sharing, and the psychological structure of women and men should be covered in greater detail, and new presentation techniques should be utilized.
3. Monitoring and evaluation strategies

- A data system should be developed within the Ministry of Family and Social Services to track post-education returns and their effects.
- Psychological screenings conducted during the education process should identify individuals with psychological distress at a level that would prevent marriage, and they should be informed accordingly.
- Policies should be developed that provide various financial incentives and advantages to increase participation in premarital education.
- Participants' changes in marital status and relational support situations should be monitored to ensure the empirical evaluation of the programs.

In conclusion, it is believed that premarital education programs within the scope of the family education program organized by the Ministry of Family and Social Services can offer multifaceted contributions to both individuals and society. However, for these contributions to be sustainable, the content of these education programs must be updated socio-culturally and pedagogically. Intuitive insights gained from such qualitative data are highly valuable in developing future-oriented policies. However, it should not be forgotten that these insights must be supported by concrete data in order to be generalized. Furthermore, these educational programs must reach their target audience through multiple communication channels. Updating the content of these educational programs based on pedagogical principles while taking cultural sensitivities into account and disseminating their applications will not only improve the quality of individual relationships but also contribute significantly to building a society composed of healthy families.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The author declares no conflict of interest.*

Ethical Approval: *This study was approved by the Ethics Committee of Istanbul University, Social and Human Sciences Research Ethics Committee (Decision No: 214891).*

Informed Consent: *Informed consent was obtained from all participants prior to the interviews. Participation was voluntary and confidentiality was strictly maintained.*

Data Availability: *The datasets generated and analyzed during the study are not publicly available due to privacy and confidentiality restrictions but are available from the author on reasonable request.*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the author in accordance with scientific research methods and academic ethical principles.*

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RESEARCH ARTICLE

The Relationship Between Depression and Anxiety in Older Adults and Memory Functionality: An Assessment Using Neuropsychological Tests

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Abstract

This research evaluates memory function, depression and anxiety symptoms in elderly individuals and examines the relationship between these variables. The Digit Span Test and the 10/36 Spatial Recall Test were used to evaluate memory function, and the Depression, Anxiety and Stress Scale-21 was used to evaluate mental health. Participants were reached through Healthy Ageing and Support Centres, Public Education Courses and an easily accessible sampling method. Participants were included in the research based on inclusion and exclusion criteria. The tests and questionnaires were administered by a clinical psychologist and a clinical neuropsychologist. The study sample consisted of 160 volunteer participants aged between 66 and 74. The average age of the participants was $M = 68.00$ ($SD = 2.31$). The correlation analysis revealed that increasing levels of depression and anxiety were associated with decreasing memory performance. In gender comparisons, while there was no significant difference between female participants and male participants in terms of memory functionality, it was determined that female participants had higher levels of depression and anxiety than male participants. The findings of the research draw attention to the relationship between mental health and cognitive functionality. In conclusion, managing depression and anxiety in older adults is critical for preserving cognitive function. In this regard, multidisciplinary approaches are needed to develop strategies that support both the cognitive and mental health of older adults.

Keywords: older adults, memory functioning, clinical neuropsychology/neuropsychological assessment, mental health

Öz

Bu çalışma, yaşlı bireylerde bellek işlevselliği, depresyon ve anksiyete belirtilerini değerlendirmekte olup bu değişkenler arasındaki ilişkiyi incelemektedir. Çalışmada, bellek işlevselliğini değerlendirmek için Sayı Dizisi Testi ve 10/36 Uzamsal Geri Çağırma Testi, ruh sağlığını değerlendirmek için Depresyon, Anksiyete ve Stres Ölçeği-21 kullanılmıştır. Katılımcılara, Sağlıklı Yaş Alma ve Dayanışma Merkezleri, Halk Eğitim Kursları ve kolay ulaşılabilir örneklem yöntemi ile ulaşılmıştır. Dahil olma ve dışlama kriterleri dikkate alınarak bireyler çalışmaya dahil edilmiştir. Test ve anketler, klinik psikolog ve klinik nöropsikolog tarafından uygulanmıştır. Araştırmanın örneklemi, 66 ile 74 yaş arası 160 gönüllü katılımcıdır. Katılımcıların yaş ortalaması $M = 68.00$ ($SS = 2.31$)'dir. Yapılan korelasyon analizi sonucu, artan depresyon ve anksiyete düzeylerinin azalan bellek performansı ile ilişkili olduğu bulunmuştur. Cinsiyetler arası karşılaştırmalarda, bellek işlevselliği açısından kadınlar ve erkekler arasında anlamlı bir fark bulunmazken, kadınların erkeklere kıyasla daha yüksek depresyon ve anksiyete düzeylerine sahip olduğu belirlenmiştir. Çalışmanın bulguları, ruh sağlığı ile bilişsel işlevsellik arasındaki ilişkiye dikkat çekmektedir. Sonuç olarak, yaşlılık döneminde depresyon ve anksiyetenin yönetilmesi, bilişsel işlevlerin korunması açısından kritik bir öneme sahiptir. Bu doğrultuda, multidisipliner yaklaşımlar ile yaşlı bireylerin hem bilişsel hem de ruhsal sağlıklarını destekleyici stratejiler geliştirilmesi gerekmektedir.

Anahtar Kelimeler: yaşlı bireyler, bellek işlevselliği, klinik nöropsikoloji/nöropsikolojik değerlendirme, ruh sağlığı.

Introduction

Aging is a natural process that leads to various changes in an individual's physical, cognitive and mental processes. In this process, especially memory functionality is recognized as one of the most important cognitive abilities that directly affect the independence of individuals in daily life activities (Park & Reuter-Lorenz, 2009). Age-related cognitive changes may be manifested by various cognitive losses such as decreased information processing speed, decline in attention processes and weakening of working memory (Salthouse, 2010). However, it is suggested that these changes in memory functioning in older individuals may show individual differences and that various environmental, genetic and psychological factors may affect this process (Craig & Bialystok, 2006; Nyberg et al., 2012).

Age-related declines in memory functioning can reduce the individual's capacity to learn new information, cause difficulty in remembering old information, and ultimately result in a holistic weakening of cognitive abilities (Lindenberger, 2014). This process has a significant impact on working memory, executive functions and episodic memory (McDaniel et al., 2008). The decline in memory functionality with aging may result in the loss of independence in daily life skills, and this may lead to the emergence of psychological conditions such as depression, anxiety and stress in older individuals. It has been reported that depression and anxiety, especially in the elderly, negatively affect memory functioning, accelerate the deterioration in memory processes and increase the risk of cognitive decline (Ownby et al., 2006; Butters et al., 2004).

Cognitive functions are affected by many factors such as genetic factors, lifestyle, education level, nutrition and social environment during the aging process (Salthouse, 2010). Memory functioning is one of the most prominent components of cognitive aging, especially in older individuals, and may manifest itself with problems such as slowing of information processing speed, decreased working memory and decreased ability to recall information over time (Craig & Bialystok, 2006). Various neurobiological processes and environmental factors underlie changes in memory

performance in old age. For example, significant decreases in the functioning of the prefrontal cortex and hippocampus have been observed with aging, revealing the effects on executive functions and episodic memory (Nyberg et al., 2012; Lindenberger, 2014).

These changes in memory functioning may affect the individual's capacity to lead an independent life and cause impairment in the ability to fulfill daily functions (McDaniel et al., 2008). However, studies show that physical activity, mental stimulation and social interaction are important in maintaining memory functioning in old age (Erickson et al., 2011; Hertzog et al., 2008). Physical exercise, especially aerobic activities, has been shown to support memory functioning by increasing hippocampus volume and slow cognitive decline due to aging (Colcombe & Kramer, 2003; Voss et al., 2013). In addition, regular physical exercise has been found to increase brain plasticity and positively support cognitive functions (Kramer et al., 2004).

Cognitive stimulation is also a critical factor in maintaining memory functioning in old age. Studies show that learning new skills, engaging in cognitive activities and mental exercises can improve memory performance in older adults (Valenzuela & Sachdev, 2009). In particular, activities that increase cognitive stimulation such as solving puzzles, learning a new language, and playing a musical instrument have been found to contribute to memory performance (Park et al., 2014). In addition, educational level is also an important determinant in terms of the development of cognitive reserve in old age, and it has been found that individuals with higher levels of education can maintain their cognitive functions for longer (Stern, 2009).

Social interaction is also of great importance for the protection of cognitive health in older individuals. It has been reported that loneliness and social isolation may cause impairment in memory functions and increase the risk of dementia (Cacioppo & Hawkley, 2009). It has been observed that cognitive functions are better preserved and age-related cognitive decline progresses more slowly in individuals with high levels of social interaction (Haslam et al., 2014). Therefore, elderly individuals' participation in social activities and keeping their

social ties strong are among the protective factors that support their memory performance.

On the other hand, mental health factors are among the factors that directly affect memory functioning in older adults. Depression can have significant negative effects on memory functions and contribute to the deterioration of cognitive functions in older adults (Geda et al., 2006). In addition to memory impairments, depression in the elderly may lead to a decrease in executive functions and attention processes (Butters et al., 2004). Especially late-onset depression has been found to be an important factor that increases the risk of developing dementia and is associated with Alzheimer's disease (Ownby et al., 2006). It has been suggested that the negative effects of depression on memory functioning are linked to neurobiological mechanisms such as hippocampal shrinkage, neuroinflammation and neurotransmitter imbalances (Sheline et al., 2003).

In addition to depression, anxiety disorders are also known to negatively affect memory functioning in older adults (Beaudreau & O'Hara, 2009). Anxiety may cause distraction and increase cognitive load, making it difficult for the individual to encode and recall information (Eysenck et al., 2007). Studies show that the negative effects of chronic anxiety on memory functions are more pronounced especially in older individuals and memory loss progresses faster in these individuals (Balash et al., 2013). Moreover, it is suggested that excessive cortisol release caused by anxiety may lead to cognitive decline in the long term due to its neurotoxic effects on the hippocampus (Sapolsky, 2000).

In the literature, there are various studies investigating the effects of depression and anxiety on memory functioning. For example, a longitudinal study by Yaffe et al. (2010) found that older individuals with depression had a higher risk of cognitive decline compared to their peers without depressive symptoms. Similarly, Gulpers et al. (2016) found that depression may increase the risk of developing dementia in older adults and is an important determinant of cognitive decline. Managing depression and anxiety may play a critical role in preserving memory functioning. Studies have shown that cognitive behavioral therapies (CBT),

in addition to antidepressant and anxiolytic drug treatments, can provide supportive effects on cognitive functioning in older adults.

Therefore, research on the relationship between memory functioning and mental health in old age can contribute to the development of interventions that support the cognitive health of older adults. In this context, managing depression and anxiety is of great importance for older adults to maintain their cognitive functions for a longer period of time. In addition, developing multidisciplinary approaches to prevent cognitive decline in elderly individuals will be an important step towards the protection of mental health and memory functioning in old age at both individual and societal levels.

The objective of the present study is to evaluate memory functioning and mental health in old age. In this direction, it was purposed to evaluate the immediate and delayed memory functioning, depression and anxiety levels of individuals aged 65 years and older. A further objective of the study is to elucidate the correlation between memory function and levels of depression and anxiety. The study utilised a relational screening model with the objective of evaluating the relationships between variables.

The hypotheses of the study are as follows:

H1: There is a relationship between age and memory function in old age.

H2: There is a relationship between age and the level of mental disorder symptoms in old age.

H3: There is a relationship between memory function and the level of mental disorder symptoms in old age.

H4: In old age, when educational level is controlled for, the level of mental disorder symptoms is a significant predictor of memory function.

H5: There is a significant difference between genders in terms of memory function.

H6: There is a significant difference between genders in terms of mental disorder symptom level.

Method

Samples and Procedures

The ethics committee report of the study was obtained with the decision numbered 'E.975589' of the meeting held by Süleyman Demirel University Ethics Committee on 20/03/2025. Participants were reached through Healthy Ageing and Support Centres affiliated with municipalities, public education courses, and an easily accessible sampling method. Tests and surveys were administered by clinical psychologists and clinical neuropsychologists. Prior to the commencement of the research, the participants were provided with comprehensive information regarding the process. Following the approval of participants for the study, appointments were scheduled for the administration of tests. Cognitive assessments were conducted in a designated testing environment.

Individuals over the age of 65 who voluntarily agreed to participate in the study were included in the study. The exclusion criteria were being sleepless and tired at the time of the test, illiteracy, alcohol and substance abuse, diagnosis of psychosis, and use of medication that would affect cognitive test performance. The validity and reliability of cognitive tests depend on controlling external and internal factors that may affect an individual's cognitive capacity during the test. In this context, sleep deprivation and fatigue, literacy level, alcohol and substance use, psychotic disorders, and the use of certain medications are among the primary factors that can significantly affect test performance. Sleep deprivation can lead to impairments in attention, short-term memory, decision-making, and executive functions (Killgore, 2010). In particular, functions such as planning, cognitive flexibility, and inhibition have been shown to be significantly weakened in the absence of sleep. Fatigue similarly leads to the depletion of cognitive resources and a decline in performance during testing. In addition, it has been stated that the cognitive performance of individuals with low levels of education may result in low scores on tests, even if they are within normal limits (Manly et al., 1999). Research conducted in the context of Turkey similarly reveals that literacy levels have significant effects on attention and memory tests (Çökmüş & Atabek, 2007).

