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EDITORIAL

Dear Readers,

We have introduced the second issue of 10th volume of the journal published in November 2024.

The acceptance rate of Current Research in Social Sciences Volume 10, Issue 2 was 26,9%, and I would like to thank to the authors, referees, members of the editorial board and editors who took part in the publication process of the journal. See you in our next issues.

Greetings and regards.

Asst. Prof. Dr. Duygu TÜRKOĞLU
University of Health Sciences Turkey
Department of Management and Organization

EDİTÖRDEN

Sevgili Okurlar,

2024 yılı Kasım ayında yayınlanan dergimizin onuncu cildinin ikinci sayısını sizlere sunmuş bulunuyoruz.

Current Research in Social Sciences 10. Cilt 2. Sayısının kabul oranı %26.9 olup, derginin yayın sürecinde yer alan yazar, hakem, yayın kurulu üyeleri ve editör arkadaşlarıma teşekkür etmek isterim. Sonraki sayılarımızda görüşmek üzere.

Selam ve saygılarımla.

Dr. Öğr. Üyesi Duygu TÜRKOĞLU
Sağlık Bilimleri Üniversitesi
Yönetim ve Organizasyon Bölümü

REVIEW ARTICLE

Enhancing Emotion Regulation:
A Review of tDCS Effects

Duygu Düzenlemesinin Geliştirilmesi: tDCS Etkilerinin İncelenmesi

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Abstract

Transcranial direct current stimulation (tDCS) has demonstrated increasing promise as a method of modifying brain activity and cognitive function. The objective of this comprehensive review of the literature is to evaluate the impact of tDCS on explicit and implicit emotion regulation strategies. An extensive review of the literature, conducted using keywords "tDCS," "emotion regulation," "implicit emotion regulation," and "explicit emotion regulation" in Google Scholar, PubMed, Scopus, and Web of Science databases, identified studies meeting the inclusion and exclusion criteria. Twenty studies overall, encompassing both implicit-automatic and explicit-controlled emotion regulation strategies, were found after an extensive review of the literature. There has been a lot of research conducted on explicit emotion regulation, however not as much on implicit emotion regulation. The review revealed that tDCS administration has demonstrated promising effects on enhancing emotion regulation performance across various tasks and neural targets. Nevertheless, inconsistencies in the literature highlight the necessity for further research to elucidate the precise mechanisms underlying tDCS-induced changes in emotion regulation, as well as to explore individual differences in treatment response. In conclusion, this review highlights the potential of tDCS as a valuable intervention for enhancing emotion regulation processes, with implications for both clinical practice and basic research in affective neuroscience.

Keywords: Neuropsychology, tDCS, Explicit Emotion Regulation, Implicit Emotion Regulation.

Öz

Transkraniyal doğru akım stimülasyonu (tDCS), beyin aktivitesini ve bilişsel fonksiyonu değiştirme yöntemi olarak artan bir umut vaat etmektedir. Bu kapsamlı literatür taramasının amacı, tDCS'nin açık ve örtük duygu düzenleme stratejileri üzerindeki etkisini değerlendirmektir. Google Scholar, PubMed, Scopus ve Web of Science veritabanlarında "tDCS", "duygu düzenleme", "örtük duygu düzenleme" ve "açık duygu düzenleme" anahtar kelimeleri kullanılarak yapılan kapsamlı bir literatür taraması, dahil etme ve dışlama kriterlerini karşılayan çalışmaları belirlemiştir. Kapsamlı bir literatür taramasının ardından, hem örtük-otomatik hem de açık-kontrollü duygu düzenleme stratejilerini içeren toplamda yirmi çalışma bulunmuştur. Açık duygu düzenleme üzerine birçok araştırma yapılmış olmasına karşın, örtük duygu düzenleme üzerine o kadar fazla araştırma yapılmamıştır. İnceleme, tDCS uygulamasının çeşitli görevler ve nöral hedefler üzerinde duygu düzenleme performansını artırmada umut verici etkiler gösterdiğini ortaya koymuştur. Bununla birlikte, literatürdeki tutarsızlıklar, tDCS'nin duygu düzenlemedeki değişikliklere neden olan kesin mekanizmaları açıklığa kavuşturmak ve tedaviye yanıt veren bireysel farklılıkları araştırmak için daha fazla araştırmaya duyulan ihtiyacı vurgulamaktadır. Sonuç olarak, bu inceleme, tDCS'nin duygu düzenleme süreçlerini geliştirmede değerli bir müdahale olarak potansiyelini vurgulamakta olup, hem klinik uygulamalar hem de duygusal sinirbilim alanındaki temel araştırmalar için önemli etkileri bulunmaktadır.

Anahtar Kelimeler: Nöropsikoloji, tDCS, Örtük Duygu Düzenleme, Açık Duygu Düzenleme.

Enhancing Emotion Regulation: A Review of tDCS Effects

Transcranial direct current stimulation (tDCS) is a non-invasive brain stimulation technique that uses subthreshold anode or cathode stimulation to modulate neural responses. This method affects mood or cognitive abilities by inducing long-term potentiation or short-term depression at the synaptic level. Therefore, tDCS has been utilized in the treatment of psychopathologies, such as mood disorders. Ongoing research is exploring the potential of tDCS in this area (Clarke et al., 2020).

Emotion regulation, which is relevant to both mood disorders and cognitive ability, has also been the subject of tDCS studies in order to maintain an individual's functionality, emotion regulation entails controlling the degree, frequency, and duration of emotional states (Chen et al., 2023). The literature identifies several kinds of emotion regulation (Braunstein et al., 2017). This in-depth review considers two types of emotion regulation strategies: explicit and implicit. Implicit emotion regulation is defined as a process that affects the character, strength, or duration of an emotional reaction without requiring deliberate involvement or stated goals. In contrast, explicit emotion regulation techniques entail a conscious endeavor to alter an individual's emotional state (Koole & Rothermund, 2011). Implicit emotion regulation strategies include extinction, reinforcer revaluation, and reversal learning. These strategies have been studied using the Emotional Stroop Task and the Go/No-Go Task. On the other hand, explicit emotion regulation strategies include reappraisal, selective attention, distraction and placebo.

The neuroscience of emotion regulation has been studied using functional neuroimaging methods (Sebastian & Ahmed, 2018). Studies focusing on brain lesions have emerged as a critical element in advancing our understanding of the neural mechanisms and cognitive aspects involved in emotion regulation (Turnbull & Salas, 2021). Research consistently indicates that while the prefrontal cortex and its associated areas are implicated in the regulatory processes of emotion, subcortical regions such as the amygdala are pivotal in the generation of emotions (Morawetz et al., 2020). From this perspective, emotion regulation is assumed to operate under the premise that the frontal brain regions exert control over the subcortical regions responsible for emotion generation (Min et al., 2022).

The aim of this systematic review is to assess whether experimental studies have shown enhanced emotion regulation abilities through the application of tDCS to neural networks associated with both explicit and implicit emotion regulation strategies. Earlier studies have identified a relationship between tDCS and a range of psychiatric disorders (Kekic et al., 2015). This review, however, focuses on the impact of tDCS on emotion regulation, aiming to provide a more comprehensive approach. Many psychiatric illness models emphasize the central role of emotion regulation, which is considered a core mechanism underlying various psychological disorders. The term "transdiagnostic" refers to processes or factors, like emotion regulation, that are not specific to a single diagnosis but instead influence a broad spectrum of psychological conditions. Emotion regulation, therefore, is widely recognized as a critical transdiagnostic factor contributing to the development and maintenance of multiple psychiatric disorders (Kraiss et al., 2020).

Theoretical Framework

tDCS as A Tool for Modulation Cognitive Function

Non-invasive brain stimulation (NIBS) techniques allow neuronal activity in the healthy human brain to be regulated both spatially and temporally (Bergmann & Hartwigsen, 2021). One non-invasive brain stimulation technique for subthreshold modification of neuronal activity and cognitive function is tDCS. An electrical stimulator that delivers a steady, isolating current coupled to two electrodes, an anode, and a cathode makes up the tDCS equipment. According to Kelley et al. (2019), these electrodes are applied to the scalp above the cortical areas of interest. Using scalp electrodes, tDCS applies a low,

continuous electrical current (amplitude <2 mA) to alter brain activity. Following stimulation, its effects last for over an hour (Das et al., 2016). Despite its potential benefits, tDCS is associated with several common side effects, including mild skin irritation, tingling sensations, itching under the electrodes, and in some cases, transient headache or fatigue. These side effects are generally well-tolerated and diminish shortly after stimulation (Wysokiński, 2023).

The stimulation delivered in tDCS is subthreshold, meaning it is too weak to generate action potentials at the level of the transmembrane neuronal potential. Instead, it causes small changes that can either increase or decrease the likelihood of a neuronal response (Nejati et al., 2022). Anodal transcranial direct current stimulation has been demonstrated to improve neuronal excitability in the target brain region by depolarizing neurons, which makes them prone to produce action potentials. Increased neuronal excitability could enhance cognitive performance by increasing the efficacy of neural networks involved in working memory, inhibition, flexibility, and theory of mind (Concerto et al., 2017; Pisoni et al., 2018). Improvements in reaction times and accuracy across various cognitive tasks observed after anodal tDCS treatments lend support to the theory that enhancing neuronal excitability promotes faster and more accurate cognitive processing. Anodal tDCS achieves this by applying a positive electrical current to the targeted brain area, which depolarizes the neuronal membrane, lowering the threshold for action potential generation and increasing the likelihood of neuronal firing. This mechanism is thought to facilitate neural activity in underactive brain regions. On the other hand, cathodal tDCS applies a negative electrical current, leading to hyperpolarization of the neuronal membrane. This increases the action potential threshold, reducing neuronal excitability and dampening neural activity. This inhibitory effect is often utilized to suppress overactive circuits or rebalance abnormal brain activity patterns (Narmashiri & Akbari, 2023). According to Kelley et al. (2019), tDCS interacts with a variety of complex synaptic mechanisms, including long-term potentiation (LTP) and long-term depression (LTD), which are key processes underlying synaptic plasticity. LTP refers to a sustained increase in synaptic strength that occurs when neurons are frequently and strongly activated together, often described as the cellular basis of learning and memory. This mechanism enhances the efficiency of synaptic transmission, allowing for more robust communication between neurons (Pisoni et al., 2018). Conversely, LTD is a process that weakens synaptic strength over time, typically occurring when neuronal activity is less frequent or weaker. This reduction in synaptic efficacy is essential for neural network remodeling, enabling the brain to filter out less relevant information and maintain overall balance in synaptic activity (Edelmann et al., 2017; Ibrahim et al., 2021). Through these mechanisms, tDCS is believed to modulate neural plasticity and influence cognitive and behavioral outcomes (Cavaleiro et al., 2020; Vitureira et al., 2013). This approach influences cognitive functions and brain activity by enhancing hyper-communicative activity through the anode and reducing hypo-communicative activity through the cathode. The prolonged application of stimulation leads to sustained alteration of brain excitability and plasticity, which can manifest in one of two ways: potentiation or depression. This is dependent on the polarity of the stimulation. Nejati et al. (2022) observed that tDCS-induced changes in excitability and plasticity significantly modulate brain activity in various processes, affecting cognitive functions and brain processes. This interaction highlights the potential of tDCS in influencing and understanding brain functionality and cognitive health.

Understanding Emotion Regulation Strategies and Its Neural Mechanisms

According to a functionalist and evolutionary perspective, emotions serve as a tool with significant and adaptive roles that affect decision-making, prepare individuals for 'fight or flight' responses, and facilitate social communication. Consistent with this perspective, the current understanding is that emotions are not fixed and automatic, but rather can be modulated through emotion regulation. The process of emotion regulation entails people controlling their feelings in order to perform properly in a

variety of social contexts (Wheeler et al., 2017).

Emotion regulation is a complex and multidimensional structure. Therefore, the literature discusses and classifies emotion regulation strategies from various perspectives, including psychological, physical, cognitive, and developmental perspectives (Gyurak et al., 2011). Emotion regulation may occur automatically (implicit emotion regulation) or intentionally (explicit emotion regulation), according to the cognitive framework of emotion regulation. Explicit emotion regulation involves deliberate attempts to control emotional responses and requires close monitoring, whereas implicit emotion regulation originates spontaneously and has goals unrelated to conscious emotional response modification (Qiu et al., 2023).

According to Braunstein and colleagues (2017), the explicit and implicit strategies to emotion regulation are reinforced by one aspect that includes shifting the nature of the emotion regulation process from automatic to controlled. The study suggests four possible methods for emotion regulation: implicit-controlled, implicit-automatic, explicit-controlled, and explicit-automatic.

As mentioned earlier, explicitly controlled emotion regulation strategies entail conscious awareness and deliberate regulation. Within this framework, the literature has highlighted three distinct explicit emotion regulation strategies that have garnered researchers' interest. The first strategy is selective attention, which involves focusing on or shifting away from specific features of affective stimuli (Braunstein et al., 2017). Attentional states can influence what is attended to, which in turn can impact emotional states. However, individuals possess the ability to intervene in and regulate both processes to some degree. By employing motivational techniques and imparting instruction on emotion regulation strategies, individuals can successfully prioritize positive stimuli over negative ones, thereby promoting an increase in positive affect (Livingstone & Isaacowitz, 2017). The process of selective attention involves modulating activity in salience processing areas, such the amygdala, by means of dlPFC and ACC (anterior cingulate cortex) activation. The results of research on clinical attention training indicate that selective attention is a viable explicit method for emotional regulation The studies illustrate that the implementation of this strategy can lead to increased activation of the prefrontal cortex (PFC), while simultaneously decreasing activation in regions linked to salience processing (Sean et al., 2017).

Distraction is the second explicit emotion regulation strategy that has received attention (Braunstein et al., 2017). Distraction is a technique for controlling emotions that entails concentrating on various elements of a circumstance or turning one's whole attention to something else (Kobayashi et al., 2021). Studies have documented activation in the dlPFC, vlPFC and right insula during the regulation of emotions through distraction. Previous research has demonstrated that these brain regions can modulate the activity of the amygdala or insula, which are regions involved in emotion generation, through cognitive emotion regulation (Jentsch et al., 2019).