Chronic use of alcohol and various substances has negative effects, particularly on frontal lobe functions, causing impairments in attention, decision-making, impulse control, and learning (Oscar-Berman & Marinkovic, 2007). In substance use disorders, there is a decrease in information processing speed, attention, and short-term memory performance (Verdejo-García et al., 2004). This situation threatens the validity of cognitive tests based on executive functions. In psychotic disorders such as schizophrenia, significant impairments are observed in numerous cognitive domains, including attention, working memory, abstraction, problem-solving, and cognitive flexibility, from the onset of the disorder (Mesholam-Gately et al., 2009). These impairments negatively affect not only clinical assessments but also the individual's daily functioning (Green et al., 2000). Therefore, the test performance of individuals with psychotic disorders is directly affected by disease-related neurocognitive deficits. Some psychoactive medications, particularly benzodiazepines, anticholinergics, and certain antipsychotics, can cause slowing in attention, memory, and processing speed. Barker and colleagues (2004) revealed that long-term benzodiazepine use has lasting negative effects on attention and memory. Similarly, it has been reported that drugs with a high anticholinergic load can cause cognitive impairment in older individuals (Campbell et al., 2009). Factors such as insomnia, illiteracy, alcohol and substance use, psychotic disorders, and the use of certain medications can significantly affect test performance, thereby increasing the margin of error in interpreting test results. Therefore, it is crucial to systematically assess such factors prior to cognitive evaluations. In consideration of the aforementioned criteria, the study was conducted with a total of 160 volunteer participants, 86 of whom were female and 74 of whom were male. The age range of the participants was between 66 and 74 years, with a mean age of $M=68.00$ years ($SD=2.31$). The sociodemographic information of the participants is presented in Table 1.

Table 1. Sociodemographic Information of the Participants

Variables		n	%
Sex	Female	86	53,75
	Male	74	46,25
Education Level	Primary School	25	15,63
	Secondary School	32	20,00
	High School	51	31,87
	University	52	32,50
Marital Status	Single	53	33,10
	Married	89	55,60
	Divorced	18	11,30
Total		160	%100

Data Analysis

Prior to the analyses related to the research questions, the research data were evaluated in terms of accuracy, missing values and normality assumptions. For descriptive statistics, number and percentage ratios were used for qualitative data, and mean and standard deviation were used for quantitative data. The relationships between variables were evaluated with correlation coefficients.

Data Collection Tool

Spatial Recall Test- SPART: During the test, individuals are asked to remember the location of 6 circles shown on a checkerboard shape with 36 squares (6X6). The test evaluates visual learning and memory. After 3 repetitions, a total learning score is obtained. To assess delayed memory, 15 minutes later, the person is asked to remember the location of the 6 circles without being shown the visual. In this trial, a delayed recall score is obtained (Boringa et al., 2001). It has high test-retest reliability among repeated applications, and the correlation coefficient is $r = .79$. The Cronbach Alpha value for internal consistency has not been reported. Since the test is a single-session measure designed to assess visual-spatial short-term memory. The correlation obtained from the Wechsler visual memory tests conducted to assess criterion validity is high (Benedict, 1997). The advantage of the test and the reason for its preference is primarily that it allows for the assessment of visual memory and short- and long-term memory performance related to visual memory. In addition, the test is quick to administer and independent of linguistic proficiency.

Digit Span Test – DST: Attention, short- and long-term memory, and working memory assessment tests consist of two parts: forward and backward number sequences. In the forward number sequence, the participant is asked to repeat the numbers read by the test administrator in the same order. In the backward number sequence, the participant is asked to count backwards the numbers read by the test administrator in a specific sequence. (Karakaş, Eski, & Başar, 1996). The test-retest correlation coefficients are $r = .82$ for the forward number sequence, $r = .78$ for the backward number sequence, and $r = .87$ for the total score (Wechsler, 2008). The advantages of the test and the reasons for its preference are that it is quick and standardised, can be applied to a wide age range, including children and adults, is powerful in measuring working memory capacity, and is relatively less affected by factors such as educational level and language skills (Lezak et al., 2012).

Depression, Anxiety and Stress Scale- 21: The Turkish reliability and validity study of the 21-item short form of the scale developed by Lovibond and Lovibond (1995) was conducted by Sarıçam (2018). As a result of the factor analysis, it was found that the scale had 3 sub-dimensions, and it was reported that these three factors had an excellent fit index value in the clinical sample and an acceptable fit index in the normal sample (Sarıçam, 2018). Cronbach's alpha internal consistency reliability coefficients for the depression, anxiety, and stress subscales were $\alpha=0.87$, $\alpha=0.85$, and $\alpha=0.81$, respectively. The test-retest correlation coefficients are $r = 0.68$ for the depression subscale, $r = 0.66$ for the anxiety subscale, and $r = 0.61$ for the stress subscale (Sarıçam, 2018). Anxiety and depression subscales of the scale were used in the study.

Sociodemographic Information Form: The form created by the researchers aims to obtain information such as age, education level, marital status of the participants.

Findings

Before testing the hypotheses, the data were preanalyzed. Depending on the results of the preliminary analysis, parametric and non-parametric statistical methods were chosen. In the normality test analysis, skewness and kurtosis values were first checked. Skewness and kurtosis values were evaluated within the limit of ± 1.5 , taking into account the recommendation of Tabachnick and Fidell (2013).

Table 2. Descriptive, Reliability, Normality Analysis

	Mean	SD	α	ω	Skewness	Kurtosis
DST- Forward	12,77	4,35			,437	- ,342
DST-Backward	12,26	4,46			,679	,746
SPART- Immediate	15,95	5,59			,227	- ,550
SPART- Delayed	5,79	2,44			,155	- ,779
DASS-21- Anxiety	4,18	3,21	,821	,832	,849	,668
DASS-21- Depression	4,86	3,27	,814	,825	1,289	1,184

DST: Digit Span Test; SPART:10/36 Spatial Recall Test; DASS-21: Depression, Anxiety and Stress Scale- 21

As a result of the test, it was found that the skewness and kurtosis values in the data were within the limits of normality. Cronbach's Alpha (α) and McDonald's Omega (ω) method were adopted to test the reliability of the scales. The values of preliminary analyses are given in Table 2.

in memory functioning with advancing age in the elderly. The findings of the present study indicate a negative correlation between age and the performance on the forward and backward Digit Span Test (DST), as well as on the immediate and delayed 10/36 Spatial Recall Test (SPART), in individuals over the age of 65. The results of the correlation analysis conducted in this direction demonstrate a statistically significant decrease in test scores with increasing age.

The second research question pertained to the investigation of whether there were significant changes in depression and anxiety symptoms with age. The findings of the correlation analysis demonstrated a decline in anxiety levels and an increase in depression levels with advancing age.

Table 3. Results of Correlation Analysis

Variables		DST- Forward	DST-Backward	SPART- Immediate	SPART- Delayed	DASS-21- Anxiety	DASS-21- Depression
DST- Forward	r	1	,581**	,310**	,316**	-,268**	-,267**
	Sig.		,000	,000	,000	,001	,001
DST-Backward	r	,581**	1	,398**	,356**	-,286**	-,211**
	Sig.	,000		,000	,000	,000	,007
SPART- Immediate	r	,310**	,398**	1	,739**	-,284**	-,259**
	Sig.	,000	,000		,000	,000	,001
SPART- Delayed	r	,316**	,356**	,739**	1	-,220**	-,225**
	Sig.	,000	,000	,000		,005	,004
DASS-21- Anxiety	r	-,268**	-,286**	-,284**	-,220**	1	,701**
	Sig.	,001	,000	,000	,005		,000
DASS-21- Depression	r	-,267**	-,211**	-,259**	-,225**	,701**	1
	Sig.	,001	,007	,001	,004	,000	
Age	r	-,338**	-,298**	-,383**	-,415**	-,034	,057
	Sig.	,000	,000	,000	,000	,762	,555

* $p < 0.05$, ** $p < 0.01$

DST: Digit Span Test; SPART:10/36 Spatial Recall Test; DASS-21: Depression, Anxiety and Stress Scale- 21

Subsequent to the preliminary analyses, the research questions were subjected to evaluation. The primary research question that the study sought to address pertained to the investigation of changes

However, it is important to note that neither of these relationships were statistically significant.

The fundamental question that this research seeks to address is whether there is a significant relationship between memory functioning in old age and levels of symptoms of mental disorder. The relationship between the results obtained from the tests and depression and anxiety scores was tested by correlation analysis. The analysis yielded findings indicating a correlation between elevated anxiety and depression scores and diminished performance on the forward and backward DST, as well as on the immediate and delayed SPART. The values of all analyses are presented in Table 3.

The differences between genders of the variables addressed in the study were analysed. As a result of the analysis, it was seen that the difference between genders in memory functionality was not significant, but depression and anxiety levels were statistically significantly higher in female participants. The values obtained as a result of the Independent Samples T Test are shown in Table 4.

Table 4. Result of Comparison Analysis Between Groups

Variable	Female		Male		<i>t</i>	<i>p</i>
	M	SD	M	SD		
DST-Forward	12,48	4,33	13,32	4,36	-1,167	,245
DST-Backward	11,99	4,41	12,76	4,54	-1,052	,294
SPART- Immediate	15,70	5,58	16,41	5,62	-,764	,446
SPART- Delayed	5,73	2,40	5,89	2,53	-,381	,704
DASS-21-Anxiety	4,58	3,42	3,44	2,67	2,144	,034
DASS-21-Depression	5,34	4,30	4,00	3,13	2,249	,026

DST: Digit Span Test; SPART:10/36 Spatial Recall Test; DASS-21: Depression, Anxiety and Stress Scale- 21

Hierarchical regression analysis was applied in order to evaluate whether educational level, age, depression and anxiety level predicted memory functioning. In the first hierarchical regression analysis, age and education level variables were added to the model in the first step. The results of the analysis showed that the education level variable did not predict the SPART- Immediate scores at a significant level ($B = 0.163$, $p = .295$), while the age variable predicted the SPART- Immediate scores significantly and negatively ($B = -0.317$, $p < .000$). Values of the model, $R^2 = .153$ $F(2,157) =$

14.170 , $p = .000$. In the second step, anxiety and depression variables were added to the model and it was found that the model improved significantly ($R^2 = .290$, $F(2,155) = 15.852$, $p < .000$). In this model, age predicted SPART- Immediate scores negatively and significantly ($B = -0.322$, $p < .000$), anxiety predicted negatively and significantly ($B = -0.330$, $p < .000$), and depression predicted negatively but not significantly ($B = -0.119$, $p = .131$). Education level was not a significant predictor ($B = 0.190$, $p = .185$).

In the second regression analysis, education level and age variables were added to the model in the first step. It was observed that the education variable did not predict SPART- Delayed scores at a significant level ($B = 0.063$, $p = .632$). The age variable was found to be a significant predictor ($B = -0.191$, $p < .000$). Values of the model, $R^2 = .173$, $F(2,157) = 16.466$, $p = .000$. In the second step, anxiety and depression variables were added to the model and it was found that the model improved significantly ($R^2 = .390$, $F(2,155) = 24.769$, $p < .000$). In this model, age predicted SPART-Delayed scores negatively and significantly ($B = -0.287$, $p < .000$), anxiety predicted negatively and significantly ($B = -0.257$, $p < .000$), and depression predicted negatively and significantly ($B = -0.261$, $p < .000$). Education level was not a significant predictor ($B = 0.031$, $p = .788$).

In the other regression analysis, age and education level variables were added to the model in the first step. It was observed that education level did not predict DST-Backward scores at a significant level ($B = 0.048$, $p = .734$). On the other hand, age was found to be a significant and negative predictor ($B = -0.216$, $p < .000$). Values of the model, $R^2 = .089$, $F(2,157) = 7.678$, $p = .001$. In the second step, anxiety and depression variables were added to the model and it was found that the model improved significantly ($R^2 = .265$, $F(2,155) = 13.990$, $p < .000$). In this model, age predicted DST-Backward scores negatively and significantly ($B = -0.206$, $p < .000$), depression predicted negatively but not significantly ($B = -0.150$, $p = .061$), and anxiety predicted negatively and significantly ($B = -0.325$, $p < .000$). Education level was not a significant predictor ($B = 0.078$, $p = .544$).

In the last regression model, age and education level variables were added to the model in the first step. It was observed that education level did not predict the DST-Forward scores at a significant level ($B = 0.050$, $p = .731$). On the other hand, age was found to be a significant and negative predictor ($B = -0.258$, $p < .000$). Values of the model, $R^2 = .115$, $F(2,157) = 10.243$, $p < .000$. In the second step, anxiety and depression variables were added to the model and it was found that the model improved significantly ($R^2 = .295$, $F(2,155) = 16.180$, $p < .000$). In this model, age predicted DST-Forward scores negatively and significantly ($B = -0.258$, $p < .000$), anxiety predicted negatively and significantly ($B = -0.300$, $p < .000$), and depression predicted negatively and significantly ($B = -0.199$, $p = .006$). Education level was not a significant predictor ($B = 0.081$, $p = .537$).

Conclusion and Discussion

This study examined the relationship between memory functioning and depression and anxiety in elderly individuals. The findings indicate a negative correlation between increasing age and memory function. According to the results of the Number Sequence Test and the 10/36 Spatial Memory Test, increasing age is negatively correlated with both forward and backward number sequence repetition capacity and immediate and delayed spatial memory skills. This supports the negative effect of aging on cognitive processes (Salt-house, 2010). Loss of synaptic plasticity, neurotransmitter changes and decreases in brain volume are thought to underlie these cognitive declines that occur during aging (Lindenberger, 2014).

When examining the relationship between memory function and mental health, a negative correlation has been found between depression and anxiety levels and memory performance. A negative correlation was found between depression and anxiety levels measured by DASS-21 and DST and SPART scores. Existing studies in the literature attempt to explain the relationship between depression and cognitive decline. According to these studies, there is a negative correlation between increased depression scores and the cognitive decline process, and this situation may negatively affect memory functions (Ownby et al.,

2006). Similarly, studies explaining the relationship between anxiety and cognitive decline indicate that an increase in anxiety scores disrupts attention processes and shows a negative relationship with memory functionality (Eysenck et al., 2007). The findings of our current study are consistent with this literature.

In our study, no significant difference was found between genders in terms of cognitive function decline in elderly individuals. This finding is consistent with some studies in the literature and suggests that female and male may experience similar levels of decline in cognitive functions during the aging process (McCarrey et al., 2016). It has been suggested that cognitive decline may be gender-independent and that brain aging and neurodegenerative processes may depend on individual and environmental factors rather than biological sex (Ritchie et al., 2018). In particular, it is stated that factors such as education level, physical activity level and social interaction play a protective role in cognitive functions and that these factors may have different effects among individuals regardless of gender (Stern, 2009). Some studies suggest that female perform better in verbal memory tasks in old age, while male may have an advantage in spatial tasks (Asperholm et al., 2019). However, it has been observed that these differences gradually decrease in old age and that there is no significant gender difference in terms of general cognitive functions. The reason for this is thought to be that both female and male are affected by similar neurodegenerative processes during the aging process (Ferreira et al., 2017). The findings of our study reveal that the aging process generally affects cognitive functions in a similar way and that intervention strategies should be developed to protect the cognitive health of older individuals without gender discrimination. Again, when we examined the difference in depression and anxiety symptoms between genders in our study, it was found that female participant showed more symptoms compared to male participant. These results are consistent with previous studies showing that depression and anxiety are more common in female participant (McLean et al., 2011). This finding can be explained by female participants having different coping mechanisms than

male participants in terms of anxiety and emotional processing (Bangasser & Valentino, 2014).

An interesting finding in our study was that no correlational relationship was found between age and anxiety and depression. It is thought that this is because the sample consisted entirely of elderly participants. In order to determine the relationship between age and anxiety and depression, it is thought that it would be more accurate to compare the data of elderly participants with the data of participants in other developmental stages.

Again, within the scope of our study, the predictive effects of educational level, depression, and anxiety levels on different components of memory performance were examined. The findings indicate that educational level is not a significant predictor of any memory measure, whereas anxiety is a significant and negative predictor of all memory measures (SPART-Immediate, SPART-Delayed, DST-Backward, DST-Forward). However, when examining the effect of age on memory performance, it was found to have a significant and negative impact. Depression was found to predict delayed memory (SPART-Delayed) and forward number series (DST-Forward) in a significant and negative manner, but did not predict immediate memory (SPART-Immediate) and backward number series (DST-Backward) in a statistically significant manner. The lack of a significant relationship between educational level and memory performance is consistent with some studies. For example, Mascherek and colleagues (2020) reported that educational level did not significantly predict subjective memory performance when the effects of depression and anxiety were controlled for. Similarly, McLaren and colleagues (2015) also found that educational level did not moderate memory performance in a sample of subclinical depression. One reason for this finding in our study is that the measurement tools used were not affected by educational levels. The use of tools that are more affected by educational levels could change this finding. The negative effect of anxiety is the most consistent aspect of our findings. Beaudreau and O'Hara (2009) showed that high anxiety levels are associated with significant declines in both working memory and episodic memory performance.

The negative effect of depression on memory performance is particularly evident in delayed recall and advanced number sequence performance. Sheline and colleagues (2006) noted that as the severity of depression increases, working memory and processing speed decrease, which negatively affects episodic memory performance. Nebes and colleagues (2000) also found that declines in working memory and processing speed significantly mediated cognitive impairment in elderly depressed individuals.

Based on the findings of our study, the importance of interventions to protect memory performance in older individuals can be discussed. In particular, factors such as physical exercise, cognitive stimulation and social interaction can be said to have a protective effect on cognitive functions (Erickson et al., 2011; Haslam et al., 2014). Especially aerobic exercises are known to improve memory performance by increasing hippocampus volume (Colcombe & Kramer, 2003). In this context, elderly individuals should adopt an active lifestyle and their access to psychosocial support mechanisms should be increased. In addition, individuals' participation in activities that provide mental stimulation (e.g., learning a new language, playing a musical instrument) may increase their cognitive reserves and slow down aging-related cognitive losses (Valenzuela & Sachdev, 2009).

This study has some limitations. The fact that the sample group consisted only of individuals between the ages of 65-74 may limit generalizability due to the exclusion of older individuals. Again, the sample size of the study is considered too small to examine the effects of aging. Future studies should be conducted with larger samples. In addition, since it is a cross-sectional study, the causal relationship between the variables cannot be determined with certainty. It is suggested that future studies should more comprehensively examine the interactions between depression, anxiety and memory functioning using longitudinal designs. However, directly examining the effect of depression on cognitive decline through studies using biomarkers will allow us to better understand the neurobiological mechanisms (Sapolsky, 2000). Another limitation is the use of self-reported data on depression and anxiety. Furthermore, the fact that

the internal consistency Cronbach's alpha value of the SPART inventory is not reported can be considered a limitation in terms of reliability. It would be beneficial for future studies to be revised in this regard.

In conclusion, multidisciplinary approaches are required to maintain memory functionality and reduce depression and anxiety levels in elderly individuals. Supporting mental health is critical for individuals to maintain their cognitive functions. The findings of this study may provide guidance to health professionals and caregivers working with elderly individuals and may contribute to the development of strategies to protect cognitive health in old age.

Declarations

Funding: No funding was received for conducting this study.

Conflicts of Interest: The authors declare no conflict of interest.

Ethical Approval: This study was approved by the Ethics Committee of Süleyman Demirel University (Decision No: E.975589, dated March 20, 2025).

Informed Consent: Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and confidentiality and anonymity were strictly maintained.

Data Availability: The datasets generated and analyzed during the study are not publicly available due to privacy and confidentiality restrictions but are available from the authors on reasonable request.

Authors' Contributions: Both authors contributed to the design, implementation, data analysis, and writing of the study. All authors have read and approved the final version of the manuscript.

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RESEARCH ARTICLE

Fear of Crime in Traffic: An Analysis of Gender-Based Perceptual Differences in the Case of İzmir*

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Abstract

This study examines gender differences in fear of crime within traffic settings. To address the scarcity of traffic-specific research, we developed a 26-item Fear of Crime in Traffic Scale and surveyed 1,505 active drivers in İzmir (768 women; 737 men) using purposive and quota sampling. Exploratory factor analysis supported a three-factor structure—Perceived Individual Insecurity in Traffic, Fear Related to Vehicle Types, and Spatio-Temporal Perceptions of Safety—explaining 79.19% of the variance (KMO = .973; Bartlett $p < .001$). Reliability was high for the total scale ($\alpha = .96$) and strong across subdimensions ($\alpha = .95, .90, .88$). Given non-normal distributions, gender comparisons employed Mann-Whitney U tests. No significant gender differences emerged for Perceived Individual Insecurity ($U = 271,314, z = -1.388, p = .165$) or Spatio-Temporal Perceptions of Safety ($U = 273,649, z = -1.118, p = .265$). However, men scored higher on Fear Related to Vehicle Types ($U = 250,234, z = -3.919, p < .001, r = .101$). Item-level patterns indicate women report greater concern about sexual harassment and verbal abuse, while men report higher concerns tied to public/heavy vehicles and the perceived effectiveness of enforcement. These results nuance the gender-fear literature by showing that, in “mobile public spaces” like traffic, gendered threat perceptions vary by subdimension. The findings inform transportation safety by highlighting the need for gender-sensitive interventions that address both interpersonal risks and vehicle/structural risks.

Keywords: fear of crime, gender, traffic safety, driver perceptions, scale development

Öz

Bu çalışma, trafikte suç korkusuna ilişkin cinsiyet farklılıklarını incelemektedir. Trafik bağlamına özgü araştırma eksikliğini gidermek üzere 26 maddelik Trafikte Suç Korkusu Ölçeği geliştirilmiş ve İzmir’de aktif sürücülük yapan 1.505 kişi (768 kadın; 737 erkek) amaçlı ve kota örnekleme ile ulaşılarak araştırmaya dâhil edilmiştir. Açımlayıcı faktör analizi üç faktörlü yapıyı doğrulamıştır: Trafikte Algılanan Bireysel Güvensizlik, Araç Türlerine Bağlı Korku ve Zamansal-Mekânsal Güvenlik Algıları. Üç faktör toplam varyansın %79,19’unu açıklamıştır (KMO = ,973; Bartlett $p < ,001$). Ölçeğin tümünde ($\alpha = ,96$) ve alt boyutlarında ($\alpha = ,95; ,90; ,88$) güvenirlik yüksektir. Dağılımlar normal olmadığından cinsiyet karşılaştırmalarında Mann-Whitney U testi kullanılmıştır. Algılanan Bireysel Güvensizlik ($U = 271.314, z = -1,388, p = ,165$) ve Zamansal-Mekânsal Güvenlik Algıları ($U = 273.649, z = -1,118, p = ,265$) için anlamlı fark bulunmamıştır. Buna karşılık, Araç Türlerine Bağlı Korku alt boyutunda erkeklerin puanları daha yüksektir ($U = 250.234, z = -3,919, p < ,001, r = ,101$). Madde düzeyinde kadınlar cinsel taciz ve sözlü saldırı kaygılarını daha fazla bildirirken, erkekler kamu/ağır vasıtalar ve yaptırım-denetimin etkililiğine ilişkin kaygılarda daha yüksek puanlar vermiştir. Bulgular, “hareketli kamusal mekân” olarak trafik bağlamında cinsiyete bağlı tehdit algılarının alt boyutlara göre farklılaştığını göstermekte ve hem kişilerarası risklere hem de araç/strüktürel risklere duyarlı politikaların gerekliliğine işaret etmektedir.

Anahtar Kelimeler: suç korkusu, toplumsal cinsiyet, trafik güvenliği, sürücü algıları, ölçek geliştirme

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Introduction

The concept of fear of crime, long debated in the criminology literature, is now widely accepted as a significant variable influencing many aspects of life—from daily routines to social interactions and even political preferences. Numerous studies have documented that this fear varies systematically with demographic factors such as age, gender, socioeconomic status, and place of residence, and can restrict individuals' mobility, social participation, and sense of well-being (Farrall, Bannister, Ditton, & Gilchrist, 1997; Hale, 1996; Innes, 2004; Warr, 1984). Much of this work focuses on urban living, walking alone at night, and general safety perceptions, consistently showing that women tend to report higher levels of fear than men (Stanko, 1990; Ferraro, 1996; Sutton & Farrall, 2005). While these contexts have been widely examined, little research has investigated how fear of crime emerges in traffic environments, where mobility, exposure to strangers, and structural safety conditions intersect in distinctive ways.

The traffic environment has evolved from a simple area for mobility to a complex social arena where perceptions of safety are continuously renegotiated in today's urban life due to the growing number of vehicles, increased driver density, and traffic-related tensions. In this situation, incidents like verbal abuse, reckless driving, the possibility of collisions, or harassment based on a person's gender greatly influence the development of a fear of crime. This is particularly noticeable in the case of women, whose insecurities, whether when using private vehicles or public transportation, highlighted the crucial role that gender plays in influencing fear of crime.

Women report higher levels of fear of crime than men, according to gender-related literature, which emphasizes that this fear is rooted in structural injustices as well as physical threats (Stanko, 1990; Pain, 2001; Ferraro, 1996). Women's strategies, such as being more cautious in public, avoiding certain times of day, or selecting alternative routes, provide important insights into how this fear functions at a behavioral level (Pain, 2001; Loukaitou-Sideris, 2006). Yet little is known about how these tactics operate specifically within traffic environments.

Within the Turkish context, there exists a significant gap in the research on feelings of insecurity and fear of crime in traffic environments. The fear individuals experience in traffic is often discussed in relation to the risk of accidents or violations of traffic regulations. Yet, studies that seek to develop measurement tools for crime-based experiences—such as verbal abuse, physical assault, sexual harassment, or property damage—and their impact on drivers' fear levels are notably scarce. This gap points to a clear shortcoming in the academic literature and simultaneously limits the potential for evidence-based policymaking in the field of traffic safety.

The primary aim of this study is to develop a unique measurement scale for assessing fear of crime in traffic settings and to use this tool to conduct a comparative analysis of perceived safety among male and female drivers. In line with this goal, the study seeks to answer the following research questions:

- Is there a statistically significant difference between female and male drivers in terms of their fear of being victimized by crime in traffic? In which dimensions of perceived safety does this difference become most pronounced?
- Through which types of crimes do male and female drivers most commonly express concern about victimization in traffic? How can these concerns be understood in relation to social, psychological, or structural factors?
- How do individual factors (e.g., driving experience, tendency to take safety precautions) and environmental factors (e.g., time of day, presence of heavy vehicles) shape fear of crime in traffic, and in what ways do these differ between men and women?

This study aims to contribute to the fear of crime literature from a theoretical standpoint, while also offering a practical, evidence-based tool that can inform future traffic safety policies.

Gender-Based Fear of Crime: Differences Between Women and Men

One of the demographic factors that is most commonly studied in the literature on crime fear is gender. Women report higher levels of fear of crime

than men do, according to numerous studies (Stanko, 1990; Ferraro, 1996; Sutton & Farrall, 2005). These findings show psychological threats and a general feeling of insecurity in public places, in addition to fears of physical violence.

Women's fear of crime is frequently interpreted in terms of both the perceived seriousness of the possible outcomes and the probability of becoming victims. Women are perceived as more vulnerable and easily targeted, which increases their sense of threat, according to Ferraro (1996). The social vulnerability hypothesis is commonly cited in this context as a major explanation for why women typically experience higher levels of physical and symbolic fear.