Cognitive reappraisal is the third commonly employed explicit emotion regulation strategy (Braunstein et al., 2017). Reassessing a scenario and its importance in order to control emotions is known as cognitive reappraisal. Given the use of this technique, people can reframe events such that the emotional effect of the situations is reduced or altered. Cognitive reappraisal is frequently utilized as a means to mitigate negative affect. However, it can also serve to amplify positive affect or sustain neutral emotional states (Walker et al., 2022). The predominant focus of research on the neural networks and neurobiology underlying explicit emotion regulation stems from investigations into the reappraisal technique (Braunstein et al., 2017). One section of the neural networks engaged in cognitive reappraisal is the extensive cortical-subcortical network. Collectively, the frontal and parietal regulatory regions decrease activity in important subcortical emotion processing regions, such the amygdala. According to research, during cognitive reappraisal, specific brain regions are frequently activated. These regions include the dorsolateral prefrontal cortex (dlPFC), ventromedial prefrontal cortex (vmPFC),

ventrolateral prefrontal cortex (vlPFC) and dorsal anterior cingulate cortex (dACC) (Steward et al., 2020). The dlPFC is essential for executive function because it enables the active processing of information required to reevaluate emotional stimuli. In a comparable manner, response selection and the suppression of emotional responses are crucial functions of the vlPFC and right dlPFC (Picó-Pérez et al., 2019). This inhibitory control is essential for overcoming the natural desire to evaluate a stimulus negatively when reappraising a highly stimulating stimulus (Silvers et al., 2014). The dACC and nearby dmPFC are activated by distraction and reappraisal. These areas keep an eye out for discrepancies between desired and actual behavioral results, signaling when administration has to be adjusted accordingly. Reappraisal studies have associated the anterior regions of the dmPFC to mentalizing, which has been proposed to be a critical function. These studies support individuals in monitoring and reflecting on their own emotional states, as well as reflecting on and reinterpreting the mental states of external stimuli (Bachmann et al., 2018). Given its anatomical and functional closeness to subcortical regions involved in emotion generation, the vmPFC is crucial in controlling emotional response. The requirements made upon intrinsic (self-directed) and extrinsic (task-oriented) processing during emotion regulation alter vmPFC activity. The vmPFC is recognized for being essential in managing the transition from passive, self-focused processing to actively generating reappraisals of negative stimuli (Steward et al., 2020).

Based on the explicit emotion regulation framework developed by Braunstein and colleagues (2017), the explicit-controlled emotion regulation method is where these three explicit techniques belong in. Explicit-controlled emotion regulation actually refers to the explicit strategies of emotion regulation that are most frequently used in the literature. Explicit-automatic emotion regulation, on the other hand, bases control on automatic processes and has an explicit goal of regulating emotions. Despite being the least researched attempted of control in neuroscience, there is one behavioral phenomena that has been well examined: placebo effects. Placebo effects are the result of expecting or believing that something would work to alter a stimulus-response without the need for a bottom-up control mechanism (Guevarra et al., 2022). From a neurobiological standpoint, the administration of a placebo has been associated with heightened activity in various brain regions, including the ventral striatum OFC, dlPFC and vmPFC (Geuter et al., 2017). It is believed that activation in these brain areas supports the establishment of expectations linked to placebos as well as maintaining of contextual information. Furthermore, according to Braunstrein et al. (2017), placebo beliefs may also control other kinds of emotional reactions, such as disgust and the insula activity that occurs along with it.

This has been stated that implicit emotion regulation refers to affect modification techniques that are launched by implicit goals and carried out by more automated processes. Currently, there are two primary strategies for regulating implicit emotions. One of these is extinction learning (Braunstein et al., 2017). The situation in which acquired responses continue to occur following repeated exposure to a conditioned stimuli are referred to as extinction learning (Picó-Pérez et al., 2019). Extinction learning is implicit because it does not require conscious regulation of negative emotions (Silvers, 2020). The other implicit emotion regulation strategy is reinforcer revaluation. The phenomena known as "reinforcer revaluation" describes how a stimulus that formerly produced one result—a bigger reward, for example—now produces a new result—a smaller reward. The vmPFC and medial orbitofrontal cortex are implicated in processes related to extinction and reappraisal of reinforcers. The vmPFC serves as a central processing hub for the computation and revision of emotional significance, integrating data from diverse brain systems. The vmPFC integrates information regarding the current circumstances, objectives, motivational states, and past learning experiences to generate responses that are contextually suitable. The present approach offers an extensive overview of the expected emotional values associated with actions, stimuli, and outcomes (Braunstein et al., 2017).

These two implicit emotion regulation strategies are classified as implicit-automatic emotion regulation according to Braunstein et al. (2017). Braunstein et al. (2017) also define the implicit-controlled dimension in addition to these. Furthermore, they characterize the implicit-controlled dimension as a class of emotion regulation strategies involving controlled processes and an implicit emotion regulation goal. The psychological processes underlying implicit-controlled strategies consist of various combinations of goals and processes. The first type of regulation strategies involves incidental regulatory targets, where regulation is a byproduct of using metacontrol to perform another task. Examples of such strategies include those used in the emotional Stroop task and go-no go tasks. Studies that examined emotions in combination with various cognitive control tasks (such as emotional Stroop or go/stop task) and nested different tasks consistently showed brain activation in the dLPFC, IFG, ACC, and amygdala regions (Song et al., 2017). Studies have revealed alterations in rACC activation during the Emotional Stroop task. Increased activation of the rostral anterior cingulate cortex (rACC) when exposed to emotional distractors in this task is likewise linked to a decrease in dACC activity (Mohanty et al., 2007; Szekely et al., 2016; Zhu et al., 2018).

Strategies involving the application of externally generated and controlled processes belong under the second category of implicitly controlled strategies. Research on automatic goal pursuit and studies where a persistently active internal goal—like preserving correct emotional value representations—activates regulated mechanisms to update emotional responses are both significant in this context. Reversal learning is one case of this in action, when an organism follows up on the idea that one stimulus in a pair is first linked to a reward. However, this association is later reversed, requiring the organism to adjust its emotional values for both stimuli. Research on animal lesion suggests that reversal learning involves implicit regulation-like vmPFC-dependent value updating (Panayi & Killcross, 2018). Previous findings that vmPFC lesions impair reversal may result from damage to the transitional fibers connecting the amygdala and vlPFC. On the other hand automatic goal pursuit studies demonstrate that unconsciously activated external goals can guide subsequent behavior. There is limited literature on automatic goal pursuit tasks. However, research suggests that top-down control processes play a role in this task (Braunstein et al., 2017).

The Impact of tDCS on Emotion Regulation

The development of neurocognitive models of psychopathology as a result of extensive neuroimaging research has suggested possible targets for noninvasive neurostimulation methods like tDCS. In addition to their therapeutic applications, these techniques can serve as valuable tools in experimental research aimed at investigating the affective and cognitive consequences of manipulating activity in specific brain regions associated with emotion regulation (Clarke et al., 2020). Applying anodal and cathodal stimulation, which respectively up- and down-regulate cortical activity in the corresponding brain area, may be used to evaluate performance on cognitive tasks. Recent research on tDCS has explored how modifying cortical activity across various brain regions, including the PFC, influences attention, working memory, decision-making, inhibitory control, planning, and multitasking abilities (Nejati et al., 2018). Moreover, it has been utilized to ameliorate executive dysfunction in neuropsychiatric conditions typified by impaired executive functioning, including schizophrenia, addiction, anxiety-related disorders, depression, and attention deficit hyperactivity disorder (Molavi et al., 2020).

Although tDCS studies have focused on psychopathologies, these conditions were measured using tasks that also assessed emotion regulation strategies. Studies of this nature represent a considerable portion of the academic literature focused on exploring emotion regulation strategies through the application of tDCS. For example, in a research by Clarke et al. (2020), the effect of tDCS on attention bias to negative emotional content was assessed using an attentional probe task. The study found no effect of tDCS on

attentional bias variability, although it did demonstrate that it reduced emotional reactivity. Nejati, Majidinezhad, et al. (2022b) contended that deficiencies in emotion regulation capacity contribute to the onset of psychopathological conditions. They employed the Emotional Go/No-Go, Emotional Stroop, and Emotional 1-Back tasks to investigate how tDCS optimized women with major depression's the ability to regulate their emotions. The study found that tDCS stimulation increased working memory and interference control while having no effect on reaction time. The study found that when presented faces were happy, working memory performance increased and interference control decreased. The tDCS stimulation appeared to accelerate interference control in neutral and depressed faces, according to the emotional Stroop test. Furthermore, compared to the sham stimulation, accuracy was greater in the neutral and pleased face conditions of both actual stimulation groups.

The aim of this systematic review is to evaluate the influence of tDCS on various previously delineated emotion regulation strategies, aiming to enrich the current literature on the efficacy of tDCS. The methodology section encompasses a table presenting the articles assembled for this review.

Method

The literature review conducted for this study involved a comprehensive search for relevant literature, followed by a rigorous review of the identified sources, a conformity check, and the subsequent reporting of the findings. The abstract, method, and results sections of the studies identified in the literature review using the keywords "tDCS," "emotion regulation," "implicit emotion regulation," and "explicit emotion regulation" in the Google Scholar, PubMed, Scopus and Web of Science databases were examined in detail between 2018-2024. The rationale for selecting this specific year range is to analyze the findings of recent articles. This choice aims to better understand and evaluate current trends, innovations, and ongoing scholarly debates within the literature. Full-text articles were assessed for eligibility based on the inclusion and exclusion criteria.

The findings of this examination were then used to select 20 studies from Table 1 for inclusion in the study. Extracted data included: author(s), year of publication, sample characteristics, study design, type and duration of tDCS intervention, emotion regulation strategy assessed, tasks used, main findings, and conclusions. Any discrepancies in data extraction were resolved through discussion.

This literature review encompasses both descriptive and experimental studies. Inclusion criteria included articles written in English, the application of tDCS, and the measurement of implicit or explicit emotion regulation strategies using a standardized task. Thesis studies and research proposals were excluded from the review.

A narrative synthesis of the included studies was conducted. Studies were grouped according to the type of emotion regulation strategy (implicit vs. explicit), the specific brain regions targeted by tDCS, and the tasks used to measure emotion regulation. The effects of tDCS on emotion regulation were summarized and compared across studies.

Figure 1

PRISMA Flow Diagram of Main Search Strategy and Article Selection for this Review
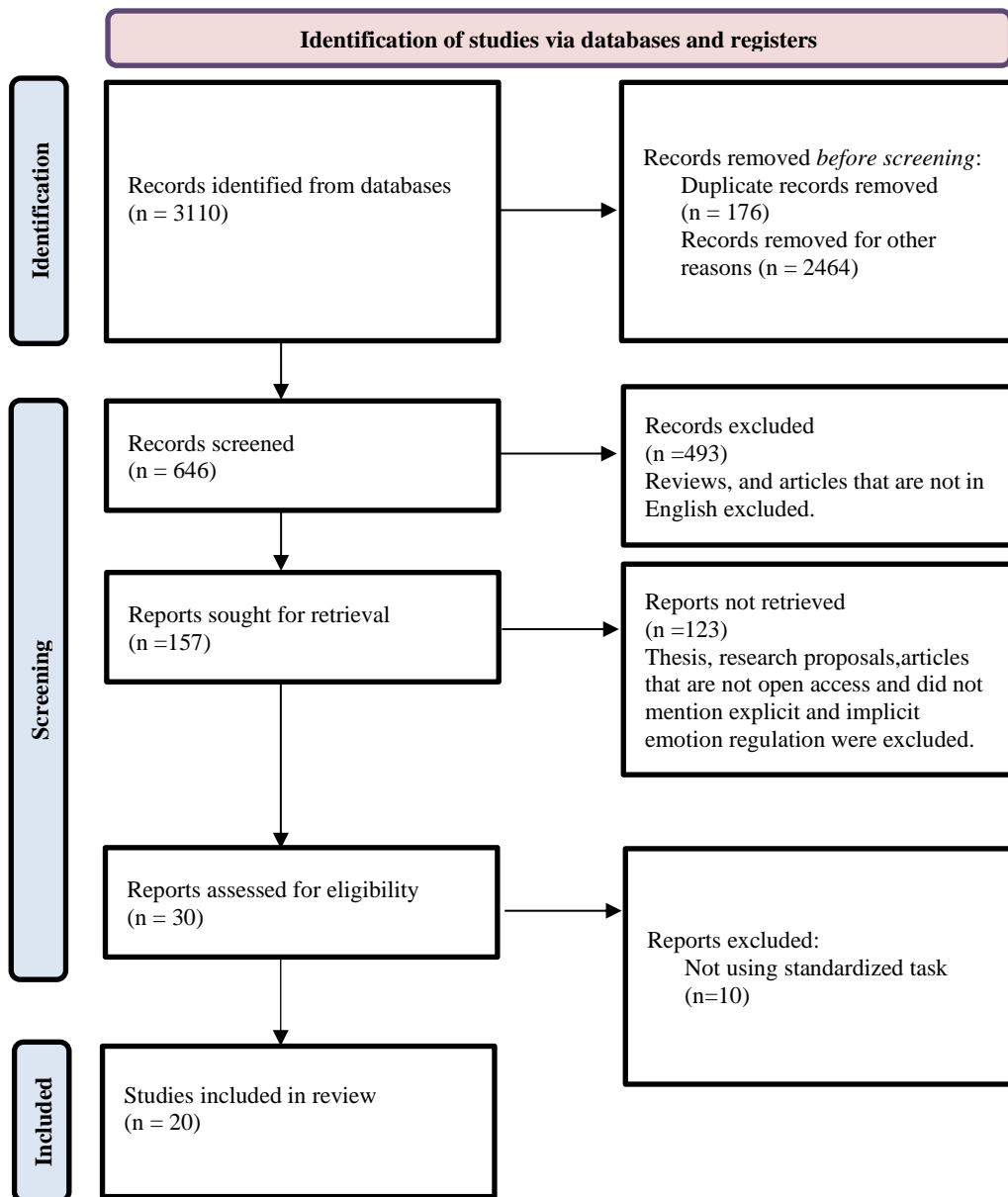
Table 1

Overview of the Studies Included in this Review

Author	ER goal and strategy	Task	tDCS application	Main findings
Chen et al. (2023)	Explicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal DLPFC	The enhanced cognitive control functioned as a mediator in the impact of HD-tDCS on the modulation of reinterpretation, although it did not influence detachment.
Albein-Urios et al. (2023)	Explicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal right VLPFC	Significant stimulation effects were observed in the 'Regulate' condition, revealing discrepancies in LPP amplitudes between anodal and sham stimulation.
De Smet et al. (2023)	Explicit/Cognitive reappraisal	Affective control task and Instructed reappraisal task	Cathodal and anodal right and left DLPFC	The findings showed that the emotional control task combined with active tDCS improved cognitive emotion regulation in participants.
Zhang et al. (2023)	Implicit/Implicit-controlled	Social exclusion pictures and priming words	Anodal rVLPFC and rDLPFC	Anode HD-tDCS stimulation of the rDLPFC and rVLPFC may considerably reduce the emotional reactions brought on by social isolation.
Smits et al. (2023)	Explicit/Cognitive reappsaisal	N-back task and Threat-of-Shock Paradigm	Anodal right DLPFC	This study did not identify any significant group-level distinctions between the sham and active tDCS training interventions.
Marotta et al. (2023)	Implicit/Implicit-controlled	Dot-probe task	Anodal right and left PFC	Right anodal-tDCS was found to eliminate the attentional bias (AB) toward angry faces and cause an AB toward sad faces in individuals with higher negative affect (NA) trait.
Nasiri et al. (2022)	Implicit and explicit/ Cognitive reappraisal and suppression	Go/Non-go task and N-back task	Cathodal DLPFC	Following treatment and at the 3-month follow-up, the group receiving UP combined with tDCS demonstrated notably greater enhancements in deficits related to emotion regulation, inhibition, and cognitive reappraisal.
Nejati, Majidinezhad, et al. (2022b)	Implicit/Implicit-controlled	Emotional go/no-go task and Emotional N-back task	Cathodal and anodal DLPFC and VMPFC	Anodal left dlPFC/cathodal right vmPFC stimulation improved interference control accuracy and speed.