In addition to fearing victimization itself, women also tend to express deeper concerns about the lack of adequate support mechanisms following victimization and a general distrust in the justice system (Pain, 2001; Gilchrist et al., 1998). This perspective reframes fear of crime not merely as an individual emotion, but as a broader social space in which gender roles are reproduced and reinforced.

Men's fear of crime is typically linked to concrete threats such as physical assault, carjacking, or theft, and is generally reported at lower levels than among women. Yet several studies indicate that men also experience notable levels of fear—particularly in situations involving nighttime travel, deserted environments, or the use of public transportation (Sutton & Farrall, 2005; Warr, 2000).

The findings of our study are largely consistent with this body of literature. Female participants, for instance, perceived the presence of heavy vehicles—such as trucks and lorries—as a greater source of threat and were more likely to adopt in-vehicle safety measures. The fact that fear of sexual harassment emerged with notably high scores exclusively among women further highlights the influence of gender roles in shaping the experience of traffic environments. Among male participants, a sense of safety was more often tied to the perceived effectiveness of legal sanctions. In this context, structural measures appear to play a more significant role for men, while for women, both structural solutions and personal safety strategies emerge as key protective factors.

Taken together, our evidence suggests that fear of crime cannot be reduced to urban security conditions or aggregate crime rates; gendered roles and the safety strategies people adopt are integral to how fear is formed. Feminist criminology has long argued that women's fear in public spaces is shaped by patriarchal relations and wider social inequalities (Stanko, 1990; Pain, 2001). From this point, our results show a clear, subdimension-specific pattern: women report greater concern with interpersonal harms within Perceived Individual Insecurity (e.g., verbal/sexual harassment), whereas men score higher on Fear Related to Vehicle Types, pointing to vehicle/structural risks and a greater emphasis on enforcement. In short, within these “mobile public spaces” of traffic, gendered threat appraisals are context dependent.

Perceptions of Safety and Fear of Crime in Traffic Environments

For many years, fear of crime research has primarily focused on traditional public spaces such as streets at night, parks, or other urban environments. In recent years, transportation settings and traffic environments have increasingly been recognized as important components of individuals' safety perceptions (Ceccato & Newton, 2015). Incidents such as road rage, aggressive driving, harassment, assault, or damage to vehicles may result in either direct or indirect forms of victimization for drivers.

One important finding is that female drivers frequently feel more vulnerable in traffic, especially when driving at night or in rural areas. Additionally, women's fear of being victimized tends to increase when large or unfamiliar vehicles like trucks, lorries, or commercial taxis are present. Scholars like Ceccato and Loukaitou-Sideris (2020) contend that transportation safety should be evaluated not only in terms of traffic accidents but also in relation to people's perceptions of security, despite the paucity of research in this particular area.

The Fear of Crime in Traffic Scale developed within the scope of this study represents one of the first systematic tools designed to measure individuals' feelings of fear, threat, and insecurity experi-

enced during transportation. This research contributes to the literature by highlighting that transportation is not merely a technical domain, but also a social and psychological space shaped by subjective experiences.

Methods

This section outlines the research design, characteristics of the study group, the development process of the data collection instrument, and the techniques used for data analysis.

Research Design

Within the parameters of a descriptive survey model, a quantitative research approach was used to conduct this study. Assessing people's perceptions of their fear of crime in traffic environments and determining whether these perceptions vary by gender were the primary goals of the study. A new measurement tool was created as part of the study to gauge people's fear of crime, and its reliability and validity were examined. Descriptive statistics, factor analysis, reliability testing, and non-parametric difference tests were all used in the data analysis process.

Study Group and Sampling Procedure

The study group consisted of individuals residing in İzmir, Turkey, who actively drive motor vehicles. A purposive sampling method was employed to ensure the inclusion of participants who hold a valid driver's license and regularly operate a vehicle. In addition, due to the study's focus on gender-based analysis, quota sampling was also used to achieve a balanced distribution between female ($n = 768$) and male ($n = 737$) participants. This approach ensured that gender-based comparisons could be conducted with statistical reliability.

In total, data was collected from 1,505 participants. The sample includes individuals from diverse age groups, educational backgrounds, and occupational sectors.

Data Collection Instrument and Scale Development Process

Based on the literature review, a 26-item scale was developed to measure fear of crime in traffic environments, encompassing physical, psychological, and structural insecurity perceptions. Expert opinions from law enforcement and academics played a key role in establishing content validity.

Before launching the main study, we conducted a pilot survey in İzmir with 200 participants—100 women and 100 men—who met the eligibility criteria. Prior to fielding, we held consultation meetings with both field practitioners and subject-matter experts to develop the questionnaire. These consultations involved personnel from the Traffic Department of the Turkish National Police, academics specializing in transport safety, and professional psychologists. We also reviewed widely used fear-of-crime scales in the literature and drew them conceptually (scope, wording) when drafting items tailored to the traffic context. In this process, we conceptually reviewed some of the most widely used measures of fear of crime, such as Ferraro's *Fear of Crime Scale* (1995), Ferraro & LaGrange's measures (1987), and the *British Crime Survey* fear-of-crime questions. These instruments were not directly adopted; instead, they were used as conceptual references to design new items tailored to the traffic context.

During recruitment, we prioritized active drivers. Individuals who did not actively drive were excluded and replaced with new participants. This decision extended the fieldwork, but it strengthened the fit between the sample and the study's objectives.

As part of the scale development process, an exploratory factor analysis (EFA) was carried out, revealing a three-factor structure. These factors were identified as: Perceived Individual Insecurity in Traffic, Fear Related to Vehicle Types in Traffic, and Spatio-Temporal Perceptions of Safety in Traffic. The factor structure was supported by high Kaiser-Meyer-Olkin ($KMO = 0.973$) and statistically significant Bartlett's Test of Sphericity values ($p < .001$). The three sub-dimensions together explained 79.18% of the total variance, indicating a satisfactory level of construct validity.

Reliability analysis further confirmed the internal consistency of the scale. The Cronbach's alpha coefficient was calculated as .96 for the overall

scale, .95 for the first sub-dimension, .90 for the second, and .88 for the third—suggesting that the scale demonstrates high reliability across all dimensions.

Data Analysis

The data collected were analyzed using SPSS 23.0 software. Initially, descriptive statistics (mean, standard deviation) were calculated. To examine the construct validity of the scale, Exploratory Factor Analysis (EFA) was performed. The reliability of each sub-dimension was assessed using Cronbach's alpha coefficients.

The assumption of normality was evaluated through histogram plots and the Shapiro-Wilk test. For sub-dimensions where normal distribution was not observed, gender-based comparisons were conducted using the Mann-Whitney U test.

Factor Analysis

The sample demonstrated excellent suitability for factor analysis (KMO = 0.973), and Bartlett's test of sphericity was significant ($\chi^2(325) = 38,775.276$, $p < .001$). These results confirm that the dataset is highly appropriate for multivariate analysis (Kaiser, 1974).

The exploratory factor analysis revealed a three-factor structure. The eigenvalues of the first three factors were 17.360, 2.084, and 1.145, respectively, with a cumulative variance explanation of 79.19%. This level is well above the commonly accepted threshold of 60% in the social sciences, indicating strong structural validity of the scale. The first factor alone explained 66.8% of the variance, while the second and third factors contributed 8.0% and 4.4%, respectively. This structure demonstrates that the scale is built around a strong core dimension while also incorporating meaningful subdimensions that enrich its thematic depth.

Table 1. Perceived Individual Insecurity in Traffic

Item No	Summary of Statement	Factor loading value
S.16.1	Fear of being physically assaulted in traffic	0.750
S.16.2	Fear of being verbally harassed in traffic	0.767
S.16.3	Fear of experiencing sexual harassment in traffic	0.438

S.16.4	Concern caused by witnessing crimes while in traffic	0.788
S.16.5	Fear increased by victimization stories in media/social media	0.774
S.16.6	Impact of victimization stories heard from close contacts	0.790
S.16.7	Behavior changes in traffic due to fear	0.692
S.16.8	Taking in-vehicle safety precautions	0.664
S.16.9	Taking additional personal safety measures	0.663
S.16.11	Impact of structural safety measures on perceived traffic security	0.650
S.16.12	Effectiveness of awareness campaigns in reducing fear	0.628
S.16.13	Effectiveness of enforcement and penalties in reducing fear	0.694
S.16.24	Increased fear after being involved in a traffic accident	0.610
S.16.25	Fear of financial damage to the vehicle	0.629
S.16.26	Impact of dangerous driving behaviors on fear	0.673

This sub dimension focuses on personal risks encountered while driving and the related safety concerns. It includes fears stemming from both direct personal experiences and indirect exposure through media and social environments, such as risks of sexual harassment, verbal harassment, and physical assault.

Specifically, the high factor loading of item S.16.6 (0.790) suggests that people's fear is significantly influenced by victimization stories they hear from close friends and family. This construct also includes behavioral changes (S.16.7), media-induced fears (S.16.5), and the propensity to take different safety precautions (S.16.8–S.16.9).

Individual fear is strongly associated with both personal experiences and public security policies and governmental strategies, as evidenced by the loading of structurally oriented safety measures (such as lighting and police presence), awareness campaigns, and punitive sanctions onto this factor.

Table 2. Fear Related to Vehicle Types in Traffic

Item No	Summary of Statement	Factor loading value
S.16.19	Fear of commercial taxis	0.735
S.16.20	Fear of minibuses	0.776
S.16.21	Fear of shuttle vehicles (e.g., employee transport)	0.771
S.16.22	Fear of public buses	0.751
S.16.23	Fear of trucks and lorries	0.647

All things considered, this factor comprehensively captures how people react to social and environmental cues as well as direct victimization experiences. This suggests that the measure successfully captures individual perceptions of insecurity related to traffic.

Participants' opinions about the safety of various vehicle types and their fear of victimization related to them are captured by this factor. Notably, buses, shuttle services, and minibuses show high factor loadings. These vehicle types are often associated with aggressive driving behaviors, overcrowding, and insufficient regulation, which contribute to a pronounced sense of insecurity among people regarding these modes of transportation

Minibuses (0.776) and shuttle vehicles (0.771) are the most fear-inducing vehicles due to driver behavior and passenger safety concerns, while trucks and lorries (0.647) are mainly associated with physical danger and accident risk.

Fear of victimization is shaped by both personal experiences and social perceptions of different vehicle types, highlighting the need to consider vehicle distinctions in traffic safety.

Table 3. Perceived Safety by Time and Location in Traffic

Item No	Summary of Statement	Factor loading value
S.16.10	Driving experience reduces fear	0.645
S.16.14	Feeling safer while driving at night	0.766
S.16.15	Feeling safer while driving during the day	0.580
S.16.16	Feeling more secure while driving in the city center	0.759
S.16.17	Feeling more secure in intercity traffic	0.737
S.16.18	Feeling more secure while driving in rural areas	0.724

This factor captures how participants' sense of safety is influenced by the traffic environment and time of driving, reflecting perceptions across different times (day/night) and places (urban, intercity, rural). High factor loadings show that people feel safer driving at night (0.766) and in city centers (0.759), with similar safety perceptions in intercity (0.737) and rural areas (0.724). Driving experience also plays a key role in reducing fear (0.645), likely by increasing familiarity, control, and self-efficacy. Overall, this sub dimension highlights that fear in

traffic is shaped by context and experience, not just specific events or vehicle types.

Reliability Analysis

The reliability coefficients of the subscales were found to be at high levels. For the Individual Traffic Insecurity subscale, Cronbach's α was .964 (15 items), which is considered "excellent" in the social sciences. The Fear Related to Vehicle Types subscale demonstrated a similarly high coefficient (α = .952, 5 items), indicating strong conceptual consistency. Finally, the Spatio-Temporal Safety Perception subscale yielded Cronbach's α = .885 (6 items), confirming that this dimension also maintains a coherent structure. Overall, these results indicate that all three subscales are both theoretically consistent and statistically reliable measurement tools.

Descriptive Statistics

Table 4. Descriptive Statistics of the Scale by Gender

Subdimensions	Gender	n	$\bar{X}$	SD
Perceived Individual Insecurity in Traffic	Female	768	3.77	0.85
	Male	737	3.78	0.97
Fear Related to Vehicle Types in Traffic	Female	768	3.69	0.98
	Male	737	3.56	1.02
Spatio-Temporal Perceptions of Safety in Traffic	Female	768	3.92	0.79
	Male	737	4.06	0.76

The mean scores for female ($\bar{X}$ = 3.77, SD = 0.85) and male ($\bar{X}$ = 3.78, SD = 0.97) participants are highly similar. This finding suggests that gender does not produce a notable difference in perceptions of individual insecurity in traffic. Nevertheless, the slightly higher standard deviation among male participants points to greater variability in their responses.

The average score for female participants was 3.69 (SD = 0.98), compared to 3.56 (SD = 1.02) for male participants. This suggests that women expressed greater fear of particular vehicle types, such as heavy-duty vehicles or public transportation. The trend indicates a higher perceived fear among female drivers, even though the difference was not statistically tested.

Table 6. Descriptive Statistics for the Subdimension "Fear Related to Vehicle Types in Traffic" by Gender

Gender	N	X	SD	Median	Variance	Skewness	Kurtosis
Female	768	3.69	0.98	4.00	0.961	-0.707	0.120
Male	737	3.84	1.06	4.00	1.124	-0.847	0.052

This subdimension gauges people's sense of safety based on the time of day (day vs. night) and location (city, rural roads, or intercity travel) in which they drive.