Table 1 (Continued)

Author	ER goal and strategy	Task	tDCS application	Main findings
Doerig et al. (2021)	Explicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal DLPFC	During the reappraisal phase, the application of anodal tDCS was observed to be linked with a notable decrease in negative valence.
Clarke et al. (2020)	Explicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal left DLPFC	The evaluation of negative stimuli during emotion regulation was not affected by the use of tDCS.
Wu et al. (2020)	Explicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal right DLPFC	In instances of craving and negative emotions, tDCS to the right dlPFC led to downregulation of craving and upregulation of negative emotions.
Clarke, Sprlyan, et al. (2020)	Explicit/Selective attention	Mindfulness task	Anodal left DLPFC	Active tDCS administration significantly increased anxiety in response to worry induction.
Hansenne and Emilie (2020)	Explicit/Cognitive reappraisal	Cognitive reapprasial task	Anodal left DLPFC	The application of anodal tDCS to the left DLPFC can serve as a method for augmenting emotion regulation, whether in response to negative or positive emotional stimuli.
Yan et al. (2020)	Implicit/Implicit-controlled	Subliminal go priming and dot-probe task	Cathodal left OFC	Cathodal stimulation induced priming of implicit control targets, leading to a decrease in attentional avoidance of fear stimuli.
He et al. (2019)	Explicit/Cognitive rappraisal	Cognitive reappraisal task	Anodal RVLPFC	tDCS activation of the RVLPFC demonstrates a more substantial regulatory impact on social exclusion compared to individual negative emotions.
Ganho-Ávila et al. (2019)	Implicit/Fear extinction	Fear conditioning procedure	Cathodal rDLPFC	One to three months after the tDCS session and extinction, the cathodal tDCS group exhibited a moderate safety learning effect in action tendencies toward neutral stimuli.
Zhang et al. (2019)	Explicit/Cognitive reappraisal	Cognitive reappsaisal task	Anodal rVLPFC	Participants with mild depression showed decreased negative affect ratings when anodal tDCS was applied to the rVLPFC.
He et al. (2018)	Implicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal rVLPFC	During reappraisal, anodal tDCS to the rVLPFC reduced pupil diameter and negative emotion evaluations.
Marques et al. (2018)	Explicit/Cognitive reappraisal	Cognitive reappraisal task	Anodal DLPFC and anodal VLPFC	tDCS targeting the VLPFC led to a decrease in the negative valence of negative images and a reduction in the cardiac beat interval during an earlier stage of emotional processing.
Sánchez-López et al. (2018)	Implicit/Implicit-controlled	Attentional engagement-disengagement task	Anodal left DLPFC and right DLPFC	Active tDCS stimulation of the right DLPFC delayed gaze separation from emotional faces, whereas left DLPFC stimulation accelerated it.

Discussion

Table 1 presents a list of research articles that fit the inclusion criteria established through the literature review process. These 20 studies measured implicit or explicit emotion regulation strategies using the appropriate tasks. Upon initial examination, it becomes evident that explicit emotion regulation studies have been more extensively investigated than implicit emotion regulation studies (Albein-Urios et al., 2023; Chen et al., 2023; Clarke et al., 2020; Doerig et al., 2021; Hansenne and Emilie, 2023; He et al., 2018; He et al., 2019; Marques et al., 2018; Wu et al., 2020; Zhang et al., 2019)This difference could stem from the inherent complexity and difficulty involved in directly assessing implicit emotion regulation strategies through tasks. On the other hand, the lack of a distinct demarcation between implicit and explicit emotion regulation strategies could have influenced the observed distinctions. Implicit emotion regulation involves automatic and unconscious processes that modulate emotional responses, whereas explicit emotion regulation entails deliberate and conscious efforts to regulate emotions (Qiu et al., 2023). The challenge in studying implicit emotion regulation lies in the development of tasks that can accurately capture these processes. Numerous traditional emotion regulation tasks predominantly evaluate explicit strategies like cognitive reappraisal or expressive suppression, which are more straightforward to gauge through self-report or observable behavioral responses. However, recent advancements in experimental paradigms, such as implicit association tasks and physiological measures, offer promising avenues for directly investigating implicit emotion regulation (Etkin et al., 2020).

Upon reviewing numerous studies on this topic, it becomes evident that tDCS administration enhances both implicit and explicit emotion regulation performance (Albein-Urios et al., 2023; Chen et al., 2023; Clarke, Sprlyan, et al., 2020; De Smet et al., 2023; Doerig et al., 2021; Ganho-Ávila et al., 2019; Hansenne and Emilie, 2023; He et al., 2018; He et al., 2019; Marques et al., 2018; Marotta et al., 2023; Nasiri et al., 2022; Nejati, Majidinezhad, et al., 2022b; Sánchez-López et al., 2018; Wu et al., 2020; Yan et al., 2020; Zhang et al., 2019; Zhang et al., 2023). However, studies by Smits et al. (2023) and Clarke et al. (2020) did not detect a significant influence of tDCS on emotion regulation, despite the majority of research suggesting otherwise. This disparity in the literature suggests that research on tDCS have not clearly shown whether tDCS has an impact. The overarching conclusion derived from this is the necessity for an expansion of studies evaluating the effects of tDCS on emotion regulation, employing diverse combinations of variables.

 Regional specificity emerged as a key theme across the reviewed studies, with various regions of the PFC targeted in tDCS interventions. Anodal stimulation of the DLPFC, for instance, consistently yielded enhancements in explicit cognitive reappraisal abilities (Chen et al., 2023; Hansenne & Emilie, 2023), whereas stimulation of the VLPFC showed promise in modulating emotional valence (Marques et al., 2018). However, methodological variability in stimulation parameters and task designs complicates the interpretation of findings and underscores the need for standardization in future research.

Moreover, individual differences in baseline cognitive and emotional functioning as well as trait characteristics may moderate tDCS effects of tDCS on emotion regulation. For example, individuals with heightened levels of negative affect or depression may exhibit differing levels of responsiveness to tDCS interventions targeting emotion regulation enhancement (He et al., 2018; Zhang et al., 2019). Understanding these individual differences is crucial for tailoring tDCS interventions to specific populations and optimizing the treatment outcomes.

In summary, the majority of evidence indicates that tDCS improves emotion regulation; yet, inconsistent results emphasize the need for more study to clarify the exact processes behind these improvements. To optimize the therapeutic efficacy of transcranial magnetic stimulation (tDCS) for

enhancing adaptive emotion regulation and psychological well-being, forthcoming research should focus on elucidating the impact of location-based specificity, individual differences, and methodological factors on tDCS outcomes.

It is an undeniable reality that stressful life events and conflicts are inevitable incidents that can induce changes in an individual's mood. While minor mood fluctuations are inherent to life, enduring and substantial mood disruptions can elevate stress levels and profoundly affect an individual's quality of life (Çınaroğlu, 2024). Thus, through elucidating the effects of tDCS on emotion regulation in both clinical and non-clinical populations, along with understanding the underlying mechanisms, we can optimize its therapeutic potential to improve cognitive and emotional well-being. In conclusion, this systematic review emphasizes the requirement for additional studies exploring the effects of tDCS on emotion regulation across explicit and implicit dimensions. Future research requires to examine individual variations in response to tDCS treatments and clarifies the underlying brain processes of tDCS-induced modifications in emotion regulation.

Consequently, tDCS represents a potentially powerful tool for investigating and modulating cognitive function and emotion regulation processes. By integrating insights from neuroscience and psychology, tDCS research offers valuable insights into the complex interplay between brain function and emotional regulation. This paves the way for innovative interventions designed to improve mental health and overall well-being.

Compliance with Ethical Standards

Ethical Approval

Ethical committee approval for this study is not applicable.

Author Contributions

All authors participated equally in all aspects of the preparation of the review article, with each contributing 50% of the total effort.

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Survivor TV Shows and the Risk of Muscle Dysmorphia

Survivor TV Şovları ve Kas Dismorfisi Riski

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Abstract

This review paper investigates the correlation between the portrayal of physical fitness and strength in 'Survivor' television programs and the risk of developing muscle dysmorphia—a body image disorder characterized by an obsessive concern with perceived insufficient muscularity. The article examines how these programs, which frequently highlight participants with highly developed and physically strong bodies, may influence viewers' perceptions of an ideal physique. This influence could lead to increased dissatisfaction with one's own body and contribute to the onset or exacerbation of muscle dysmorphia. Through an analysis of various case studies, research findings, and surveys, this review explores the broader impact of media on individual body image perceptions. Additionally, it evaluates strategies to mitigate the negative effects of these shows on viewers, such as promoting media literacy, offering psychological support, and implementing public health initiatives. The findings underscore the importance of understanding the media's role in shaping mental well-being, particularly in relation to body image disorders like muscle dysmorphia. This review aims to shed light on the relationship between 'Survivor' TV shows and muscle dysmorphia, emphasizing the need for critical media analysis and the promotion of positive body image.

Keywords: Muscle Dysmorphia, Media Influence, Body Image, Reality Television.

Öz

Bu derleme makalesi, 'Survivor' televizyon programlarında fiziksel form ve gücün tasviri ile kas dismorfisi—yetersiz kaslılık algısı ile ilgili takıntılı bir vücut imajı bozukluğu—gelişme riski arasındaki ilişkiyi incelemektedir. Makale, genellikle son derece kaslı ve güçlü bedenlere sahip yarışmacıları öne çıkaran bu programların, izleyicilerin ideal fiziksel görünüm algılarını nasıl etkileyebileceğini ele almaktadır. Bu etki, kişinin kendi bedeninden duyduğu memnuniyetsizliği artırarak kas dismorfisinin ortaya çıkmasına veya şiddetlenmesine katkıda bulunabilir. Çeşitli vaka çalışmaları, araştırma bulguları ve anketlerin analizi yoluyla bu derleme, medyanın bireysel vücut imajı algıları üzerindeki daha geniş etkilerini keşfetmektedir. Ayrıca, bu programların izleyiciler üzerindeki olumsuz etkilerini hafifletmek için medya okuryazarlığını teşvik etmek, psikolojik destek sağlamak ve kamu sağlığı girişimleri uygulamak gibi stratejileri değerlendirmektedir. Bulgular, özellikle vücut imajı bozuklukları gibi zihinsel sağlığa yönelik medyanın rolünü anlamanın önemini vurgulamaktadır. Bu derleme, 'Survivor' TV programları ile kas dismorfisi arasındaki ilişkiye ışık tutmayı hedeflemekte ve eleştirel medya analizinin ve olumlu vücut imajının teşvik edilmesinin gerekliliğini vurgulamaktadır.

Anahtar Kelimeler: Kas Dismorfisi, Medya Etkisi, Vücut İmajı, Televizyon Programları.

Survivor TV Shows and the Risk of Muscle Dysmorphia

The pervasive influence of media on mental health, body image, and cultural standards has become a focal point of concern in contemporary society (Huang et al., 2021). Among the various media formats, reality television has emerged as a particularly powerful force in shaping viewers' perceptions. This review specifically examines the relationship between the popularity of 'Survivor' television programs and the increased vulnerability to muscle dysmorphia—a body image disorder characterized by an obsessive focus on perceived muscular inadequacy. 'Survivor' TV series, which have captivated audiences worldwide, often showcase participants engaged in grueling challenges that emphasize physical strength, endurance, and resilience. These portrayals can significantly shape viewers' ideals of physical fitness and body image, potentially contributing to the development or exacerbation of muscle dysmorphia (Egbert & Belcher, 2012).

Muscle dysmorphia is a psychiatric disorder characterized by an obsessive concern that one's body is not sufficiently muscular or lean, despite often possessing a well-developed and muscular physique (Kanayama & Pope, 2011). This condition has become increasingly prevalent in response to cultural trends that glorify extreme muscularity and fitness (Mueller et al., 2024). Individuals suffering from muscle dysmorphia frequently perceive their bodies as lacking muscle mass, leading to a distorted body image. To achieve their perceived ideal physique, these individuals often engage in behaviors such as intense and sometimes excessive exercise routines, strict dietary practices, and, in some cases, the use of performance-enhancing substances. The impact of muscle dysmorphia extends beyond physical symptoms, frequently causing significant psychological distress and impairing social and professional functioning (Cunningham et al., 2017).

The widespread popularity of 'Survivor' television programs, which often highlight participants who are physically strong and muscular, raises important questions about their potential impact on viewers' body image and the exacerbation of issues related to muscle dysmorphia (Mullick & Grieve, 2023). These shows, by blending entertainment with elements of realism, create narratives that glorify exceptional physical abilities and idealized muscular physiques, potentially setting unrealistic and harmful standards for their audience (Richardson, 2016). This review aims to explore the complex relationship between the portrayal of physical fitness in 'Survivor' TV episodes and the onset or worsening of muscle dysmorphia symptoms in viewers. Through an analysis of existing research, this study seeks to deepen our understanding of how media portrayals influence mental health and body image issues, while also identifying gaps in the current knowledge.

The objectives of this review are multifaceted. First and foremost, it seeks to provide a comprehensive examination of muscle dysmorphia, including its definition, symptoms, and the underlying psychological mechanisms that contribute to its development. In addition, the review aims to analyze how 'Survivor' television programs portray physical fitness and body image, and to assess the potential influence these depictions have on viewers' attitudes and behaviors. Beyond this, the review will consider the broader implications of these findings for clinical practice, media production, and public health strategies. Finally, it will offer recommendations for future research and interventions designed to mitigate the negative effects of media on body image and mental health.

Muscle Dysmorphia: Definition, Symptoms, and Relevance

Muscle dysmorphia, often referred to as "bigorexia" or "reverse anorexia," is a complex psychiatric disorder that falls under the broader category of body dysmorphic disorder (Cooper et al., 2020). This condition is characterized by a persistent and intrusive belief that one's body lacks adequate muscle mass, despite evidence to the contrary. Individuals with muscle dysmorphia typically have a distorted perception of their own physique, believing they are less muscular than they actually are. This

misconception persists even in the face of contradictory information and often leads to significant psychological distress, as well as a notable decline in social and occupational functioning (Grieve, 2007; Çınaroğlu, 2023).