Table 7. Descriptive Statistics for the Subdimension "Spatio-Temporal Perceptions of Safety in Traffic"

Gender	N	X	SD	Median	Min	Max	Skewness	Kurtosis
Female	768	3.57	0.86	3.67	1.00	5.00	-0.494	0.053
Male	737	3.53	0.98	3.67	1.00	5.00	-0.352	-0.374

Higher scores in this dimension reflect a stronger sense of safety than in the other subdimensions, where higher scores indicate greater fear, concern, or negative perceptions.

According to the results, male participants reported a significantly higher sense of safety in this subdimension, with a mean score of 4.06 compared to 3.92 for female participants. This suggests that men feel less threatened—particularly in conditions such as nighttime driving, intercity travel, or rural environments.

This difference may be linked to broader social dynamics, such as the influence of gender roles on perceptions of driving safety, the structural insecurity women face in public spaces, and the heightened risk of potential victimization that women are often socially conditioned to anticipate.

Normality Test

Table 5. Descriptive Statistics for Traffic Insecurity Subdimensions by Gender

Gender	N	X	SD	Min	Max
Female	768	3.77	0.85	1.20	5.00
Male	737	3.78	0.98	1.00	5.00

For the Individual Traffic Insecurity subscale, the mean score was 3.77 (SD = 0.85) for females and 3.78 (SD = 0.98) for males. The Shapiro–Wilk tests were significant for both groups (Females: $W = 0.957$, $p < .001$; Males: $W = 0.916$, $p < .001$), indicating that the distributions deviated from normality. Therefore, non-parametric tests (Mann–Whitney U) were employed for gender-based comparisons.

For the Fear Related to Vehicle Types in Traffic subscale, the normality assumption was tested for both female and male participants.

Both the Kolmogorov–Smirnov and Shapiro–Wilk tests were significant ($p < .001$), indicating that the distributions deviated from normality. Therefore, non-parametric tests (Mann–Whitney U) were employed to examine gender differences.

For the Spatio-Temporal Safety Perception subscale, the normality assumption was tested for both female and male participants. Both the Kolmogorov–Smirnov and Shapiro–Wilk tests were significant ($p < .001$), indicating deviations from normality. Therefore, non-parametric tests (Mann–Whitney U) were employed for gender-based comparisons.

Findings and Analyses

Descriptive Profile of Participants

Table 8. Gender Distribution of the Sample

Gender	Frequency	Percent
Female	768	51.0%
Male	737	49.0%
Total	1505	100.0%

Median	Skewness	Kurtosis
3.93	-0.592	-0.023
4.00	-0.974	0.471

As shown in Table 8, the sample consists of a nearly equal distribution of female (51.0%) and male (49.0%) participants. This balanced gender representation strengthens the reliability of gender-based comparisons throughout the study.

Table 9. Age Distribution of Participants

Age Group	Frequency	Percent
18–24	163	10.8%
25–34	459	30.5%
35–44	392	26.0%
45–54	301	20.0%
55–64	157	10.4%
65+	33	2.2%
Total	1505	100.0%

Most participants were between the ages of 25 and 44, accounting for more than half of the total sample. This suggests that the study primarily reflects the experiences and perceptions of adults in their early to mid-adulthood.

Table 10. Duration of Driver's License Ownership Among Participants

Driving Experience	Frequency	Percent
1 year or less	63	4.2%
2–3 years	368	24.5%
4–6 years	368	24.5%
7–10 years	213	14.2%
11 years and above	493	32.8%
Total	1505	100.0%

The data indicate that a large portion of participants have held a driver's license for a considerable length of time. Over 70% have been licensed for more than three years, and nearly one-third (32.8%) for over a decade.

Table 12. Mann–Whitney U Test Results for Perceived Individual Insecurity in Traffic by Gender

Gender	N	Mean Rank	Rank Sum	U	z	p-value	Effect Size
Female	768	737.77	566,610	271,314	–1.388	.165	0.036
Male	737	768.87	566,655				

While license duration does not necessarily equate to active driving, it does provide an important indicator of participants' potential exposure to traffic environments over time.

Table 11. Frequency of Active Driving Among Participants

Vehicle Ownership Duration	Frequency	Percent
1 year or less	93	6.2%
2–3 years	453	30.1%
4–6 years	354	23.5%
7–10 years	223	14.8%
11 years and above	382	25.4%
Total	1505	100.0%

Based on the definition of active driving as operating a vehicle at least twice per week, the data show that a substantial majority of participants engage in regular driving.

Table 13. Mann–Whitney U Test Results for Fear Related to Vehicle Types in Traffic by Gender

Gender	N	Mean Rank	Rank Sum	U	z	p-value	Effect Size
Female	768	710.33	545,530	250,234	–3.919	.000	0.101
Male	737	797.47	587,735				

Over half have been active drivers for more than four years, and one in four participants report over a decade of consistent driving. This suggests

that the sample represents individuals with sustained and practical driving experience, which enhances the validity of their perspectives on traffic safety and crime-related concerns.

Analyses

As shown in Table 12, the mean rank for female participants residing in İzmir regarding perceived individual insecurity in traffic (737.77) is slightly lower than that of male participants (768.87). The absolute difference between the two groups is relatively small. According to the results of the Mann–Whitney U test, this difference is not statistically significant ($U = 271314$, $z = -1.388$, $p = .165$).

Therefore, the null hypothesis (H_0)—which states that there is no statistically significant difference between men and women in terms of perceived individual insecurity in traffic, the first subdimension of the Fear of Crime in Traffic Scale—was accepted.

H_0 : There is no statistically significant difference in perceived individual insecurity in traffic between female and male residents of İzmir.

As shown in Table 13, the mean rank for female participants residing in İzmir regarding fear related to vehicle types in traffic (710.33) is lower than that of male participants (797.47). This suggests that women exhibit higher levels of fear toward public transportation or large vehicles (e.g., buses, minibuses, trucks) compared to men.

According to the Mann–Whitney U test results, this difference between gender groups is statistically significant ($U = 250234$, $z = -3.919$, $p < .001$). Although the effect size ($r = .101$) is small, it indicates a meaningful trend. This finding aligns with

existing literature suggesting that the types of vehicles encountered in traffic environments tend to evoke greater fear among women.

In conclusion, a statistically significant gender difference was found in the second subdimension of the Fear of Crime in Traffic Scale—Fear Related to Vehicle Types. Accordingly, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted.

H_a : There is a statistically significant difference between female and male residents of İzmir in their levels of fear related to vehicle types in traffic.

<i>Table 14. Mann–Whitney U Test Results for Spatio-Temporal Perceptions of Safety in Traffic by Gender</i>							
<i>Gender</i>	<i>N</i>	<i>Mean Rank</i>	<i>Rank Sum</i>	<i>U</i>	<i>z</i>	<i>p-value</i>	<i>Effect Size</i>
Female	768	765.19	587,663	273,649	-1.115	.265	0.029
Male	737	743.30	545,602				

As shown in Table 14, the mean rank for female participants in the subdimension Spatio-Temporal Perceptions of Safety in Traffic (765.19) is slightly higher than that of male participants (743.30). However, the results of the Mann–Whitney U test indicate that this difference is not statistically significant ($U = 273649$, $z = -1.118$, $p = .265$).

These findings suggest that there is no significant difference in perceived safety related to time and location in traffic between genders. Moreover, the effect size ($r = .029$) is very small, indicating that the practical significance of the observed difference is also minimal.

Therefore, the null hypothesis (H_0) was accepted for this subdimension as well.

H_0 : There is no statistically significant difference in spatio-temporal safety perceptions in traffic between female and male residents of İzmir.

Discussion

This study, conducted with a sample from İzmir using a newly developed measurement tool, aimed to explore gender-based differences in fear of victimization in traffic settings. The findings reveal noteworthy insights when interpreted in light of the broader fear of crime literature. A consistent body of research has shown that women tend to report higher levels of fear compared to men, partic-

ularly in situations involving a risk of physical victimization such as the threat of sexual violence (Stanko, 1995; Pain, 2001; Warr, 1984).

By contrast with much of the public-space literature, a gender difference emerged on one domain only: men scored higher on the Fear Related to Vehicle Types subdimension ($U = 250,234$, $z = -3.919$, $p < .001$, $r = .10$). For Perceived Individual Insecurity, the small male advantage in mean ranks was not statistically significant ($U = 271,314$, $z = -1.388$, $p = .165$, $r = .04$).

For Spatio-Temporal Perceptions of Safety, gender differences were also non-significant ($U = 273,649$, $z = -1.118$, $p = .265$).

Note that higher scores on the Spatio-Temporal scale indicate greater perceived safety, not fear. Taken together, the results suggest that, in traffic settings, gendered threat appraisals hinge more on vehicle/structural cues for men, while women's elevated concerns concentrate on interpersonal harms.

This finding opens new avenues for discussion by highlighting not only the way gender roles are manifested in traffic environments but also the dynamic and context-dependent nature of fear of crime itself.

In order to completely comprehend this discrepancy, fear of crime needs to be taken into account in combination with contextual factors as well as gender identity. Traffic environments are defined by mobility, speed, and high levels of interaction, in contrast to traditional public spaces that are often studied in the literature on crime fear. Both social roles and disparities in lived experience may be responsible for the finding that male participants reported higher perceptions of risk in traffic. One of the main causes of a fear of crime is a sense of danger that can be triggered by this increased exposure. Because of the bad experiences they have as active participants in traffic, men tend to become afraid, whereas women are frequently seen as possible victims.

Additionally, it is clear from looking at the sub-dimensions where men expressed higher levels of fear that big vehicles like trucks and lorries are seen as dangerous. Additional concerns include behaviors that compromise traffic safety (e.g., tailgating, aggressive overtaking), as well as the perceived inadequacy of enforcement and penalty mechanisms. These items reflect threats rooted directly in driving experience and vehicle control. Taken together, these results suggest that male participants associate fear in traffic more with technical and mechanical risks, rather than interpersonal or symbolic threats.

In the fear of crime literature, women have consistently reported higher levels of fear—a trend attributed to both social roles and a culturally reinforced expectation of victimization shaped by patriarchal norms (Stanko, 1995; Pain, 2001). Factors such as physical power differentials, the risk of sexual assault, and gender norms contribute to women feeling more vulnerable in many public contexts (Warr, 1984; Madriz, 1997). Yet the finding in this study—that women reported lower fear scores than men—appears, at first glance, to contradict this well-established pattern. This discrepancy can be better understood by considering the specific context of the research: the traffic environment.

Although traffic spaces are technically public, they provide a degree of personal enclosure and physical separation. Being inside a vehicle may enhance the sense of safety for women, in contrast to open public settings. The social pressures of visibility and the constant sense of being “threatenable” that many women experience in daily life may be diminished while driving. This could help explain the lower levels of reported fear. Additionally, women are often more cautious drivers and tend to avoid high-risk areas, which may further reduce their perceived likelihood of victimization (Loukaitou-Sideris, 2006).

In this study, female participants tended to emphasize forms of personal victimization such as verbal harassment, sexual assault, and physical aggression, whereas male participants focused more on issues related to traffic regulation, aggressive driver behavior, and mechanical threats. This divergence highlights how gender shapes not only

the intensity but also the nature and content of fear of crime.

These differences suggest that fear of crime is not merely about how much fear is experienced, but also about what people fear and how they interpret it. Existing literature has consistently shown that women report higher levels of fear. For instance, Warr (1984) argues that women’s elevated fear levels stem from the perceived risk of sexual assault. Ferraro (1996) similarly emphasizes that fear of crime is not only linked to physical threat but also to social vulnerability—positions in which women have traditionally been viewed as more fragile or exposed.

Conversely, the fact that men in this study reported higher fear scores in certain subdimensions suggests that fear of crime is not always one-dimensional or strictly bound to gender stereotypes. In particular, in “mobile public spaces” like traffic environments, men’s fears may become more prominent. One reason may be their greater active presence and exposure in traffic. Men are often more frequently involved in driving and may encounter situations such as road rage, disputes over right-of-way, or general tensions among drivers more regularly. Their higher fear scores may therefore reflect direct experiences or witnessed incidents, rather than generalized anxieties.

On the other hand, the concept of the victimization paradox—widely discussed in the literature—can be revisited in light of these findings. This paradox suggests that although women are statistically less likely than men to be victims of crime, they tend to report higher levels of fear (Young, 1988). However, the traffic context of this study appears to reverse that paradox. In this environment, the threats that men actually face may be more direct and frequent. Behaviors such as aggressive overtaking, road rage incidents, and physical confrontations on the road are often more commonly experienced—or even enacted—by men. As a result, men may find themselves positioned simultaneously as potential offenders and potential victims in traffic scenarios.

In summary, the results of this study show that fear of crime is influenced by situational dynamics, context, and environment rather than being a fixed, gender-based phenomenon. This adds a local perspective to the literature on crime fear and

offers fresh perspectives on how fear appears in various social contexts, including parks, traffic, nightlife, and homes. Furthermore, the findings lend credence to the notion that fear of crime is a complex construct influenced by social roles, societal expectations, and perceived risk exposure rather than just being an individual psychological state.

Conclusion and Recommendations

This study makes a distinctive contribution to literature by examining fear of crime in the traffic context through a gender lens. The findings suggest that the long-standing assumption that women consistently report higher levels of fear may not hold true across all domains. This indicates the need to revisit theoretical frameworks considering changing gender roles and the structural and environmental risks that men may encounter more frequently in traffic.

The study also highlights how aggressive driving behaviors, systemic safety deficiencies, and media portrayals shape perceptions of fear in traffic environments. These insights underscore that fear of crime is not only rooted in the risk of physical harm but also in its psychological and symbolic dimensions.

Limitations include the fact that the sample was drawn solely from İzmir and that the measurement tool was applied for the first time. Future research should therefore extend the analysis to different regions and more diverse populations to enhance generalizability.