Muscle dysmorphia manifests through a variety of symptoms, all of which are closely tied to an individual's self-esteem and body perception. The primary symptoms include an exaggerated and often uncontrollable preoccupation with muscle size and definition, driving affected individuals to engage in various behaviors aimed at enhancing their physique. This obsession is most evident in the form of frequent and prolonged workout sessions, particularly those centered around weightlifting and bodybuilding. Individuals with muscle dysmorphia may spend several hours each day exercising, often pushing themselves to the point of injury or severe fatigue (Almeida et al., 2019). In addition to intense training regimens, this disorder is commonly associated with strict and rigid dietary practices designed to increase muscle mass or reduce body fat (Contesini et al., 2013). In more severe cases, individuals may resort to the misuse of anabolic steroids or other performance-enhancing substances, which carry significant health risks (Rohman, 2009).

Individuals with muscle dysmorphia often experience significant discomfort in social settings, particularly those where their bodies might be visible or closely scrutinized. As a result, some may avoid situations like swimming pools or gyms and choose to wear loose-fitting clothing to conceal their physical appearance (Olivardia, 2009). This tendency to withdraw from social interactions, coupled with heightened self-consciousness, can lead to isolation and hinder the development of relationships, further exacerbating the psychological burden of the disorder.

The relevance of muscle dysmorphia in contemporary culture is profound, especially in light of prevailing cultural standards regarding physical fitness and attractiveness. Society's emphasis on a lean and muscular physique as symbols of health, success, and beauty has intensified the focus on body image across both genders (Readdy et al., 2013). These cultural expectations, amplified by the widespread availability and consumption of media that often glorifies a specific body type, have created an environment that fosters body image anxieties (Pidgeon & Harker, 2013) and contributes to the rise of conditions such as muscle dysmorphia.

Understanding the relationship between 'Survivor' TV shows and muscle dysmorphia requires a deep comprehension of the nature of this condition and its relevance within the context of contemporary societal standards and media influence. This review aims to examine how these TV series might contribute to the development or exacerbation of muscle dysmorphia, with a broader focus on exploring the implications of media portrayals of physical fitness and body image on mental health.

Overview of 'Survivor' TV Shows and Their Popularity

The 'Survivor' TV series, a hallmark of reality television, have achieved immense popularity and evolved into a cultural phenomenon since their inception. These programs place participants in remote and challenging environments where they must navigate a series of activities and challenges designed to test their physical strength, endurance, strategic thinking, and ability to withstand harsh conditions. The format typically involves isolating a group of participants from the outside world, providing them with limited resources, and having them compete for a substantial reward through a mix of physical trials, social strategy, and elimination rounds (Britannica, 2024).

Physical challenges are a central feature of 'Survivor,' often highlighting tasks that require significant physical exertion, such as obstacle courses, endurance tests, and strength competitions. These challenges serve a dual purpose: they evaluate the participants' physical abilities while also boosting the show's entertainment value and dramatic appeal. Contestants, selected for their physical strength and attractiveness, are often portrayed as epitomes of physical fitness and athleticism. This portrayal

reinforces a specific ideal of physical fitness and appeal, showcasing strong, lean, and physically capable individuals as role models.

The success of the 'Survivor' TV series can be attributed to several factors. Firstly, the unique blend of physical competition, social dynamics, and the challenge of survival in extreme conditions draws a wide and diverse audience. The show's unpredictable and dramatic nature, combined with the personal stories and strategies of the contestants, creates a compelling narrative that captivates viewers. Additionally, the emphasis on physical strength and the visual appeal of the participants align with societal standards of beauty and fitness, further enhancing the program's attractiveness.

The widespread popularity of 'Survivor' has significantly shaped societal perceptions of physical fitness and the ideal physique (Egbert & Belcher, 2012). The frequent portrayal of well-toned, athletic bodies in these shows plays a role in reinforcing societal norms and expectations regarding physical appearance. For many viewers, the contestants become benchmarks of physical fitness, potentially influencing their own body image and behaviors.

In the context of muscle dysmorphia, the emphasis on physical power and muscularity in 'Survivor' episodes is particularly relevant. This research focuses on how these portrayals may impact viewers' perceptions and increase the risk of developing muscle dysmorphia. It is essential to explore how the depiction of physical ideals in popular media like 'Survivor' can shape both individual and societal attitudes toward body image.

Rationale for Linking 'Survivor' TV Shows with Muscle Dysmorphia

The rationale for exploring the correlation between 'Survivor' television programs and the susceptibility to muscle dysmorphia lies in the unique and powerful way these shows portray physical fitness and body image. Participants in these programs are often selected for their athletic and muscular physiques, and their physical abilities are prominently featured. This portrayal can have a profound impact on viewers, particularly those who may already be prone to concerns about their physical appearance.

In a society that places a high value on physical appearance, the repeated depiction of highly athletic and strong individuals as successful and admirable can contribute to the creation of unrealistic body image ideals (Cereda, 2023). These portrayals can reinforce the belief—especially among those already struggling with body image issues—that a lean and muscular physique is not only desirable but essential for acceptance and success. This belief can have a particularly strong effect on young adults and teenagers, who are still developing their sense of identity and are more susceptible to the influence of media.

The impact of these shows can be particularly profound for individuals who are at risk of or currently experiencing muscle dysmorphia (Grieve, 2007). Watching participants who exemplify the 'ideal' muscular physique can intensify these individuals' preoccupation with muscle size and definition, reinforcing the mistaken belief that they lack sufficient muscle mass, even when evidence suggests otherwise. This distorted perception can lead to an escalation of behaviors associated with muscle dysmorphia, such as excessive exercise, rigid dietary regimens, and potentially the use of performance-enhancing substances.

Moreover, the competitive and survival-oriented nature of the 'Survivor' television series can further influence perceptions of physical fitness. These programs often glorify not only physical attractiveness but also strength and endurance as essential qualities for success and survival. This emphasis may reinforce the idea that muscularity is not just about aesthetics but also a key indicator of physical prowess and resilience, thereby exacerbating the psychological challenges faced by those with muscle dysmorphia.

Objectives of the Review

This review paper seeks to deepen the understanding of how 'Survivor' TV episodes may influence the risk of developing muscle dysmorphia. By thoroughly examining this issue, the review aims to provide valuable insights across the fields of psychology, media studies, and public health. The objectives of this review are as follows:

Examine the Relationship Between 'Survivor' TV Shows and Muscle Dysmorphia: This review aims to evaluate the potential impact of the widespread popularity of 'Survivor' TV series, which prominently feature physically fit and muscular participants, on the development or worsening of muscle dysmorphia. This includes investigating the psychological mechanisms through which media portrayals may shape perceptions and behaviors related to body image, particularly concerning ideals of muscularity and physical fitness.

Analyze Existing Literature: A comprehensive analysis of existing literature and research studies has been conducted to gather data and perspectives on the relationship between media depictions of physical fitness—specifically in 'Survivor' television programs—and the susceptibility to muscle dysmorphia. This involves reviewing research on the impact of media on body image issues and exploring the unique characteristics of muscle dysmorphia.

Discuss Psychological and Societal Implications: This review examines the broader psychological and cultural impacts of the interaction between media portrayals in 'Survivor' TV shows and body image. It focuses on understanding how these media depictions influence personal self-esteem, body satisfaction, and overall mental well-being. Additionally, the review explores societal consequences, such as the reinforcement of certain physical standards and the potential effects on public attitudes toward health and fitness.

Identify Gaps and Suggest Areas for Further Research: A key objective of this study is to identify gaps in the current understanding and research on this topic. This includes recognizing areas that require further exploration, such as the long-term effects of regular viewership of these programs, the role of demographic factors like age and gender in susceptibility to muscle dysmorphia, and the effectiveness of interventions designed to mitigate the influence of media on body image disorders.

Provide Recommendations for Future Research and Interventions: Based on the findings and analysis, this review offers recommendations for future research directions. These may include suggestions for methodological approaches, specific populations to study, and potential interventions aimed at reducing the negative impact of media portrayals of physical fitness on body image and related disorders such as muscle dysmorphia.

Overall, this review aims to provide a comprehensive and nuanced analysis of the potential impact of 'Survivor' TV series on the risk of muscle dysmorphia. It seeks to offer valuable insights for researchers, healthcare professionals, media producers, and policymakers.

Muscle Dysmorphia: An Overview

Detailed Description of Muscle Dysmorphia

Muscle dysmorphia is a subtype of body dysmorphic disorder, a group of mental health conditions characterized by an intense fixation on perceived physical flaws. Specifically, muscle dysmorphia involves a dominant preoccupation with the belief that one's body lacks sufficient muscularity or leanness. Even when individuals possess a well-developed physique, this distorted perception persists, leading to significant psychological distress and changes in behavior (dos Santos et al., 2016).

Individuals with muscle dysmorphia experience a continuous internal struggle with their self-image,

unable to perceive their bodies accurately. This skewed perception, where they often believe they have insufficient muscle mass despite possibly having more than average, is a hallmark of the disorder. This misconception is highly resistant to reassurance from others and persists even when confronted with objective measurements or external feedback that contradicts their belief (Grunewald & Blashill, 2021).

The behavioral symptoms of muscle dysmorphia are complex and typically involve efforts to increase muscle mass and reduce body fat. Common behaviors include excessive weightlifting and engagement in rigorous and often intense workout routines that go beyond standard fitness practices. This obsessive focus on physical exercise can lead to overtraining and a neglect of other vital life responsibilities, such as work, education, or social relationships (Olave et al., 2021).

Individuals with muscle dysmorphia often adhere strictly to rigid dietary regimes, typically following inflexible eating plans aimed at enhancing muscle growth or reducing body fat. These diets may lack balance and nutritional adequacy, potentially leading to health problems. In more severe cases, individuals may turn to anabolic steroids or other performance-enhancing substances in their quest for a more muscular physique. While these substances might temporarily boost muscle growth, they pose significant health risks, including hormone imbalances, liver damage, and an increased risk of cardiovascular issues (Strobel et al., 2020).

Muscle dysmorphia can profoundly affect an individual's life, often leading to considerable psychological distress that impacts self-esteem, mood, and overall mental well-being. The relentless pursuit of an unattainable physical ideal can become all-consuming, resulting in social isolation, strained relationships, and a reduced quality of life (Mitchell et al., 2017).

To fully understand the potential impact of media portrayals, such as those in 'Survivor' TV series, on individuals vulnerable to muscle dysmorphia, it is essential to comprehend the complex nature of this condition, including its psychological underpinnings and associated behaviors.

Epidemiology and Demographics

The study of the prevalence and distribution of muscle dysmorphia provides valuable insights into the demographic patterns and occurrence of this condition (Mitchison et al., 2022). Due to its underrecognition and lack of diagnosis, muscle dysmorphia is often overlooked, making it challenging to accurately determine its prevalence. However, research indicates that the condition is more common than previously thought, particularly within certain communities and environments.

Muscle dysmorphia affects individuals across various demographics, but it is predominantly observed in men. The societal emphasis on muscularity and strength as markers of masculinity may contribute to this gender disparity. Men, especially those in environments where physical attractiveness is highly valued, are more susceptible to developing the disorder. This includes individuals involved in bodybuilding, modeling, and certain sports, where a well-developed physique is often considered essential for success and social validation (Bégin et al., 2019).

The disorder is also prevalent among fitness enthusiasts and frequent gym-goers, where the culture often idolizes extreme muscularity and low body fat. In these environments, prolonged exposure to idealized body standards can exacerbate concerns about body image, leading to an increased vulnerability to muscle dysmorphia.

Age is a significant factor in the epidemiology of muscle dysmorphia (Mueller et al., 2024). The disorder often begins to manifest during late adolescence or early adulthood, a developmental period characterized by heightened self-consciousness and concern with physical appearance. Adolescents, who are in the process of forming their identities and are more susceptible to cultural and peer pressures, may be particularly vulnerable to developing muscle dysmorphia. The desire to conform to perceived

standards of physical attractiveness and strength during this stage can trigger or exacerbate the symptoms of the condition.

While muscle dysmorphia predominantly affects males, it is important to recognize that it can occur in individuals of any gender. Women can also experience muscle dysmorphia, although its expression and the factors contributing to susceptibility may differ due to unique socioeconomic and cultural influences (Readdy et al., 2011).

Psychological and Physical Health Consequences

Muscle dysmorphia, although largely a disease related to body image, has wide-ranging implications that go beyond an individual's impression of their physical appearance. The illness has a deep and diverse influence on both psychological and physical health.

Psychological Consequences

Muscle dysmorphia has a profound and complex psychological impact, significantly affecting the mental health and overall well-being of those who suffer from this disorder. One of the key psychological outcomes is the development of intense anxiety, particularly related to body image and physical appearance. This anxiety is not just a fleeting concern but a pervasive and debilitating condition that infiltrates every aspect of an individual's life. The constant worry and fixation on muscle size and definition can disrupt daily routines, impair cognitive function, and hinder social interactions. The fear of being perceived as insufficient or lacking in muscularity often leads to avoidance behaviors, which further exacerbate social isolation and psychological distress (Cerea et al., 2018).

Depression is another common psychological consequence of muscle dysmorphia. The relentless pursuit of an idealized and often unattainable physical appearance fosters a cycle of disappointment and dissatisfaction. Individuals with this disorder may experience feelings of hopelessness, sadness, and a profound sense of low self-esteem, stemming from their inability to achieve the desired level of muscularity. The gap between their perceived body image and their idealized appearance can lead to a deep sense of inadequacy, significantly impacting their mood and overall outlook on life (Mitchell et al., 2017).

Low self-esteem is closely linked to the psychological effects of muscle dysmorphia. This disorder, which centers on perceived physical inadequacies, can severely undermine an individual's confidence and self-perception. Those affected often engage in negative self-assessment, viewing themselves as deficient when compared to the muscular ideals they strive to achieve. This negative self-perception can spill over into other areas of life, leading to a pervasive sense of incompetence and a diminished belief in one's abilities (Phillips et al., 2004).

At the heart of muscle dysmorphia is a distorted body image, which is the core psychological impact of the condition. The persistent dissatisfaction with one's physique, even in the face of contrary evidence, results in a skewed perception of physical appearance. This distortion goes beyond mere dissatisfaction with specific body parts; it manifests as an all-encompassing and compulsive preoccupation that dominates the individual's thoughts and behaviors. The ongoing negative self-talk, obsession with achieving a more muscular physique, and inaccurate self-perception contribute to a cycle of psychological distress, further entrenching the disorder in the individual's life.

Understanding these psychological ramifications is crucial for comprehending the full impact of muscle dysmorphia. It underscores the need for effective treatments and support for those suffering from this condition and highlights the importance of examining external factors, such as media portrayals of physical fitness, that may contribute to or exacerbate these mental health challenges.

Physical Health Consequences

Muscle dysmorphia not only has psychological consequences but also significantly impacts physical well-being. A major concern is the potential for harm resulting from excessive exercise (Mosley, 2008). Individuals with muscle dysmorphia often engage in rigorous and prolonged workout regimens, driven by their desire to achieve and maintain a highly muscular physique. This excessive exercise can push the body beyond safe limits, often ignoring signs of pain and fatigue. The result can be a range of injuries, from muscle strains and joint damage to more severe conditions such as stress fractures or chronic overuse injuries. These injuries not only cause physical pain and discomfort but also exacerbate the psychological distress associated with the disorder, as they may temporarily hinder the ability to exercise, further fueling body image concerns.

Another significant physical health risk associated with muscle dysmorphia is the misuse of anabolic steroids or other performance-enhancing drugs. Some individuals turn to these substances in their quest for greater muscle growth and definition, hoping to expedite and optimize the achievement of their ideal physique. However, the use of these drugs can lead to serious and long-lasting health consequences. Hormonal imbalances (Davies et al., 2011) are a common side effect, resulting in issues such as reduced fertility (Whitaker et al., 2021), changes in sexual desire (Amodeo et al., 2022), and mental health problems (Wolke & Sapouna, 2008). The misuse of steroids can also cause liver damage, increase the risk of cardiovascular diseases, and potentially raise the likelihood of developing certain types of cancer. These health risks are particularly concerning because the use of these drugs is often hidden due to legal and social stigma. This concealment can delay the seeking of medical help and advice, further compounding the risks.

Individuals with muscle dysmorphia often face nutritional deficiencies due to the disorder's emphasis on strict dietary control. These regimens typically focus on foods believed to enhance muscle growth and reduce body fat. However, such diets can sometimes be unbalanced and lacking in essential nutrients, leading to deficiencies that may affect overall health. Inadequate intake of vitamins, minerals, and other critical nutrients can result in various health problems (Rickard, 2014), including a weakened immune system, reduced bone density, and impaired organ function. In severe cases, these nutritional deficits can have long-lasting and potentially irreversible effects on health.

The physical consequences of muscle dysmorphia highlight the disorder's capacity to impact the body in numerous, often severe ways. Understanding these effects is essential for fully recognizing the disorder's impact and for providing comprehensive treatment and support to those affected by muscle dysmorphia.

Potential for Comorbid Conditions

Muscle dysmorphia, while a significant mental health concern in its own right, often coexists with other psychological conditions (Cafri et al., 2008). It is commonly associated with a range of mental health issues, creating a complex web of psychological challenges for those affected (Pope et al., 2005). Anxiety disorders frequently accompany muscle dysmorphia (Chandler et al., 2009). The chronic preoccupation with physical appearance and the intense desire to achieve a particular body shape can exacerbate or trigger symptoms of generalized anxiety, social anxiety, and panic disorders. This constant state of worry and tension related to body image can profoundly impact an individual's overall mental well-being and quality of life.

Depressive disorders also often co-occur with muscle dysmorphia (Grieve & Shacklette, 2012). The ongoing dissatisfaction with one's physical appearance, the relentless pursuit of an unattainable ideal, and the resulting social and professional limitations can lead to feelings of hopelessness, sadness, and a pervasive sense of low self-esteem. This may manifest as major depressive disorder or dysthymia,

further complicating the individual's mental health landscape.

Additionally, muscle dysmorphia is closely linked to obsessive-compulsive disorder (OCD). The rigid and repetitive behaviors characteristic of muscle dysmorphia—such as excessive exercise, strict dietary control, and frequent body checking—bear similarities to the compulsions seen in OCD. The obsessive nature of thoughts about physical inadequacy in muscle dysmorphia may also mirror the intrusive and persistent thoughts experienced in OCD (Frare et al., 2004).

Individuals with muscle dysmorphia often face significant concerns related to substance addiction, particularly the use of steroids and other performance-enhancing drugs (Scarth et al., 2023). The use of these substances is typically driven by the desire to achieve rapid and substantial increases in muscle mass. However, this can lead to dependence and addiction, further deteriorating both the emotional and physical well-being of the individual. The combination of health risks associated with substance abuse and the psychological challenges posed by muscle dysmorphia creates a complex and potentially dangerous situation, necessitating comprehensive and multi-faceted treatment strategies.

To fully understand the scope of the issue, it is essential to recognize the potential for co-occurring disorders in individuals with muscle dysmorphia. This highlights the need for a holistic therapeutic approach that addresses not only the symptoms of muscle dysmorphia but also any concurrent mental health conditions. Additionally, it underscores the importance of considering external factors, such as media influences like 'Survivor' television programs, which may contribute to or exacerbate these complex health issues. Media portrayals of physical ideals can significantly shape how individuals perceive their own body image, potentially triggering or worsening symptoms of muscle dysmorphia and related disorders.

Survivor' TV Shows and Physical Idealization

Description of 'Survivor' TV Shows

The 'Survivor' TV series, including popular Turkish versions like 'Survivor All Star,' epitomizes a distinct and widely embraced genre of reality television. These shows combine survival challenges, physical competition, and strategic maneuvering to create a unique entertainment experience (Champion, 2016). In 'Survivor All Star,' as in other versions, participants are sent to remote locations where they must endure demanding living conditions with limited resources. This particular version, which enjoys significant popularity in Turkey, features former contestants—often fan favorites—who have demonstrated exceptional skills in previous seasons.

The physical aspect of 'Survivor' shows, including 'Survivor All Star,' plays a crucial role. Contestants face physically demanding tasks designed to test their stamina, strength, mental resilience, and strategic thinking. These challenges vary, from endurance competitions like long-distance swimming to strength-based tasks such as lifting or carrying heavy objects. Success in these tasks is often essential for contestants' survival in the game, making physical fitness and strength critical to their performance.

Physical prowess is not only necessary for the survival tasks in these shows but also a key element of their appeal and entertainment value. 'Survivor All Star' in Turkey, for instance, highlights contestants' athletic abilities and endurance, adding excitement and drama to the viewing experience. This emphasis on physicality can influence viewers' perceptions of ideal body types and physical capabilities, often showcasing contestants with muscular and toned physiques (Ayten, 2017).

The consistent portrayal of fit and athletic contestants in 'Survivor All Star' and other 'Survivor' series reinforces specific physical ideals. This portrayal can impact viewers' body image perceptions, setting potentially unrealistic standards of fitness and muscularity. In essence, 'Survivor' TV programs, including international versions like Turkey's 'Survivor All Star,' serve not only as entertainment but

also as platforms that celebrate physical fitness and strength, influencing viewers' attitudes towards physical fitness and body image (Şimşek, 2018).

Analysis of the Representation of Body Image and Physical Ideals

The depiction of body image and physical standards in 'Survivor' TV episodes is a key aspect of their cultural impact. These programs often feature participants who not only excel in survival and strategic games but also possess athletic and physically strong physiques. The selection process for these shows typically favors individuals with a specific physical aesthetic, often prioritizing those who display muscularity, tone, and athletic prowess. This selection bias results in a portrayal of ideal body types that aligns with cultural standards of fitness and attractiveness, highlighting a narrow range of physical forms on the program (Elitaş & Keskin, 2019).

The emphasis on physical fitness and attractiveness among participants significantly contributes to the establishment and reinforcement of certain physical standards for viewers. As viewers repeatedly see these physically strong and muscular individuals competing and succeeding, a narrative emerges that elevates the attractiveness and value of these body types. This portrayal can subtly influence how viewers perceive physical attractiveness and what they consider to be the 'perfect' physique. Regular exposure to these idealized bodies on television may lead viewers to internalize these ideals, potentially altering their own perceptions and desires regarding body image.

The impact of consistently viewing idealized bodies on television extends beyond mere admiration or appreciation. These images can significantly influence certain viewers, particularly those who are already concerned about their physical appearance or vulnerable to body image issues. The portrayal of physical fitness and muscularity as symbols of success, attractiveness, and power may drive these viewers to pursue similar physical ideals, often setting unrealistic and unattainable goals for themselves. This can lead to increased dissatisfaction with their own bodies, an intensified obsession with achieving a specific physique, and, in some cases, the adoption of harmful behaviors aimed at altering their bodies to meet these ideals (Agliata & Tantleff-Dunn, 2004).

Moreover, the depiction of physical ideals in 'Survivor' television series can contribute to broader societal discussions about body image. These portrayals may reinforce the cultural emphasis on physical attractiveness, particularly the value placed on having well-defined muscles and a slim physique. This can have far-reaching consequences, affecting not only individual viewers but also shaping cultural standards and expectations related to physical health and body perception.

Upon closer examination, it becomes clear that the depiction of body image and physical ideals in 'Survivor' TV series goes beyond casting choices or entertainment value. These portrayals reflect and strongly influence cultural conceptions of physical attractiveness and what is considered achievable, potentially having a significant impact on viewers' body image and self-esteem.

Discussion of Cultural and Societal Impacts

The portrayal of physical perfection in 'Survivor' television series carries significant cultural and sociological implications that extend far beyond entertainment. By featuring participants who are physically fit, strong, and attractive, these programs contribute to the reinforcement and potential shaping of societal standards and expectations for physical attractiveness, fitness, and strength. The depiction of certain body types as ideal and desirable not only reflects existing societal norms but also has the power to strengthen them. This reinforcement can create a cultural environment where physical fitness and a specific body type are overly emphasized, thereby influencing public perceptions and attitudes toward body image.

The impact of 'Survivor' television programs on viewers' body image and self-esteem is a notable

concern, particularly for certain demographics within the audience. Adolescent viewers, who are in the process of forming their self-identity and body perception, as well as those who are already preoccupied with their physical appearance, may be especially vulnerable to these depictions. Regular exposure to idealized body types can lead individuals to compare their own bodies unfavorably, resulting in dissatisfaction and negative self-assessment (Sherlock & Wagstaff, 2019). This can have a detrimental effect on self-esteem, as viewers may perceive themselves as inadequate or lacking when compared to the highly athletic and muscular participants they see on the program.

Moreover, these portrayals may encourage the acceptance of excessive physical fitness and muscularity as desirable traits. The success and widespread admiration of participants who embody these physical ideals may lead to the belief that achieving and showcasing such levels of fitness and muscularity are not only attainable but also essential for societal approval and recognition. This belief can result in increased body dissatisfaction among viewers as they strive to meet these unrealistic and potentially unattainable standards. In some cases, this dissatisfaction may escalate into more serious issues, such as the development of body image disorders, including muscle dysmorphia. Individuals who are consistently exposed to and influenced by these idealized images may engage in harmful behaviors— such as excessive exercise, restrictive eating patterns, or even substance abuse (Krawiec, 2008)—in an attempt to replicate the physiques they see on the show.

When examining the cultural and societal impact of 'Survivor' TV series, it becomes clear that the portrayal of physical fitness and body image in these programs is not merely a matter of personal preference or entertainment. It has significant implications for how society perceives and values physical standards, potentially affecting the body image and mental well-being of its viewers. This analysis underscores the importance of understanding and addressing the broader effects of media influences on public perceptions of physical standards and the potential consequences for body image and overall well-being.

The Psychological Impact of Media on Body Image

Overview of Research on the Influence of Media on Body Image Perceptions

The impact of media on body image has been extensively studied (Spurr et al., 2013; Duggan & McCreary, 2013; Leit, 2002), revealing the significant role media plays in shaping individuals' perceptions of body image and ideals of physical attractiveness. Research across various fields consistently demonstrates that media exposure heavily influences the establishment and reinforcement of societal standards of beauty. These studies encompass a wide range of media formats, including television shows, magazine advertisements, social media platforms, and broader advertising campaigns.

One key finding from this research is the link between exposure to media portrayals of idealized body shapes and the development of body dissatisfaction among viewers. Frequent exposure to depictions of slim, muscular, or otherwise idealized physiques can lead individuals to view these body types as the prevailing standard and an ideal to strive for. This exposure often results in distorted perceptions of what constitutes a normal or ideal body shape and size, particularly when media representations do not reflect the diversity of body types found in reality. Continuous exposure to such images can create unrealistic expectations and standards of physical attractiveness, leading to a disconnect between an individual's actual body and the idealized portrayals seen in the media.

Moreover, the media plays a crucial role in shaping and sustaining societal standards of beauty and attractiveness. Media portrayals not only reflect existing cultural ideals but also actively influence and reinforce these standards. The extent of this impact varies across different cultures and historical periods, as each era and community has its own criteria for beauty. These norms are often disseminated and reinforced through various media channels, shaping public perceptions and attitudes toward

physical attractiveness.

The influence of media on body image is a complex issue that extends beyond mere exposure to images. It involves the internalization of these images and the ideals they represent. This process of internalization can profoundly affect an individual's self-esteem, body satisfaction, and overall mental well-being. Therefore, understanding the media's impact on body image perceptions is crucial for addressing the broader social issues related to body dissatisfaction and the pursuit of unattainable physical standards.

Connection Between Media Consumption, Body Dissatisfaction, and the Development of Body Image Disorders

The relationship between media consumption and body dissatisfaction is a critical area of study in understanding the development of body image disorders. Consistent exposure to media that promotes specific body types significantly influences how individuals perceive their own bodies. The frequent depiction of a narrow range of body types as desirable or attractive in the media can set unattainable standards that many viewers find difficult to meet. This repeated exposure often leads to a perceived gap between an individual's actual physique and the idealized images portrayed in the media. The disparity between reality and these idealized standards can result in body dissatisfaction, where individuals feel unhappy or uncomfortable with their own physical appearance (Van den Berg et al., 2007).

Body dissatisfaction is more than just a sense of unhappiness; it can be a precursor to the development of more severe body image disorders. Persistent and intense dissatisfaction can evolve into pathological preoccupations with body shape and size, laying the groundwork for conditions such as anorexia nervosa, bulimia nervosa, and body dysmorphic disorder (Rizwan et al., 2022). Continuous exposure to media portrayals of extreme thinness, for example, can contribute to the onset of anorexia nervosa, a psychological disorder characterized by an overwhelming fear of weight gain and extreme dietary restriction. Similarly, exposure to images that idealize a certain body shape can lead to the development of bulimia nervosa (Naumann et al., 2016), marked by cycles of binge eating followed by compensatory behaviors such as purging.

Media exposure can significantly impact individuals with body dysmorphic disorder, particularly those with muscle dysmorphia, a specific form of the condition. Muscle dysmorphia is characterized by an intense preoccupation with the belief that one's body lacks sufficient muscle mass or leanness, often driven by media portrayals of highly muscular and well-defined physiques. The constant exposure to these idealized images can exacerbate the disorder, leading individuals to engage in excessive exercise, strict dietary regimens, or even substance abuse in an attempt to achieve the desired body.

The influence of media on body image varies across different demographic groups (Frederick et al., 2022). Gender differences play a significant role in how media affects body image and the susceptibility to body image disorders. While much of the research on media and body image has historically focused on women and the pursuit of thinness, it is increasingly recognized that men are also significantly influenced by media representations of muscularity and physical fitness. These gendered differences in media influence highlight the need to understand the complex ways in which media impacts body image across diverse demographics, considering factors such as age, gender, and cultural background.

Understanding the relationship between media consumption, body dissatisfaction, and the development of body image disorders is essential for addressing the broader social issue of body image concerns. It underscores the importance of promoting media literacy and advocating for a more diverse and realistic representation of body types in media to mitigate the negative effects on viewers' body image and self-esteem.