Looking ahead, further studies should integrate gender equality perspectives and explore fear perceptions across various modes of transportation and socio-demographic groups. From a policy standpoint, transportation strategies and safety campaigns should consider not only objective risk indicators but also individuals' subjective perceptions in order to improve social well-being. In this way, the study demonstrates how the traffic environment influences individual experiences of fear and provides both theoretical and policy-relevant insights.

Declarations

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Conflicts of Interest: *The authors declare no conflict of interest.*

Ethical Approval: *This study was approved by the Scientific Research and Publication Ethics Committee of the Turkish National Police Academy (Decision No: 2024/02, dated March 11, 2024).*

Informed Consent: *Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and confidentiality and anonymity were strictly maintained.*

Data Availability: *The datasets generated and analyzed during the current study are not publicly available due to privacy and confidentiality restrictions but are available from the authors on reasonable request.*

Authors' Contributions: *All authors contributed to the conception, design, data collection, analysis, and writing of the study. The corresponding author coordinated the research process. All authors read and approved the final version of the manuscript.*

AI Disclosure: *No artificial intelligence-based tools or applications were used in the preparation of this study. All content of the study was produced by the authors in accordance with scientific research methods and academic ethical principles.*

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Appendix 1: Mean Scores of Female and Male Participants Regarding Items of Fear of Crime in Traffic

<i>Item</i>	<i>Female Mean</i>	<i>Male Mean</i>		
Driving in a manner that endangers traffic safety (e.g., reckless lane changes, drifting, improper overtaking) increases my fear of being a victim of crime.	3.99	3.90	Victimization stories I see/hear in the media or on social media increase my concern about experiencing crime in traffic.	3.74 3.79
Measures that enhance traffic safety (e.g., better lighting, increased police presence) positively affect my sense of security.	3.94	3.92	Due to fear of victimization, I modify my behavior in traffic.	3.70 3.82
Traffic enforcement, including penalties and sanctions, is effective in reducing my fear of victimization in traffic.	3.77	3.98	I take additional safety precautions (e.g., pepper spray) to feel more secure.	3.72 3.78
Trucks and trailers increase my fear of being a victim of crime in traffic.	3.81	3.92	Minibuses increase my fear of being a victim of crime in traffic.	3.65 3.84
Due to safety concerns, I take in-vehicle precautions (e.g., dashboard camera, window tinting).	3.80	3.90	Shuttle buses increase my fear of being a victim of crime in traffic.	3.65 3.85
Crimes I witness in traffic increase my safety concerns.	3.80	3.90	The fear of being verbally abused in traffic causes me concern.	3.71 3.76
Actions that may cause material damage to the vehicle increase my fear of being victimized.	3.80	3.86	Buses increase my fear of being a victim of crime in traffic.	3.65 3.79
Being involved in a traffic accident increases my fear of victimization.	3.79	3.84	As my driving experience increases, my fear of being a victim in traffic decreases.	3.74 3.54
I feel safer while driving during the day.	3.81	3.82	I feel safer when driving on intercity roads.	3.53 3.60
The fear of being physically assaulted in traffic causes me concern.	3.74	3.86	I feel safer when driving in city centers.	3.64 3.39
Public awareness campaigns (e.g., PSAs, events) reduce my fear of being a victim in traffic.	3.74	3.85	I feel safer when driving in rural areas.	3.45 3.54
Victimization stories I hear from people close to me (family, friends) increase my concern about encountering crime in traffic.	3.69	3.86	I feel safer when driving at night.	3.26 3.27
Taxis increase my fear of being a victim of crime in traffic.	3.69	3.84	The fear of being sexually harassed in traffic causes me concern.	3.69 2.72

RESEARCH ARTICLE

The Effect of the Weight Variable on Predicting Reading Comprehension Achievement in PISA 2018: A Data Mining Approach

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Abstract

This study investigates how student-level sample weights affect model performance in predicting achievement scores. The analyses employed Classification and Regression Tree (CART) and Random Forest (RF) methods with 34 independent variables from the 2018 PISA student survey. Since no prior data mining studies in Turkey have considered sample weights, this research provides an original contribution to the field. According to the findings, when sample weights were used, only one of the ten significant variables identified by the CART method differed, while the order of variable importance also shifted. In the models created with the RF method, only five variables remained common, and the others differed. When sample weights were included in both methods, a slight, statistically non-significant decrease was observed in the prediction performance of the models. These results indicate that sample weights are effective in variable selection but do not significantly affect overall model accuracy. Overall, the findings highlight the necessity of incorporating sample weights to ensure valid and reliable results in large-scale educational data mining.

Keywords: Classification, Sample weight, Data mining

Öz

Bu çalışma, öğrenci düzeyi örneklem ağırlıklarının başarı puanlarını yordamadaki model performansını nasıl etkilediğini incelemektedir. Analizlerde, 2018 PISA öğrenci anketinden elde edilen 34 bağımsız değişken kullanılarak Sınıflama ve Regresyon Ağacı (CART) ve Rastgele Orman (RF) yöntemleri uygulanmıştır. Türkiye’de daha önceki veri madenciliği çalışmalarında örneklem ağırlıkları dikkate alınmadığından, bu araştırma alana özgün bir katkı sunmaktadır. Bulgulara göre, örneklem ağırlıkları kullanıldığında CART yöntemiyle belirlenen on önemli değişkenden yalnızca biri farklılaşmış, ancak değişkenlerin önem sırası da değişmiştir. RF yöntemiyle oluşturulan modellerde ise yalnızca beş değişken ortak kalmış, diğerleri farklılık göstermiştir. Her iki yöntemde örneklem ağırlıkları dâhil edildiğinde, modellerin yordama performansında hafif fakat istatistiksel olarak anlamlı olmayan bir düşüş gözlenmiştir. Bu sonuçlar, örneklem ağırlıklarının değişken seçiminde etkili olduğunu ancak genel model doğruluğunu anlamlı biçimde etkilemediğini göstermektedir. Genel olarak, elde edilen bulgular, geniş ölçekli eğitimsel veri madenciliğinde geçerli ve güvenilir sonuçlar elde etmek için örneklem ağırlıklarının kullanılmasının gerekliliğini ortaya koymaktadır.

Anahtar Kelimeler: Sınıflama, Örneklem ağırlığı, Veri madenciliği

Introduction

Sample weights are a statistical tool that ensure the accurate representation of subgroups (e.g., region, age, gender) in the general population. Their use enhances both the validity and generalizability of research findings. Sample weights also compensate for missing data and sampling bias, thereby improving the reliability of results. In international studies (such as PISA), it is very important to take into account the representation of students from different countries. Such weights ensure comparability of data from different countries and play a key role in calculating the contribution of each observation unit of the sample to the general population. This ensures that statistical analyses are performed correctly and helps to generalize the results. They are widely used in social science research, including education, health, and economics. For example, they are vital for reflecting representation rates in studies across different education levels or socio-economic groups. In short, sample weights are essential for obtaining accurate and generalizable results. Therefore, their correct use is critical in large-scale and international studies (OECD, 2009). The weight variable is often used in research datasets to accurately reflect the representation of different groups in the population. The weight variable plays a critical role in analyses to understand achievement gaps between different demographic groups or geographical regions. For example, such weighted analyses can be used to identify differences in the performance of students of different socio-economic status in reading skills. This allows more accurate and meaningful results to be obtained by taking into account the actual representation of each group in the main population (Asparouhov, 2005).

In recent years, the importance of multivariate data collection in educational research has increased significantly. A prominent example of such data collection is the Program for International Student Assessment (PISA). Since its inception in 2000, PISA has been administered every three years by the Organization for Economic Cooperation and Development (OECD) to assess the performance of 15-year-old students in key areas such as mathematics, science and reading. The main purpose of PISA is to assess the extent to

which students have the knowledge and skills necessary for real-life situations after completing compulsory education (MEB, 2016a; OECD, 2019). PISA assesses three main areas: reading literacy, mathematics literacy and scientific literacy. The program measures how well students can apply their knowledge in these areas to solve problems in different contexts. For example, PISA focused on reading comprehension in 2009 and 2018, mathematical literacy in 2003, 2012 and 2021, and scientific literacy in 2006 and 2015. Turkey has been participating in PISA assessments since 2003. By analyzing the data obtained from PISA through data mining (DM) methods, the independent variables that predict achievement can be revealed. In exams such as PISA, it is important to analyze the samples by weighting them so that the results of students from different countries can be compared accurately.

Since reaching the main population in large-scale exams is costly in terms of time, effort and money, it is aimed to select the sample that can best represent the main population. Sample weights provide a solution to differences between the statistics obtained from the sample and the parameters of the main population (Rust, 2013). For example, in the PISA 2018 technical report, it is emphasized that the students included in the sample should represent the students in the main population in the most accurate way, and it is stated that the student level sample weights should be used in the analysis of the PISA data (OECD, 2017). In PISA, which is one of the large-scale exams, multi-stage sampling method is used in the sampling process. This can significantly affect the accuracy of the statistics obtained from the analyses (Rust, 2013). In the first stage, schools are selected according to their size and in the second stage, classes or students are randomly selected from these schools (LaRoche & Foy, 2016; OECD, 2017). The number of students to be included in the study is determined according to the size of the school. In PISA, the number of 15-year-old students in the school is included in the model when determining the school size. To ensure equal probability of selection, a stratified random sampling method is used. If the sample is not selected randomly, sampling bias may occur. To avoid this bias, sampling

weights at the student level are used to ensure that each individual is accurately represented in the main population. Student-level sample weights are used to adjust for unequal probabilities of selection in the sample and ensure that the sample accurately represents the population. Calculated as the inverse of the probability of selection. For example, if in a group of 100 people each person has an equal chance of being selected, in a random sample of 10 people each individual has 1/10 chance of being selected. Each individual will therefore have a weight of 10, meaning that their impact on the sample mean is adjusted to reflect their proportion in the general population. In the second example, in a group of 90 people, 30 wear glasses and 60 do not. If a random sample of 6 people is selected, 3 with glasses and 3 without glasses, the sample may not reflect the overall distribution of glasses wearers in the population. However, by applying sample weights, the effect of eyeglass wearers and non-wearers can be adjusted, and the sample mean can be close to the population mean despite equal representation in the sample. In this case, while the probability of 3 students with glasses to be selected among 30 students with glasses is $3/30 = 0.1$, the probability of 3 students without glasses to be selected among 60 students without glasses will be $3/60 = 0.05$. Thus, the weight of each selected individual with glasses will be 10, while the weight of each individual without glasses will be 20. Let's assume that the weight of the individuals with glasses is 65, 75, 80 and the weight of those without glasses is 45, 67, 73, then the unweighted sample mean is $(65+75+80+45+67+73)/6 = 67.5$, while the weighted sample mean is $[(65 \times 10 + 75 \times 10 + 80 \times 10) + (45 \times 20 + 67 \times 20 + 73 \times 20)] / 90 = 65.55$. As a result, in the absence of weighting, the mean of the main population will be estimated in a biased manner (LaRoche and Foy, 2016; OECD, 2017, Rutkowski et al., 2010). In Rutkowski et al. (2010), TIMSS 2007 Bulgaria's mathematics achievement mean was calculated as 463.63 when student-level sample weights were used, while it was found to be 481.38 when student-level sample weights were not used. In the multi-stage sampling method, in the process of determining the schools first and then the students, the school weight, the in-school weight and the student weight are determined consecutively.

The weights used in large-scale exams such as PISA facilitate the analysis of data by ensuring accurate calculation of sampling errors and accurate estimates and interpretations for the population (Tat, Koyuncu, & Gelbal, 2019). The weighting procedures in these exams are based on school-based and within-school-based weighting factors and 5 adjustment factors. Adjustment factors are used to account for non-participating students in other schools with similar characteristics to the participants in a particular school, to balance students' age and grade level, to account for in-school non-participants by gender, grade level and region, to reduce unexpected multiple university-based and all other weighting factors (Tat et al., 2019).

The perspective adopted by Bezek Güre et al. (2020) is based on a data mining-based prediction model with high performance in identifying important variables. However, in the study conducted by Bezek Güre et al. (2020), student-level sample weights were not included in the model during the identification of important variables. On the other hand, Arıkan et al. (2020), using large-scale exam data such as PISA, TIMSS and PIAAC, determined that the results obtained by using the student level weight variable in the analysis process with t-test and linear regression method differed. Tat et al. (2019) found that the weighting of all possible values, the use of sampling weights, and the way of using possible values in multiple linear regression and HLM method have important roles in estimating coefficients, standard errors, and explained variance ratio. In these studies, classical statistical methods were used, not data mining-based methods. The statistical procedures mainly used for questionnaire weighting in exams such as TIMSS, PIRLS and PISA can be seen in the studies of Cochran (1977), Lohr (2010) and Sarndal et al. (1992). Meinck (2015) emphasised the importance of using weighting when estimating population characteristics from sample data.

There are studies in the literature that use data mining methods to identify variables predicting success (Abad & Lopez, 2016; Aksu & Güzeller, 2016; Gamazo & Abad, 2020; Kiray et al., 2015; Yung et al., 2012). However, weight variables were not used in these studies. Von Davier et al. (2009) and Rutkowski et al. (2010), using the example of Bulgaria TIMSS 2007, emphasized that the use of

student-level sample weights in the analysis of test data is important for the accuracy of the results. Today, large-scale test results play a critical role in determining countries' educational policies and investments (Hamilton, 2003). However, misinterpretation of these test results in the past has caused some countries to follow wrong educational policies. Especially Germany, which participated in the PISA test for the first time in 2000, changed its education policies significantly due to the fact that its results were below the averages of other countries. This situation emphasises the importance of interpreting large-scale test results correctly (Waldow, 2009). Another example of this situation is Japan's drastic changes in educational policies after its failure in PISA 2000-2003 reading comprehension and 2003-2006 mathematical literacy (Wiseman, 2013). As a result of these problems, the analysis of large-scale test data requires appropriate statistical analysis methods (Wiseman, 2013).