<center>**Muscle Dysmorphia and Media Influence**</center>

Direct Link Between 'Survivor' TV Shows and Muscle Dysmorphia Risk

A crucial aspect of understanding the influence of media on body image disorders is examining the potential direct correlation between the portrayal of physical fitness and strength in 'Survivor' TV series and the likelihood of developing muscle dysmorphia (Mitchell et al., 2017). These reality programs often feature participants who exemplify well-developed, athletic bodies, presenting them as idealized representations of physical power and endurance. The portrayal of these contestants, frequently depicted as the epitome of physical strength and attractiveness, can significantly shape viewers' perceptions of what constitutes an ideal physique. This influence is particularly strong regarding standards of muscularity and physical fitness, as the program tends to exalt and idealize these traits.

Regular exposure to 'Survivor' TV series and its idealized portrayals of physical form may lead to increased dissatisfaction with one's own body. This effect can be especially pronounced in individuals already preoccupied with their muscularity or those aspiring to achieve a similar level of physical fitness. The contrast between the viewer's personal physique and the prominently muscular and fit contestants showcased on the program can amplify feelings of inadequacy and dissatisfaction. For many, this can result in a negative self-image and a compulsion to alter their physical appearance to align with what they see on the screen.

The glorification of exceptional physical fitness and strength in 'Survivor' television programs can set unrealistic and potentially unattainable standards for the human physique. While the show presents these traits as desirable and achievable, they may not be practical or beneficial for the average viewer. Consistent exposure to such standards can trigger or worsen muscle dysmorphia in individuals who are predisposed to it. Those already concerned with body size and muscularity may find that these media portrayals validate their anxieties, leading them to engage in behaviors characteristic of muscle dysmorphia, such as excessive exercise, strict dietary restrictions, or the use of performance-enhancing substances.

In summary, the depiction of physical fitness and strength in 'Survivor' television programs has the potential to shape viewers' perceptions of an ideal physique and contribute to dissatisfaction with their own bodies. This dissatisfaction, in turn, could increase the risk of developing or exacerbating muscle dysmorphia, particularly among those already preoccupied with their level of muscularity and physical fitness.

Discussion of How These Shows Might Reinforce or Exacerbate Muscle Dysmorphia Symptoms

The impact of the 'Survivor' television series extends beyond the potential risk of developing muscle dysmorphia; it also has the capacity to intensify the symptoms in individuals who already suffer from the disorder. Continuous exposure to the idealized, muscular bodies featured on these programs can significantly reinforce and exacerbate the distorted beliefs characteristic of muscle dysmorphia. Individuals struggling with the disorder may find that watching contestants who exemplify their ideal of muscularity and fitness reinforces the belief that their own bodies are inadequately developed. This reinforcement of a distorted body image can worsen the symptoms of muscle dysmorphia, making it more challenging for individuals to overcome their preoccupations and anxieties.

The intense and competitive nature of 'Survivor' TV series is another aspect that may strongly resonate with those dealing with muscle dysmorphia. The program often glorifies physical endurance, strength, and competition—qualities that align closely with the beliefs and behaviors associated with muscle dysmorphia. Individuals with the disorder may find that the emphasis on physical challenges and the success of participants with well-developed muscles reinforces their drive to engage in excessive

training and their desire for an extremely muscular physique. This validation can exacerbate harmful behaviors such as overtraining, restrictive dieting, and the use of performance-enhancing substances. The show's portrayal of physical strength as essential for success and admiration may intensify the cognitive patterns linked to muscle dysmorphia, further entrenching individuals in the cyclical nature of the condition.

Furthermore, by emphasizing physical strength, 'Survivor' television programs may indirectly suggest that these qualities are not only desirable but also essential for achieving success and societal approval. This message can be particularly harmful to individuals with muscle dysmorphia, as it reinforces the belief that their self-worth and societal value are tied to attaining a certain level of muscularity. The potential for these shows to validate and intensify the harmful behavioral and cognitive patterns associated with muscle dysmorphia highlights the need for a thorough examination of media portrayals and their impact on mental well-being.

In exploring the connection between 'Survivor' TV series and muscle dysmorphia, it is crucial to understand how these widely viewed media representations may contribute to the perpetuation and worsening of the disorder. Developing a comprehensive understanding of this relationship is essential for creating effective strategies to mitigate the negative effects of media on individuals struggling with muscle dysmorphia.

Case Studies and Empirical Evidence

An in-depth analysis of individual case studies and empirical data provides a clearer understanding of the correlation between 'Survivor' TV episodes and muscle dysmorphia. The study conducted by Hargreaves and Tiggemann (2009) explored the relationship between muscle dysmorphia, social comparisons, and body schema. Their research revealed that males susceptible to muscle dysmorphia exhibited altered patterns of social engagement, underscoring the significant impact of body image concerns on social behavior. This finding suggests that media portrayals of idealized body types, such as those featured in 'Survivor' television programs, may amplify feelings of social isolation and exacerbate symptoms of muscle dysmorphia.

In a pivotal study by Pope et al. (1997), muscle dysmorphia was defined as a subtype of body dysmorphic disorder characterized by an excessive preoccupation with perceived insufficient muscle development. This research highlights the powerful role of media in shaping individuals' perceptions of physical size and muscularity. The study's findings indicate that regular exposure to highly athletic and muscular individuals in media, such as in reality TV series like 'Survivor,' can significantly contribute to the onset and worsening of muscle dysmorphia symptoms.

Blond (2008) conducted a study in the field of body image, examining the effects of exposure to images of idealized bodies on male body dissatisfaction. The review suggested that such exposure can lead to negative body image perceptions and potentially contribute to the development of disorders like muscle dysmorphia. This study indicates that 'Survivor' television programs, known for their focus on physically strong and muscular participants, may influence viewers' perceptions of their own bodies and contribute to the development of body image issues.

These studies, conducted by leading scholars in the field, provide important insights into the correlation between media consumption—particularly reality TV programs like 'Survivor'—and the risk of developing muscle dysmorphia. They highlight the importance of considering the impact of media portrayals on viewers' self-perception and the potential for these depictions to contribute to the onset and exacerbation of muscle dysmorphia and other body image disorders.

Mitigation and Intervention

To mitigate the detrimental effects of 'Survivor' TV shows and similar media on viewers' body image, a comprehensive strategy is essential. This approach should include educating viewers, fostering media literacy, and providing psychological support and public health initiatives.

Education is a crucial component in reducing the negative impacts of these shows. It is important for viewers to understand the realities of media production, including the use of editing, lighting, and casting, which can create unrealistic and unattainable body ideals. By gaining awareness of these aspects of media creation, viewers can develop a more critical perspective and are less likely to internalize harmful body image standards. Additionally, promoting the representation of a diverse range of body types in media can help normalize various body shapes and sizes, thereby reducing the emphasis on a single, idealized body type. Implementing educational programs in schools that address topics such as body image, media influence, and self-esteem can be particularly effective, especially for young people who are in the process of developing their body image and self-perception.

Media literacy plays a crucial role in addressing the impact of media on body image. Media literacy education empowers individuals to understand and critically analyze the content they consume. The focus should be on developing the ability to recognize and evaluate media messages related to body image and physical ideals. By incorporating media literacy programs into school curricula and public education campaigns, individuals of all ages can be equipped with the skills needed to critically assess media content and mitigate its negative effects on body image.

Psychological support, including counseling and therapy, is essential for individuals struggling with body image issues or disorders such as muscle dysmorphia. This support can address underlying issues, boost self-esteem, and help individuals develop more positive body image perspectives. Public health initiatives can also play a significant role in raising awareness about the impact of media on body image. These initiatives should promote positive body image messages, encourage the acceptance of diverse body shapes, and provide resources for those seeking help. Collaborations among mental health professionals, educators, and media creators can lead to more thoughtful and compassionate portrayals of body image in media.

To effectively reduce the negative impact of 'Survivor' TV shows and similar media on body image, a holistic approach is necessary, incorporating elements such as education, media literacy, psychological support, and public health campaigns. These efforts can foster a healthier and more realistic understanding of body image in society, helping viewers navigate media content with a well-informed and critical perspective.

Conclusion

This review has explored the complex relationship between 'Survivor' television programs and the susceptibility to muscle dysmorphia, thoroughly investigating various aspects, including the portrayal of physical fitness and strength, the impact of media on body image perceptions, and the potential exacerbation of muscle dysmorphia symptoms. The key findings suggest that the depiction of idealized, muscular physiques in these television programs can significantly influence viewers' perceptions of their own bodies and self-worth, potentially leading to body dissatisfaction and the onset or worsening of muscle dysmorphia.

The research presented underscores the importance of understanding the impact of media on mental well-being. In the context of muscle dysmorphia, it is clear that media portrayals of physical fitness and strength can profoundly affect body perceptions, particularly among individuals already vulnerable to body image issues. Continuous exposure to idealized body types may set unattainable standards, leading

to harmful body perceptions and intensifying symptoms of muscle dysmorphia.

This review emphasizes the need for comprehensive strategies to mitigate the negative effects of media on body image. Efforts in education, media literacy promotion, psychological support, and public health campaigns are essential in fostering a healthier and more realistic understanding of body image. By addressing these issues, we can cultivate a more informed society that is better equipped to navigate the often idealized representations of body image in the media.

Ultimately, examining the connection between 'Survivor' television programs and muscle dysmorphia sheds light on the broader implications of media's influence on mental well-being. It calls for a thorough analysis of media content and a concerted effort to promote positive and diverse representations of body image. Understanding and addressing the media's impact on mental health, particularly in relation to body image disorders like muscle dysmorphia, is crucial for the overall well-being of individuals and society.

Compliance with Ethical Standards

Ethical Approval

Ethical approval for this study is not applicable.

Author Contributions

The author confirms the sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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ORIGINAL RESEARCH

Bangladesh's Rankings in Global Governance and Justice Indexes: University Students' Perception Analysis

Bangladeş'in Küresel Yönetişim ve Adalet Endekslerindeki Sıralamaları: Üniversite Öğrencilerinin Algı Analizi

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Abstract

This study examines the relationship between Bangladesh's low rankings in international governance and justice indexes and the perceptions of 200 university students. The research problem focuses on understanding how these poor rankings correspond to the students' views on key areas such as judicial independence, human rights protection, freedom of speech and press, government influence on the legal system, and corruption. The findings indicate a significant alignment between students' perceptions and Bangladesh's poor rankings, revealing deep-seated concerns in these domains. The research also highlights students' positive views on the importance of an effective judiciary for economic growth and the necessity of public awareness about the legal system. Employing a mixed-method approach, this study combines secondary data from international indexes with primary data from student questionnaires, providing a comprehensive analysis of the governance, justice, and legal system issues in Bangladesh. These insights emphasized the need for targeted policy reforms and further research to address the identified challenges.

Keywords: Bangladesh, International indexes, University students, Governance, Perceptions.

Öz

Bu çalışma, Bangladeş'in uluslararası yönetişim ve adalet endekslerindeki düşük sıralamaları ile 200 üniversite öğrencisinin algıları arasındaki ilişkiyi incelemektedir. Araştırma sorunu, bu kötü sıralamaların öğrencilerin yargı bağımsızlığı, insan haklarının korunması, ifade ve basın özgürlüğü, hükümetin hukuk sistemine olan etkisi ve yolsuzluk gibi temel alanlardaki görüşleriyle nasıl bir ilişki içerisinde olduğunu anlamaya odaklanmaktadır. Bulgular, öğrencilerin algıları ile Bangladeş'in kötü sıralamaları arasında önemli bir uyum olduğunu göstererek, bu alanlarda derinlemesine endişeleri ortaya koymaktadır. Araştırma ayrıca, öğrencilerin ekonomik büyüme için etkili bir yargı sisteminin önemine ve halkın hukuk sistemine dair farkındalığın gerekliliğine dair olumlu görüşlerini vurgulamaktadır. Karma yöntem yaklaşımını benimseyen bu çalışma, Bangladeş'teki yönetişim, adalet ve hukuk sistemine dair sorunları kapsamlı bir şekilde analiz etmek için uluslararası endekslerden elde edilen ikincil veriler ile öğrenci anketlerinden elde edilen birincil verileri birleştirmektedir. Bu içgörüler, belirlenen zorlukları ele almak için hedeflenmiş politika reformlarına ve daha fazla araştırmaya olan ihtiyacı vurgulamaktadır.

Anahtar Kelimeler: Bangladeş, Uluslararası endeksler, Üniversite öğrencileri, Yönetişim, Algılar.

Bangladesh's Rankings in Global Governance and Justice Indexes: University Students' Perception Analysis

In today's interconnected world, international indexes serve as crucial benchmarks for assessing a country's performance across various domains. For Bangladesh, a nation aspiring to achieve sustainable development and global recognition, its low rankings in international indexes have raised concerns and prompted a closer examination of the underlying factors contributing to this situation. This research paper explores the relationship between Bangladesh's poor rankings in international indexes and the perceptions of university students, offering valuable insights into the country's governance, justice, and legal system.

The significance of this research lies in its potential to provide perspectives on the root causes of Bangladesh's low rankings in international indexes. University students, as a well-educated segment of the population with a deep understanding of governance and the legal system, offer valuable insights into the challenges and areas of improvement. While their perceptions do not directly resolve corporate governance problems, they are important for understanding the issues and framing potential solutions. Viewing the survey outcomes as a means to address these pertinent issues, rather than as immediate fixes, provides a realistic approach to tackling governance challenges.

Understanding the perceptions of university students is crucial, as they represent future leaders, professionals, and stakeholders for change in Bangladesh (Islam, 2010). Their perspectives provide deeper insights into the root causes of governance challenges. By gaining a deeper understanding of the concerns and priorities of university students, policymakers and stakeholders can implement informed interventions and policy reforms to address these issues, ultimately working towards improving Bangladesh's rankings in international indexes.

This research aims to empower policymakers and stakeholders to take proactive measures that address the concerns raised by university students. Efforts to enhance good governance, protect human rights, and strengthen the rule of law can be aligned with the perspectives and aspirations of the future generation. By contributing to evidence-based policymaking, this research supports initiatives that foster a more inclusive and prosperous future for Bangladesh. implemented (Sheikh, 2021).

In conclusion, this research paper explores the relationship between Bangladesh's low rankings in international indexes and the perceptions of university students. By exploring the connections between objective rankings and subjective viewpoints, and through evidence-based policymaking and targeted interventions, Bangladesh can address these concerns. This study aims to pave the way towards a brighter future marked by improved governance, justice, and overall performance on the international stage.

Literature Review

Several studies have explored the connection between international rankings and public perceptions, specifically focusing on university students' perceptions, revealing valuable insights into the factors influencing a country's standing. This literature review incorporates the perspectives of various scholars and emphasizes the perceptions of university students in Bangladesh and other countries regarding global governance and justice indexes.