Within the scope of this research, it is aimed to guide the researchers in order to ensure that the correct results are obtained due to the erroneous results that may be obtained if sampling weights are not used in the analysis process of this data. For example, Arıkan et al. (2020) estimated the dependent variable of students' science performance scores by using disciplinary climate, liking science, self-efficacy in science, teacher-centered science teaching, teacher support based on student demand, epistemological beliefs, socio-economic status and research-based science teaching as independent variables in PISA 2015 Turkey. In this study, the findings obtained from 8 models of 11 dependent variables created by taking into account 10 possible values and the average of these 10 possible values as a result of the analysis performed by multiple regression method without using sample weights show that the use of weight variables affects the research results and produces erroneous results. Similarly, Tat et al. (2019) determined that sample weights play an important role in estimating regression coefficients, standard errors and explained variance ratio in their study on PISA 2015 Turkey.

When the literature related to the research topic was examined, it was found that the awareness regarding the use of sampling weights in the analysis

of large-scale test data was not at a sufficient level. For example, Aksu and Güzeller (2016) did not use student-level sample weights to determine the variables predicting achievement using the PISA Turkey sample in their data mining-based study. The studies focus on variables that predict success or performance, but these studies are not conducted by considering student-level sample weights. However, it is important to verify whether the results of the analyses change by considering student-level sample weights. To address these limitations, this study aims to guide researchers in data mining studies by raising awareness about sample weights.

Purpose of the Study

The primary objective of this study is to enhance the accuracy of analysis results by examining the effect of student-level sample weights on the process of identifying key variables with high predictive power for estimating reading comprehension achievement in PISA 2018. To this end, analyses will be conducted using student-level sample weights in models created with data obtained from Turkey, employing both Classification and Regression Tree (CART) and Random Forest (RF) methods, which are data mining (DM) techniques. The study aims to guide researchers by ensuring the accuracy of results when selecting the most important independent variables, thereby optimising data mining performance. To this end, it aims to implement micro and macro reforms, such as changes in curriculum at the macro level in countries' education policies, changes in teaching and learning methods, changes in assessment and measurement approaches, and micro and macro reforms targeting disadvantaged groups, and to increase the accuracy of analyses to be made to increase the accuracy of decisions to be taken at the micro level regarding textbooks and materials, software programmes, and changes in local school culture (Addey et al., 2017).

The research questions that guide the current study are as follows:

- 1) When the weight variable is taken into consideration in the model created by the Classification and Regression Tree method, how are the important variables that predict the achievement in PISA affected?
- 2) When the weight variable is taken into consideration in the model created by the Random Forest method, how are the important variables that predict the achievement in PISA affected?
- 3) When the weight variable is included in the model, how are the classification and prediction performances of the models created by the Classification and Regression Tree and Random Forest method affected?

Methods

Research Type

The aim of the study is to examine the effect of sample weights at the student level in the Turkish sample in the process of determining the variables that are important in predicting PISA reading comprehension achievement in two categories (successful and unsuccessful) with scales measuring students' affective characteristics and questionnaires measuring sociodemographic characteristics. In this context, the research design can be expressed as a relational quantitative research design (Büyüköztürk et al., 2018).

Study Population and Sample

In line with the aims of the study, the sample of the study consists of 6,890 students attending 186 schools representing 12 regions of Turkey. This sample was selected using stratified sampling method from the universe of 1,038,993 students, which constitutes the 2018 Turkey PISA sample (MEB, 2019).

Data Collection Process

Research data were obtained from the following source: <http://www.oecd.org/pisa/data/2018data-base/>. In the study, a total of 34 independent variables were derived using the data obtained from the

2018 PISA student survey. PV1, one of the ten possible values obtained from the reading comprehension test and representing the reading comprehension achievement level, was used as the dependent variable.

Data Collection Tools

In the study, data obtained from the reading comprehension test and student questionnaire in PISA 2018 were used. The PV1 value obtained from the reading comprehension test was selected as the dependent variable. PV1 is a quantitative and continuous variable and represents one of the ten possible values (PV1, PV2, ..., PV10) assigned to each student according to their performance in the PISA 2018 reading comprehension achievement test. Wu's (2005) finding that using any of the plausible values accurately estimates the population parameters supports the choice of PV1 as the dependent variable in this study. Data from the PISA 2018 student survey were used to derive independent variables.

Data Analysis

SPSS Modeler and WEKA programmes were used for data analysis. Excel and SPSS programmes were used as supporting tools to transfer the data to SPSS Modeler and WEKA and to calculate some statistics. Outlier analysis and missing data analysis were performed using SPSS software. As a result of the analysis, no outliers were detected, but missing data were detected. In order to eliminate missing data, multiple assignment method was applied in SPSS.

In the study, the reading skills proficiency level table in the PISA 2018 Turkey preliminary report was used to classify PV1 scores and to create the categorical dependent variable (MEB, 2019). According to the table, PV1 values were classified as 'unsuccessful' for scores between 0 and 552,999 and 'successful' for scores between 553 and 1000, and a categorical dependent variable was obtained. The independent variables consist of 34 variables in the student questionnaire.

In this study, CART (Classification and Regression Tree) and RF (Random Forest) data mining classification and prediction methods in SPSS

Modeler programme were used to evaluate the performance of independent variables in classifying and predicting the dependent variable. The analysis was performed twice for each method. In the first analysis, the weight variable was included due to the structure of the PISA data. In particular, the weight variable W_FSTUWT (Final Trimmed Nonresponse Adjusted Student), which shows the weight of each student in the data set, was included in the analysis. In the second analysis, this weight variable was excluded. Thus, both weighted and unweighted analyses were performed using CART and RF methods, taking into account the 34 independent variables and the predictor importance values calculated by each method. The first 10 important independent variables that best predicted success were identified. Following this, performance criteria were calculated in the Weka programme using all data, 10-fold cross-validation data and test data. These calculations were based on the significant independent variables selected by each model, both with and without weighting variables.

Student-Level Sample Weights

Let the student-level sample weight be j , the probability of selection of a school be P_j and the probability of the student i in the school j to be selected when the school j is selected be P_{ij} , the student-level in-school weight be $w_j = 1/P_{ij}$ and the school-level weight be $w_{ij} = 1/P_j$, then the student-level sample weight is obtained with the formula $W = [(w_j) \times (w_{ij})]$. For example, let's assume that the first five schools are randomly selected from a main population of 500 students in 10 schools with 50 students in each. Then, 10 students from each school will be selected separately and the sample size will be 50 students. Since 5 schools are selected from 10 schools, the probability of each school being selected will be $P_j = 5/10 = 0.50$, so the school weight will be $w_j = 2$. Since the probability of each student being selected from among the 5 selected schools will be $P_{ij} = 10/50 = 0.20$, the in-school weight will be $w_{ij} = 5$. Finally, the student-level sample weight will be $W = 2 \times 5 = 10$. It is a necessity to consider these weights in all the analyses made with PISA data, which is one of the large-

scale tests. In analyses based on multi-stage sampling, sample weights of school level, grade level and student level should be handled separately according to the stages (Rutkowski et al., 2010). In this study, the student level sample weights found in the PISA 2018 data set were used in the W_FSTUWT (Final trimmed nonresponse adjusted student weight) variable in PISA.

Performance Criteria

Finally, in the comparison of the results, the following absolute performance criteria; Correct Classification Rate (CCR), Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) and the following relative performance criteria; Kappa (κ) coefficient, Relative Root Mean Square Error (RRMSE) and Relative Absolute Error (RAE) (Tabachnick & Fidel, 2007; Field, 2009) were calculated separately for each data mining method and the results of the methods were compared with each other.

Findings

Findings for The First Research Problem

The graph of the 10 variables with high predictor importance selected with the CART model using the weight variable is given in Figure 1.

Predictor Importance

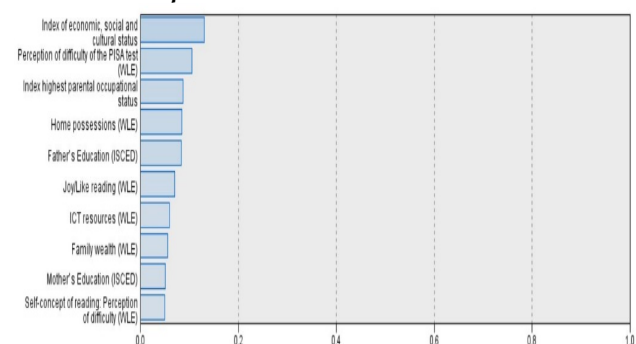


Figure 1. The resulting CART model when the weight variable is used

According to the findings obtained from Figure 1, when the weight variable is included in the analysis using the Classification and Regression Tree (CART) method, index of economic, social and cultural status (ESCS) index was identified as the

most important variable in predicting reading comprehension achievement in the PISA assessment. Following this, the variables with the highest importance in predicting reading achievement are as follows: Perception of difficulty of the PISA test, Index of highest parental occupational status, Home possessions, Father's education, Reading enjoyment, ICT resources, Family wealth, Mother's education, Self-concept of reading. These findings suggest that the ESCS index is a very important factor, emphasizing the strong role of socioeconomic factors in influencing students' reading comprehension performance. Other factors such as Perceived difficulty of the PISA test, Highest parental occupational status index, Home possessions also play an important role in predicting achievement.

The graph of the 10 variables with high predictor importance selected with the CART model without using the weight variable is given in Figure 2.

Predictor Importance

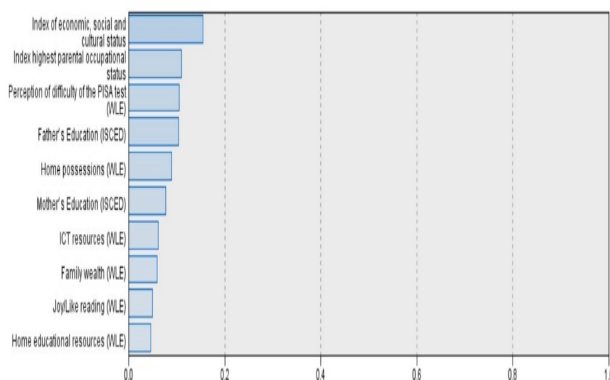


Figure 2. CART model without the weight variable

According to the findings in Figure 2, when the weight variable is not included in the analysis using the Classification and Regression Tree (CART) model, index of economic, social and cultural status (ESCS) variable continues to be the most important variable in predicting reading comprehension achievement. However, in this case, the order of importance of the variables differs slightly compared to the case where the weight variable is included. The order of the predictor importance of the variables from highest to lowest: Index of economic, social and cultural status (ESCS), Index of highest parental occupational status, Perception of the difficulty of the PISA test, Father's education,

Home possessions, Mother's education, ICT resources, Family wealth, Reading enjoyment, Home educational resources. These findings show that socioeconomic factors (such as ESCS and Highest parental occupational status index) continue to be the most influential factors in predicting reading comprehension even without the weight variable. On the other hand, other variables such as father's education and Home possessions continue to play an important role, while home educational resources and Reading enjoyment are slightly less important in this model.

When the weight variable was used in the Classification and Regression Tree model and when it was not used, some differences emerged between the 10 variables with high predictor importance selected by the models. One of these differences was Self-concept of reading variable related to reading in the model where the weight variable was used, while the other was home educational resources in the model where the weight variable was not used. In addition, another difference is that the importance levels of the covariates with high predictive importance selected by the two models are different. According to the findings obtained, it was determined that the variables that differed between the two models were the variables with the lowest predictive importance level.

Findings for The Second Research Problem

The graph of the 10 variables with high predictor importance selected with the RF model using the weight variable is given in Figure 3

Predictor Importance

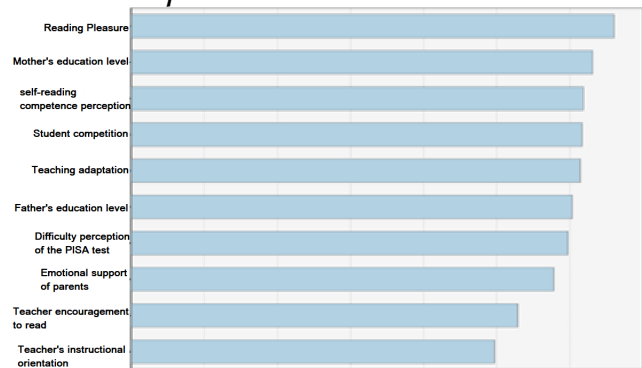


Figure 3. The resulting RF model when the weight variable is used

When Figure 3 is examined, in the Random Forest model created with the weight variable, it was

determined that the most important variable in predicting PISA reading comprehension achievement is reading pleasure, followed by the mother's education level, self-reading competence perception, student competition, teaching adaptation, father's education level, difficulty perception of the PISA test, emotional support of parents, teacher encouragement to read, and the teacher's instructional orientation.

The graph of the 10 variables with high predictor importance selected with the RF model without using the weight variable is given in Figure 4.