Table 1

Literature Review

Study Reference	Study Focus	Methodology	Key Findings
Gu et al. (2020)	Global Justice Index and country contributions to global justice	*Multiyear research project*	Conceptual framework and evaluative principles to measure each country's contribution to global justice
Sabbagh (2007)	Intergenerational justice perceptions among university students	*Comparative analysis of 2075 students*	Support for resource transfers higher in social-democratic and conservative regimes Correlates with welfare-statist ideological frame
Mahmud and Mahmud (2024)	Good governance and student politics in university of Bangladesh	*Qualitative analysis*	Student politics impede effective governance.
Rabbani and Chowdhury (2014)	Quality of higher education in Bangladesh	*Survey of 100 master's students at Rajshahi University*	Governance issues, ineffective policy implementation, and personal/political influence impact higher education quality
Khan (2023)	Evaluation of Bangladesh universities in global rankings	*Systematic literature review*	Developing countries' universities face challenges in global rankings due to lack of adaptation to ranking indicators
Julián and Bonavia (2022)	Students' perceptions of university corruption in a Spanish public university	*Online survey of 933 students, path analysis*	Justifiability, risk perception, and perceived prevalence of corruption predict corrupt intention Willingness to report corruption is influenced by these factors
Akhayeva and Turgunbayeva (2023)	Impact of anti-corruption education on perceptions of anomie among undergraduate students	*Mixed-methods research with pre- and post-test surveys, semi-structured interviews*	Anti-corruption education significantly reduces anomie Enhances understanding of corruption's negative consequences
Rahman (2023)	Students' perceptions toward corruption in Malaysia	*Questionnaire survey of 115 students*	Awareness of corruption, recognition of corrupt acts involving large sums Acceptance of minor corrupt practices for efficiency
Palizvan et al. (2022)	Relationship between corruption perception and organizational justice.	*Descriptive cross-sectional study of 182 employees*	Negative correlation between perception of corruption and organizational justice Significant associations with demographic characteristics
Tamanna (2018)	Political perception of youth in Bangladesh	*Mixed methods*	Significant gap between youth and traditional political structures
A. Hossain et al. (2022)	Cyberbullying among university students	*Focus group discussions*	High prevalence of cyberbullying Significant impact on students' mental health
Mazumder (2014)	Quality in public and private universities in Bangladesh	*Comparative survey analysis of student satisfaction*	Higher satisfaction in private universities Public universities struggle with regulatory inefficiencies
Kumar et al. (2019)	Perception and knowledge on climate change among university students	*Survey of 370 students using statistical methods*	Students see deforestation as a main cause of climate change View government as key actor in mitigation

Shoeb and Ahmed (2021)	Service quality of public university libraries	*Survey using LibQUAL+ core items*	Significant gaps between students' expectations and actual service quality in university libraries
Hossain et al. (2021)	COVID-19 vaccine acceptability among university students	*Descriptive and multinomial logistic analysis of 400 students*	Positive attitudes towards vaccination Significant vaccine hesitancy due to misinformation and side effect concerns
Rahman (2013)	Quality higher education and students' perception in private universities	*Structured questionnaire survey of 500 students*	Quality higher education correlates with positive student perceptions Multiple quality dimensions identified
Mohammad Shahidul Islam (2019)	Curriculum gaps in business education	*Survey of alumni, employers, faculty, and students*	Significant gaps between curriculum and industry needs Recommendations for aligning education with job market demands
Sultana and Nasrinq (2021)	Student satisfaction in academic services	*Comparative study using surveys*	Private university students' satisfaction is lower than public university students
Sarkar et al. (2021)	Perceptions of online classes during COVID-19	*Online survey of Islamic University students*	Majority prefer conventional learning Face difficulties with virtual classes Positive perception among urban and Wi-Fi users

Source: Authors compilation, 2024

Table 1 highlights the critical connection between university students' perceptions and Bangladesh's rankings in global governance and justice indexes. The studies provide insights into the challenges and opportunities for improving Bangladesh's standing by addressing governance issues, enhancing transparency, and improving educational quality. Additionally, the review includes studies from other countries to offer a comparative perspective and highlight global trends in student perceptions and their impact on national rankings.

Methodology

Mixed-Method Approach

This research utilized a mixed-method approach (Creswell, 1999; Teng et al., 2020), incorporating both secondary data collection from international indexes and primary data collection through questionnaires administered to first- to fourth-year university students in Bangladesh (S. F. A. Hossain et al., 2022). This dual approach was chosen to ensure a comprehensive understanding of the topic by integrating quantitative data from reputable international sources with qualitative insights from a specific demographic within Bangladesh (Deb et al., 2023). An in-depth review of relevant literature was conducted to provide context and background for the study. This review included examining legal provisions, policies, and regulations associated with international indexes. Additionally, previous research focusing on the perceptions and viewpoints of university students was considered to frame the current study within the existing body of knowledge.

Secondary Data Collection

The data collection process for international indexes involved obtaining information from reputable sources to ensure the accuracy and reliability of the data. The details of these secondary sources are presented in Table 2.

Table 2

Secondary Sources of Data Collection

Index	Year	Source	International Applicability
World Justice Project (WJP) Rule of Law	2023	Official website	High
Freedom in the World	2023	Official website	High
Transparency International	2023	Official website	High
Economist Intelligence Unit Country Ratings	2023	Official website	High
Global Insights Country Risk Ratings	2023	Official website	High
World Bank CPIA	2023	Official website	High
International Country Risk Guide (ICRG)	2023	Official website	High
Varieties of Democracy (V-Dem) Project	2023	Official website	High
World Economic Forum (WEF) Executive Opinion Survey	2023	Official website	High
Bertelsmann Stiftung's Transformation Index (BTI)	2023	Official website	High

Source: Authors compilation, 2024

Primary Data Collection

To gather data on the perceptions of university students in Bangladesh, a systematic and well-structured approach was followed. The target population was identified as university students in the country. A set of 10 carefully crafted questionnaires was developed, covering diverse aspects of governance, justice, and the legal system. The questionnaires were designed using a rating scale of 0 to 5 to facilitate quantitative analysis.

Sample Selection and Justification

A sample of 200 university students was selected for this study. The sample size was determined based on several methodological considerations:

- *Focused Demographic:* University students represent a critical demographic for this study, providing informed insights into governance and legal issues. Their homogeneity in terms of education and exposure to these issues allows for a focused analysis.

- *Precedent in Literature:* Previous studies in similar contexts have employed comparable sample sizes to yield significant insights (Palizvan et al., 2022; Rabbani & Chowdhury, 2014; Rahman, 2023). This precedent supports the adequacy of the chosen sample size for the objectives of this study.

- *Data Saturation:* Qualitative research principles suggest that data saturation—where no new information is observed—can be achieved with relatively smaller samples when the population is homogenous (Guest et al., 2006). The consistency of responses among university students indicated that data saturation was reached, ensuring the reliability of findings.

Ensuring Data Integrity

Special care was taken to ensure the confidentiality and anonymity of the respondents to encourage honest feedback. The collected responses were meticulously recorded, and average ratings for each questionnaire were calculated based on the input from 200 students. The data collection process adhered to rigorous standards to ensure accuracy and reliability, thereby providing a solid foundation for valuable insights to aid policymakers, government officials, and stakeholders in addressing critical issues and enhancing Bangladesh's performance in governance and justice-related areas.

Reliability Analysis

To ensure the robustness of the data collected, a reliability analysis was conducted. The Cronbach's Alpha for the questionnaire items was calculated, resulting in values ranging from 0.78 to 0.88, which are considered acceptable for social science research (Nunnally et al., 1977; Tavakol & Dennick, 2011). This high level of internal consistency emphasized the reliability of the measurement instruments used in the study

Table 3

Reliability Analysis of Questionnaire Items

Questionnaire Item	Cronbach's Alpha
Independence level of the Judiciary	0.82
Role of the Judiciary in ensuring the protection of Human Rights	0.85
Freedom of Speech and Press	0.78
Role of the Ruling Government in shaping the Legal System	0.80
Effectiveness, Transparency, and Accountability of Law Enforcement	0.83
Effectiveness of the Judiciary in addressing Corruption	0.79
Satisfaction with the Efficiency and Timeliness of the Legal System	0.81
Accessibility of Justice for marginalized communities	0.84
Importance of the effective functioning of the Judiciary	0.88
Importance of public awareness and education about the Legal System	0.86

Source: Authors compilation, 2024

Data Analysis

The data analysis was conducted using a systematic approach (Barat et al., 2017), integrating both primary and secondary data. Primary data, collected through questionnaires administered to university students, and secondary data from international indexes were combined to provide a comprehensive analysis.

Weighting of Data

To ensure balanced integration, equal weight was assigned to both primary and secondary data. This approach allowed for a holistic view, incorporating both the perceptions of the students and the objective metrics from international indexes. Traditional analytical methods were employed, including the following steps:

- *Data Assembly:* Primary and secondary data were compiled and organized systematically.

- *Review and Analysis:* Both data sets were reviewed independently and then combined. Statistical methods were applied to the primary data to quantify students' perceptions, while qualitative assessments were conducted on the secondary data.

- *Summarization:* The findings from both data sources were carefully summarized to provide clear insights.

The research was conducted collaboratively by three individuals, ensuring thorough cross-verification and validation of the results. This triad analysis ensured that the study maintained methodological rigor and provided reliable insights into governance and justice issues in Bangladesh. The research is processed via Microsoft Word, Excel, and Microsoft Power BI for data analysis.

<div align="center">**Results and Analysis**</div>

Performance of Bangladesh in International Indexes

The WJP Rule of Law Index is a comprehensive assessment tool that measures the adherence to the rule of law in countries around the world. It evaluates various factors related to governance, justice, and the legal system to provide insights into the overall state of the rule of law within a country. For Bangladesh, the WJP Rule of Law Index 2022 reveals that the overall score is 0.39, and a 0.38 score is shown for 2023, indicating a relatively low performance in upholding the rule of law. Bangladesh is ranked 127th out of 140 countries assessed in the index, highlighting areas for improvement (WJP, 2023a). The index consists of multiple factors that are critical for the rule of law. The scores for each factor in Bangladesh are as follows:

Constraints on Government Powers

The score for this factor is 0.38, indicating a limited extent to which those who govern are bound by law. Bangladesh ranks 118th globally, highlighting the need for effective limitations on government powers (WJP, 2023a).

Absence of Corruption

The score for this factor is 0.34, indicating challenges in combating corruption within the government. Bangladesh ranks 113th globally (WJP, 2023a), emphasizing the importance of addressing bribery, improper influence, and misappropriation of public funds.

Open Government

The score for this factor is 0.41, indicating room for improvement in government transparency and citizen participation. Bangladesh ranks 104th globally (WJP, 2023a), emphasizing the need for better dissemination of laws, access to information, and civic participation.

Fundamental Rights

The score for this factor is 0.30, highlighting challenges in ensuring and protecting core human rights. Bangladesh ranks 135th globally (WJP, 2023a), indicating the importance of addressing equal treatment, due process, freedom of expression, and other fundamental rights.

Order and Security

The score for this factor is 0.63, indicating relatively better performance in ensuring the security of persons and property. Bangladesh ranks 110th globally (WJP, 2023a), showcasing the need for continued efforts in controlling crime and limiting civil conflicts.

Regulatory Enforcement

The score for this factor is 0.40, highlighting challenges in the fair and effective implementation and enforcement of regulations. Bangladesh ranks 121st globally (WJP, 2023a), emphasizing the importance of enforcing government regulations without improper influence.

Civil Justice

The score for this factor is 0.37, indicating limitations in accessing affordable and effective civil justice. Bangladesh ranks 130th globally (WJP, 2023a), underscoring the importance of ensuring accessible, impartial, and efficient civil justice systems.

Criminal Justice

The score for this factor is 0.31, pointing to challenges in delivering effective criminal justice.

Bangladesh ranks 120th globally (WJP, 2023a), highlighting the importance of improving criminal investigation systems, adjudication processes, and correctional systems.

These findings proved that Bangladesh faces significant challenges in various aspects of governance, justice, and the legal system. Addressing these challenges can contribute to strengthening the rule of law, promoting transparency, accountability, and protecting fundamental rights within the country. Freedom in the World 2023 provides an assessment of the state of political rights and civil liberties in countries around the world. The index evaluates various aspects of governance, including electoral processes, political pluralism, freedom of expression and belief, protection of human rights, functioning of government institutions, rule of law, and personal autonomy. In the case of Bangladesh, the report indicates that the country is categorized as "Partly Free" with a score of 40 out of 100 (Freedom House, 2023). The ruling Awami League (AL) has been criticized for consolidating political power through harassment of the opposition, critical media, and civil society (Andersen, 2021; Jackman, 2021; Riaz, 2021). Corruption is pervasive, and efforts to combat corruption have been hindered by politicized enforcement (Zafarullah & Huque, 2021). Due process guarantees are poorly upheld, and security forces frequently violate human rights with impunity (Uddin, 2023).

The report highlights significant challenges faced by religious minorities and refugees in Bangladesh, particularly Rohingya who have fled Myanmar. It acknowledges some positive developments, such as a reduction in extrajudicial killings by security forces in 2022 and the opposition's ability to hold major rallies. However, concerns persist regarding the independence of the judiciary, restrictions on freedom of expression and media freedom, discrimination against minority groups, and limitations on academic freedom (Freedom House, 2023). The index underscores the need for improvements in electoral processes, political pluralism, protection of human rights, transparency, and equal treatment of various segments of the population. It also emphasizes the prevalence of corruption, weak rule of law, and the culture of impunity. Additionally, the report highlights challenges related to freedom of assembly, freedom for non-governmental organizations (NGOs), trade unions, and the status of personal social freedoms.

In conclusion, the Freedom in the World 2023 report indicates that Bangladesh faces several significant challenges in upholding political rights, civil liberties, and the rule of law. The findings suggest a need for targeted reforms to address issues such as political harassment, corruption, human rights abuses, discrimination against minority groups, and limitations on freedom of expression and assembly.

The Corruption Perceptions Index (CPI) 2022 ranks countries based on perceived levels of corruption within their public sectors. Bangladesh received a CPI score of 25 out of 100, indicating a relatively high level of perceived corruption. The country was ranked 147th out of 180 countries surveyed. The CPI score is based on data from eight different sources and has a standard error of 1.93. The lower confidence interval (CI) for Bangladesh's CPI score is 22, while the upper CI is 28 (TIB, 2023).

In addition to the CPI, several other indexes and ratings provide further insights into the country's governance and corruption situation. The Bertelsmann Stiftung's Transformation Index (BTI) gave Bangladesh a score of 25 (BTI, 2024). The Economist Intelligence Unit Country Ratings scored the country 20 (EIU, 2024), while Global Insights Country Risk Ratings and World Bank CPIA gave scores of 22 and 27 respectively (GlobalData, 2024; IEG, 2024). The International Country Risk Guide (ICRG) Guide assessed Bangladesh with a score of 41, indicating a relatively higher risk level (ICRG, 2024). The Varieties of Democracy (V-Dem) Project assigned a score of 13, suggesting challenges in democratic governance (V-Dem, 2024). The World Economic Forum (WEF) Executive Opinion Survey rated Bangladesh at 33, and the World Justice Project Rule of Law Index scored the country 23 (Forum, 2022; WJP, 2023b).