Predictor Importance

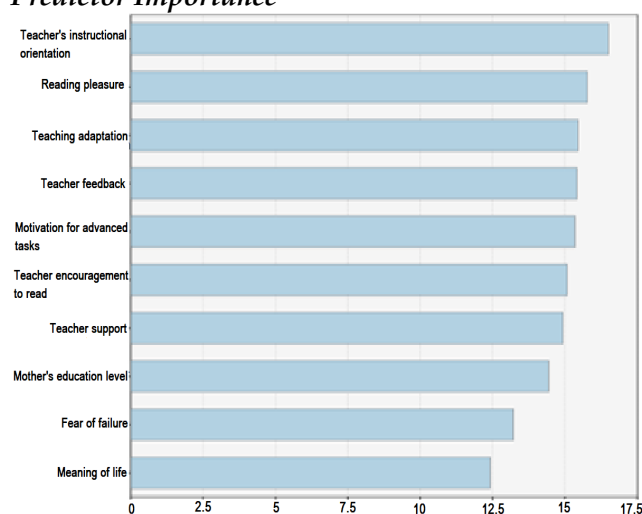


Figure 4. RF model without the weight variable

When Figure 4 is examined, it is observed that when the weight variable is not included in the Random Forest model, the teacher's instructional orientation is the most important variable in predicting PISA reading comprehension achievement, followed by the variables of reading pleasure, teaching adaptation, teacher feedback, motivation for advanced tasks, teacher encouragement to read, teacher support, mother's education level, fear of failure, and meaning of life.

When the model constructed with the weight variable using the random forest method was compared with the model constructed without the weight variable, five of the 10 predictor variables remained the same, but the predictor significance levels of these covariates differed between the two models. The common variables in both models are reading pleasure, mother's education level, teaching adaptation, teacher's encouragement to read

and teacher's instructional orientation. The variables that differ in the model constructed by using the weight variable are self-reading competence perception, student competition, father's education level, difficulty perception of the PISA test and emotional support of parents. The variables that differed in the model without the weight variable were teacher feedback, motivation for advanced tasks, teacher support, fear of failure and meaning of life.

In the light of the findings obtained, it was determined that only one variable differed among the 10 variables with predictive importance selected in the CART model with and without the weight variable, while the importance levels of the other covariates differed. On the other hand, in the RF model with and without the weight variable, it was determined that 10 variables with predictive importance differed significantly between the two models. Accordingly, it was determined that the use of the weight variable caused a difference in determining the variables predicting reading comprehension achievement in both CART and RF methods. The weight variable caused the most difference in the RF model. Because in the CART model, the variable with the highest predictive importance when the weight variable was used and when the weight variable was not used was the socio-economic status index, while in the RF model, the variable with the highest predictive importance when the weight variable was used was reading pleasure, and the variable with the highest predictive importance when the weight variable was not used was the teacher's instructional orientation.

Findings for the Third Research Problem

Using CART and RF methods in WEKA program, performance calculations were made on the basis of 10 independent variables that have the highest predictor importance in predicting reading comprehension achievement in PISA among 34 variables, with and without including the weight variable. The results are presented in Table 1 and Table 2

Table 1. CART Model Performance Criteria for the Analyses with and without the Weight Variable

		Absolute Performances				Relative Performances		
	Variable	Data	PCC	MAE	RMSE	Kappa	RAE	RRSE
Weighted	important variables (10)	All data	85.755	0.219	0.331	0.314	79.455	89.148
		Validity data	83.423	0.230	0.355	0.206	83.685	95.782
		Test data	83.567	0.230	0.355	0.206	83.926	96.392
Unweighted	important variables (10)	All data	85.887	0.213	0.326	0.346	77.320	87.942
		Validity data	84.021	0.232	0.354	0.227	84.239	95.412
		Test data	84.090	0.230	0.349	0.281	83.970	91.861

According to the data in Table 1, it was observed that the classification and prediction performance of the CART model remained almost the same and at a high level in all data, regardless of whether the weight variable was included in the model or not. However, some differences were observed in the classification and prediction performance of the model, especially for validity and test data. Although there was a slight decrease in classification and prediction performance when the weight variable was included in the model, high classification and prediction performance was still obtained for both validity and test data. On the other hand, when the Kappa coefficient was analysed, it was observed that the coefficient decreased slightly when the weight variable was included but remained at an acceptable level. In this case, it can be stated that the inclusion of the weight variable slightly decreases the reliability of the model.

However, it was determined that the Kappa coefficient of the model with and without the weight variable was very high for all data, but low for validity and test data. As a result, it can be said that the reliability of the model is low for validity and test data regardless of whether the weight variable is included or not.

When the effect of the weight variable on the prediction performance of the models constructed with Classification and Regression Tree (CART) and Random Forest (RF) methods was analysed, a slight decrease in the prediction performance of both methods was observed when the weight variable was included in the model.

On the other hand, the Kappa coefficient was found to be reasonable for all data, validity and test data in the analyses conducted with the CART method. In contrast, the RF method gave a very high Kappa coefficient for all data, but lower results were observed for validity and test data.

Table 2. RF Model Performance Criteria for the Analyses with and without the Weight Variable

			Absolute Performances			Relative Performances		
Variable		Data	PCC	MAE	RMSE	Kappa	RAE	RRSE
Weighted	important variables (10)	All data	100	0.08	0.128	1	31.481	34.681
		Validity data	83.773	0.238	0.347	0.186	86.254	93.501
		Test data	84.005	0.237	0.343	0.220	86.388	93.253
Unweighted	important variables (10)	All data	100	0.091	0.131	1	33.212	35.458
		Validity data	84.006	0.248	0.352	0.154	90.207	94.902
		Test data	84.219	0.246	0.349	0.164	89.766	94.808

When Table 2 is analyzed, it is seen that the classification and prediction performance of the RF method is almost the same and very high for all data, regardless of whether the weight variable is included in the model or not. However, some changes were noted in the classification and prediction performance of the RF method, especially in the case of validity and test data. Although there is a slight decrease in prediction performance when the weight variable is included in the model, a high level of classification and prediction performance is obtained with or without the weight variable.

As a result, RF method gave more reliable results in analyses with all data, while CART method gave more reliable results in analyses with validity and test data.

Discussion and Conclusion

In the study, it was aimed to examine the effect of the weight variable in the process of determining the variables predicting reading comprehension achievement in PISA 2018 with data mining methods. As a result of the analyses conducted with CART and RF methods, it was concluded that the

use of the weight variable affects the variables predicting PISA reading comprehension achievement and the importance levels of these variables. In particular, the inclusion of the weight variable in the model in the RF method caused the variables that are important in terms of predictivity to differentiate in the established model. This result is consistent with the findings of Grilli and Monica Pratesi (2004). On the other hand, when the weight variable is used, the forecasting performance of the models constructed with the RF and CART methods decreased insignificantly. However, in contrast to this study, Pfeffermann et al. (1998) find that the use of the weight variable does not have a significant disadvantage in terms of bias or precision. The work of Kish (1992) has important implications for the correct application of weights in data analysis and their impact on variance and bias. Consideration of weights is critical to obtain more accurate and reliable results, especially in the case of unequal selection probabilities. In this case, the consideration of weights may affect the order of importance of predictor variables.

In the Classification and Regression tree model, the socio-economic and cultural status index variable emerged as the most important variable in predicting PISA reading comprehension achievement with and without the weight variable in the model. Similar to this result, OECD (2019) Socioeconomic status is one of the main factors affecting students' reading comprehension achievement. Students with higher socioeconomic status generally show higher reading achievement. This is due to the influence of family resources, educational materials and supportive environments. A similar result is found in OECD (2013) Socio-economic status is an important determinant of student achievement. Another study shows that socio-economic status has a significant effect on reading achievement (Chiu & McBride-Chang, 2010).

In the light of this information, the emergence of the socio-economic and cultural status index variable as the most important variable predicting success in the Classification and Regression tree model according to whether or not to include the weight variable in the model is an indication that the models created are both consistent with each

other and give correct results. According to this result, it is supported that using a weight variable gives correct results. Furthermore, the ability of socioeconomic background to predict student achievement cannot be generalised and emphasises the importance of country-specific approaches (Rutkowski et al., 2013). This perspective supports the necessity of using a weight variable in the constructed model. However, the socio-economic and cultural status index variable did not emerge as a significant variable in predicting PISA reading comprehension success in the Random Forest model, regardless of whether the weight variable was used in the model or not. The fact that the socio-economic and cultural background index variable does not emerge as a significant variable in predicting PISA reading comprehension success in the Random Forest model is due to the Random Forest method showing some important variables as insignificant because of mechanisms such as inter-variable correlation, random subsampling, and split selection. This situation stems from limitations in the method's variable importance calculation.

In the Classification and Regression tree model, when the weighting variable was used in the model, the perception of difficulty of the PISA test was the second most important variable in predicting achievement, while it was the third most important variable when the weighting variable was not used. These findings show how taking weighting into account in the analysis can change the results. Weighting is used to correct for sampling biases and to represent the population more accurately. The inclusion of a weighting variable in the analysis allows sampling units to better reflect their representation in the population (OECD, 2009). Similarly, Kish (1992) emphasised the negative effect of large weights on variance. He suggests that weights should be balanced or smoothed to reduce this effect.

The two models constructed by the Classification and Regression tree method with and without the weight variable confirm that the PISA test difficulty perception variable emerges as an important variable in predicting achievement. A finding similar to this finding is that although students' perception of test difficulty during the test has an

effect on test anxiety, perceived test difficulty does not have a direct effect on test performance, but has an indirect effect mediated by anxiety, suggesting that test performance is not directly affected by how students perceive test difficulty, but that the anxiety aroused by the perception of difficulty affects test performance (Hong, 1999). Accordingly, it can be said that both models constructed in terms of the difficulty perception variable of the PISA test are largely consistent and the use of the weight variable gives the correct result.

In the model constructed with the Classification and Regression tree method using the weight variable, the variable of the highest professional status of the parents emerged as the third important variable in predicting achievement, while it emerged as the second important variable in the model constructed without using the weight variable. This finding is consistent with the finding of Shah and Hussain (2021) that parents' occupational status is an important factor affecting students' academic development and progress. In addition, the use of the weight variable changed the order of predictor importance of one of the predictor variables, the highest professional status of parents, in the models. Accordingly, it can be said that in terms of the highest professional status of the parents variable, both the two models are largely consistent, and the use of the weight variable gives the right result.

In the Random Forest model, when the weight variable was used, the variable of reading enjoyment emerged as the most important variable in predicting PISA reading comprehension achievement, whereas when the weight variable was not included in the analysis, the variable of teacher's directing education emerged as the most important variable in predicting PISA reading comprehension achievement. According to Warm (1989), not taking weights into account may negatively affect the generalizability and accuracy of the results. This can be seen in the fact that the teacher's instructional guidance variable emerged as a more important predictor in the unweighted analysis, because when weights are ignored, the importance of this variable may be exaggerated.

Enjoyment of reading is definitely an example of intrinsic motivation. Since individuals who enjoy reading will read more, their reading comprehension achievements will be positively affected

(Cunningham & Stanovich, 1998). The fact that the reading enjoyment variable was the most important predictor variable in the model created based on the random forest method in which the weight variable was used can be considered as an indicator that using the weight variable gave the right result. On the other hand, the reading enjoyment variable was not found to be an important variable in the Classification and Regression tree model with and without the weight variable. However, the variable joy / like reading, which is similar to this variable, emerged as an important variable. The effectiveness of the reading enjoyment variable in the Random Forest method, which collectively evaluates variable effects through multiple trees and random sub-variable selection and uses weight variables, has increased the importance of the reading enjoyment variable by improving the representation of individuals. On the other hand, since the Classification and Regression Tree (CART) method proceeds through a single tree, the effect of some variables is shared with other variables, making the effect of the reading enjoyment variable appear insignificant.

While only one of the 10 variables selected by the model is different in the analysis performed with and without the weight variable with the CART method, five of them are different in the RF method. As a result, it was found that using the weight variable had more effect on the analysis performed with the RF method. On the other hand, when the classification and prediction performances of the RF method and the CART method are compared, although there is a slight decrease in the classification and prediction performance of both methods when the weight variable is used, the classification and prediction performances of the methods are high for both cases. In the case where the weight variable is included in the analysis, when the classification performances of the models are compared by considering the error criteria and Kappa coefficient for all data, it is determined that the RF method has a higher performance.

The classification and prediction performance of the RF method for all data was found to be excessively high when compared to the results obtained from validation and test data, which is considered a problem known as "overfitting" in data

mining (Domingos, 2012). Performing analyses on the same dataset can lead to issues such as overfitting, biased predictions, and high variance (Domingos, 2000). The best way to address this issue is to conduct analyses with validation data (Ng, 1997). When the weight variable was included in the analysis, the classification and prediction performances of models created using the RF and CART methods on validation data, as well as the Kappa coefficient, were examined, and it was found that both methods showed high classification and prediction performance. However, the Kappa coefficient was found to be low in the model created with the RF method, while it was at a reasonable level in the model created with the CART method. As a result, the CART method provided more reliable and valid results for the validation data.

In conclusion, the findings of this study emphasize the critical role of incorporating sample weights in educational research. Ignoring weights can produce biased estimates and lead to misleading policy implications, whereas their inclusion provides more accurate and representative outcomes. Although weighting slightly reduces prediction performance in CART and RF models, it ensures that variable importance and model interpretations better reflect the target population. Overall, the findings highlight the necessity of incorporating sample weights to ensure valid and reliable results in large-scale educational data mining.

Declarations

Funding: *No funding was received for conducting this study.*

Conflicts of Interest: *The authors declare no conflict of interest.*

Ethical Approval: *This article does not involve any studies with human participants or animals conducted by the authors. Therefore, ethical approval was not required.*

Informed Consent: *Not applicable.*

Data Availability: *The data used in this study are publicly available from the OECD PISA 2018 database (<http://www.oecd.org/pisa/data/2018database/>).*

Authors' Contributions: *Both authors contributed to the conception, design, analysis, and writing of the study. All authors have read and approved the final version of the manuscript.*

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