These ratings and indexes collectively indicate the existence of corruption challenges and governance issues in Bangladesh. The scores reflect the perceptions of corruption, transformation, risk, democracy, rule of law, and other related aspects. Improving transparency, accountability, and anti-corruption measures would be essential for addressing the perceived corruption issues and enhancing the overall governance framework in the country (Dr. Md. Mahfuz Ashraf, 2014).

Specific Areas of Concern

Figure 1

Independence Level of the Judiciary

Rate the Independence level of the Judiciary in Bangladesh? Average Rating: 1.065
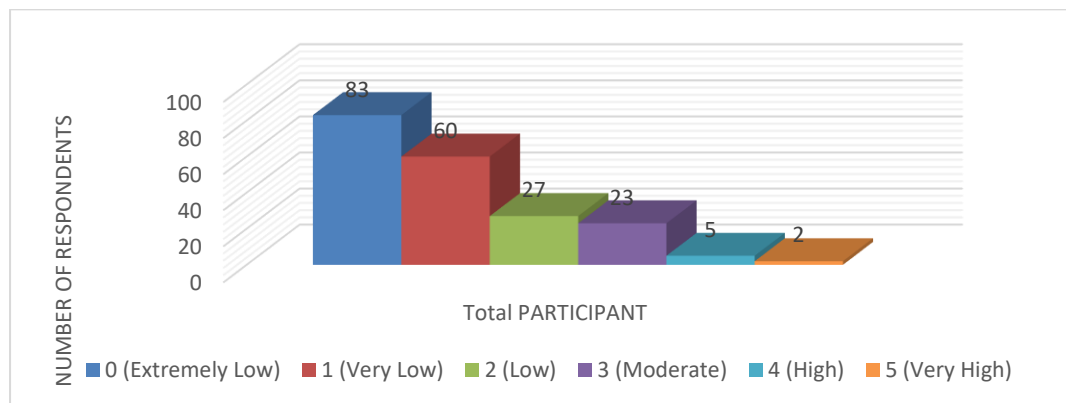
The respondents' perceptions of the independence level of the judiciary in Bangladesh vary. Most respondents, 41.5% (83 individuals), believe that the level of independence is extremely low, as indicated by their ratings of 0 (Figure 1). Only a small proportion, 1% (2 individual), rated it at the highest level of 5. Additionally, 2.5% of respondents (5 individuals) rated it at parameter 4, 11.5% (23 individuals) rated it at parameter 3, indicating a moderate level, and 13.5% (27 individuals) rated it at parameter 2. Approximately 30% (60 individuals) perceive the independence level of the judiciary in Bangladesh to be slightly better than the lowest position. The average rating of 1.065 suggests a perceived lack of independence in the judiciary, raising concerns about potential influences on judicial decisions.

Figure 2

Role of the Judiciary in Ensuring the Protection of Human Rights

Rate the role of the Judiciary in ensuring the protection of Human Rights in Bangladesh? Average Rating: 1.21
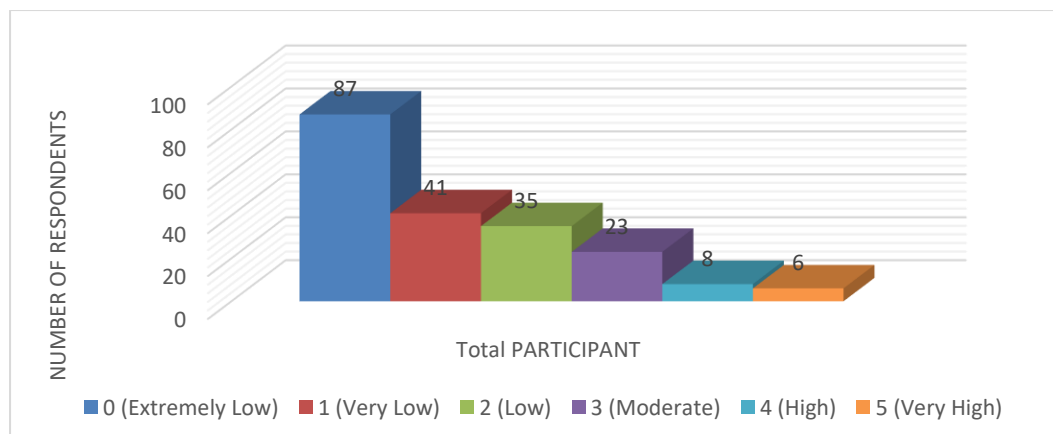
The respondents' perceptions of the role of the judiciary in ensuring the protection of human rights in Bangladesh vary. Figure 2 shows, most respondents, 43.5% (87 individuals), rated it as extremely low (0), while only 3% (6 individual) rated it at the highest level of 5. Additionally, 4 % of respondents (8 individuals) rated it at parameter 4, 11.5% (23 individuals) rated it at parameter 3, indicating a moderate role, and another 17.5% (35 individuals) rated it at parameter 2. About 20.5% (41 individuals) perceive the role of the judiciary in protecting human rights to be slightly better than the lowest position. The average rating of 1.21 suggests a perception of limited effectiveness in safeguarding human rights by the judiciary in Bangladesh.

Figure 3

Freedom of Speech and Press

What is your rate for Freedom of Speech and Press in Bangladesh? Average Rating: 0.695
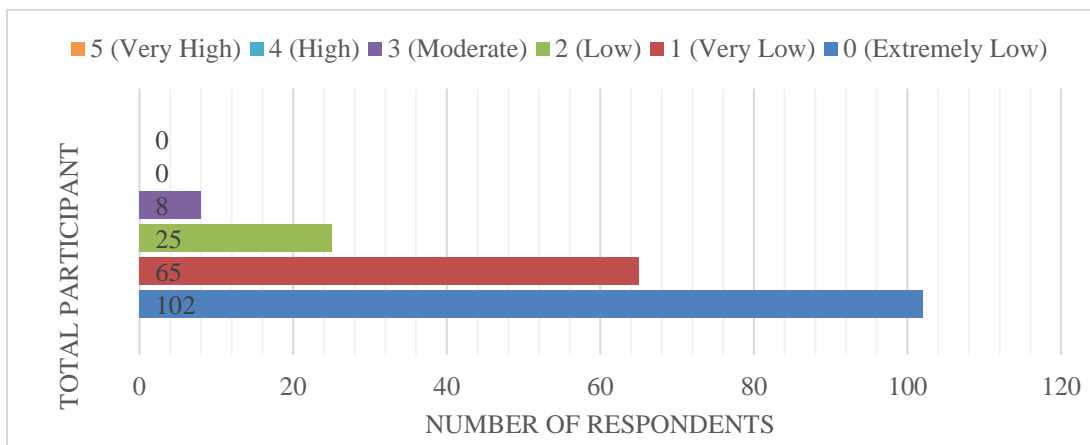

The respondents' ratings of the freedom of speech and press in Bangladesh indicate a perceived lack of freedom in this domain. Most respondents, 51% (102 individuals), rated it as extremely low (0), while neither of the individuals rated it at the highest level of 5 nor at parameter 4. Additionally, 4% (8 individuals) rated it at parameter 3, indicating a moderate level, and 12.5% (25 individuals) rated it at parameter 2. Around 32.5% (65 individuals) perceive the freedom of speech and press in Bangladesh to be slightly better than the lowest position. The average rating of 0.695 suggests a significant concern regarding limitations on freedom of expression and press freedom in the country.

Figure 4

Role of the Ruling Government in Shaping the Legal System and Upholding the Rule of Law

Rate the role of the Ruling Government in shaping the Legal System and upholding the Rule of Law in Bangladesh? Average Rating: 0.95
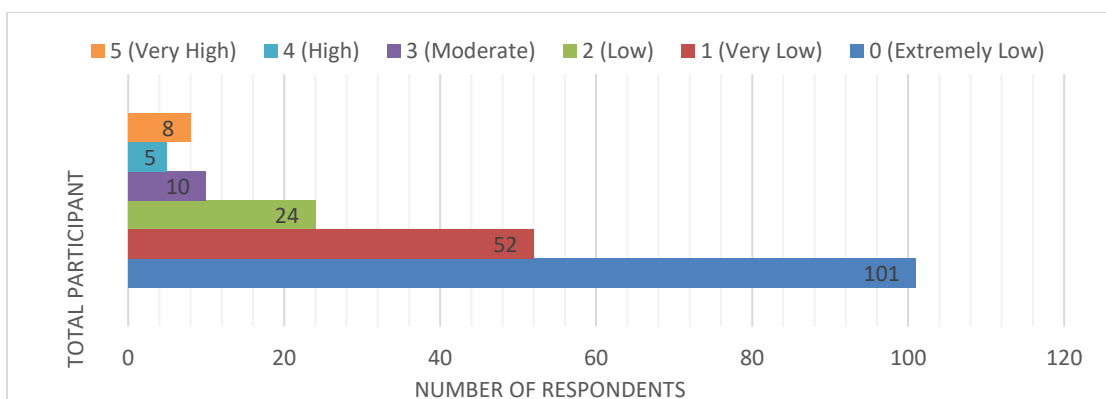
The respondents' perceptions of the role of the ruling government in shaping the legal system and upholding the rule of law in Bangladesh vary. Most respondents, 50.5% (101 individuals), rated it as extremely low (0), while only 4 % (8 individuals) rated it at the highest level of 5. Additionally, 2.5% of respondents (5 individual) rated it at parameter 4, 5% (10 individuals) rated it at parameter 3, indicating a moderate role, and 12% (24 individuals) rated it at parameter 2. About 26% (52 individuals) perceive the role of the ruling government in shaping the legal system and upholding the rule of law to be slightly better than the lowest position. The average rating of 0.95 suggests a perceived lack of effectiveness in this regard.

Figure 5

Effectiveness, Transparency, and Accountability of Law Enforcement Agencies
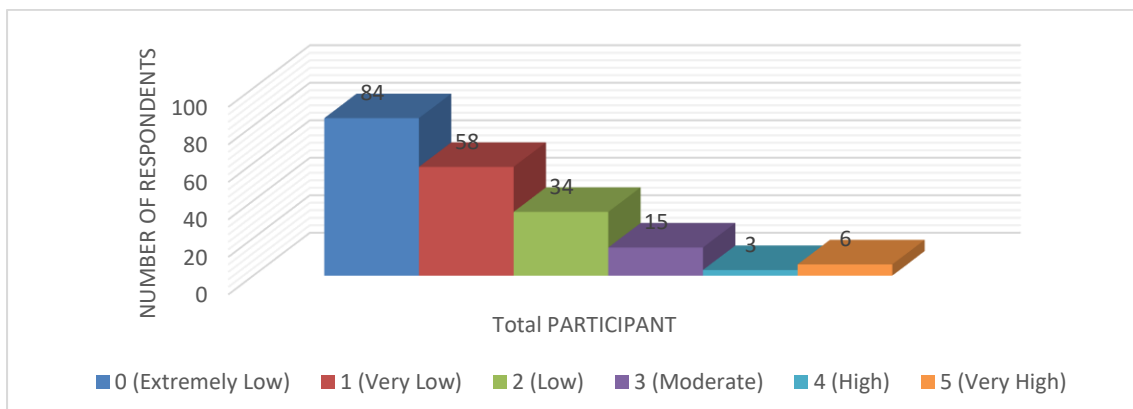
Rate the Effectiveness, Transparency, and Accountability of Law Enforcement Agencies (Police, PBI, CID, NSI, RAB, etc.) in maintaining law and order in Bangladesh? Average Rating: 0.895
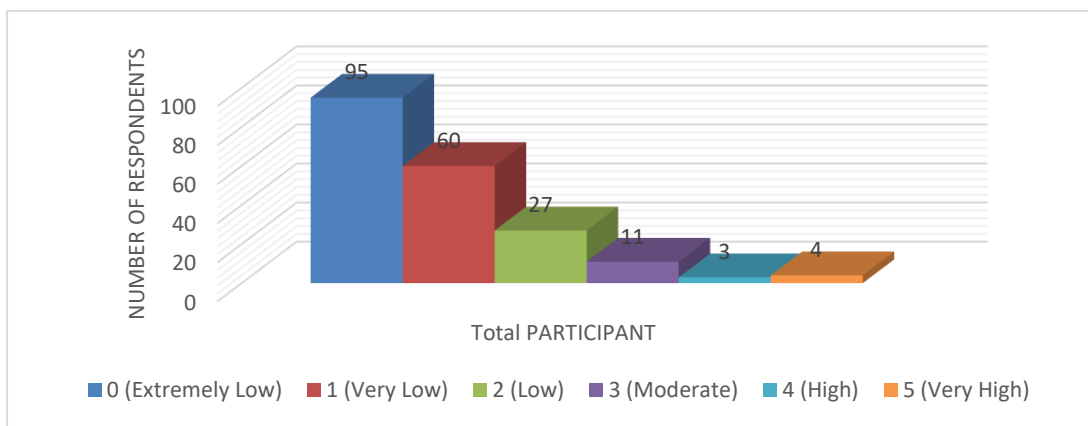
The respondents' ratings of the effectiveness, transparency, and accountability of law enforcement agencies in maintaining law and order in Bangladesh vary. Most respondents, 47.5% (95 individuals), rated it as extremely low (0), while only 2% (4 individuals) rated it at the highest level of 5. Additionally, 1.5% of respondents (3 individual) rated it at parameter 4, 5.5% (11 individuals) rated it at parameter 3, indicating a moderate level, and 13.5% (27 individuals) rated it at parameter 2. Around 30% (60 individuals) perceive the effectiveness of law enforcement agencies to be slightly better than the lowest position. The average rating of 0.895 suggests a perceived lack of effectiveness, transparency, and accountability in maintaining law and order.

Figure 6

Effectiveness of the Judiciary in Addressing Corruption and Upholding the Principles of Accountability and Transparency

Rate the effectiveness of the Judiciary in addressing Corruption and upholding the principles of Accountability and Transparency in Bangladesh? Average Rating: 1.065

The respondents' perceptions of the effectiveness of the judiciary in addressing corruption and upholding principles of accountability and transparency in Bangladesh vary. Most respondents, 42% (84 individuals), rated it as extremely low (0), while only 3% (6 individuals) rated it at the highest level of 5. Additionally, 1.5% of respondents (3 individuals) rated it at parameter 4, 7.5% (15 individuals) rated it at parameter 3, indicating a moderate level, and 17% (34 individuals) rated it at parameter 2. About 29% (58 individuals) perceive the effectiveness of the judiciary in addressing corruption to be slightly better than the lowest position. The average rating of 1.065 suggests a perceived lack of effectiveness in combating corruption and upholding accountability and transparency.

Figure 7

Satisfaction Level with the Efficiency and Timeliness of the Legal System

How satisfied are you with the Efficiency and Timeliness of the Legal System in Bangladesh? Average Rating: 0.815
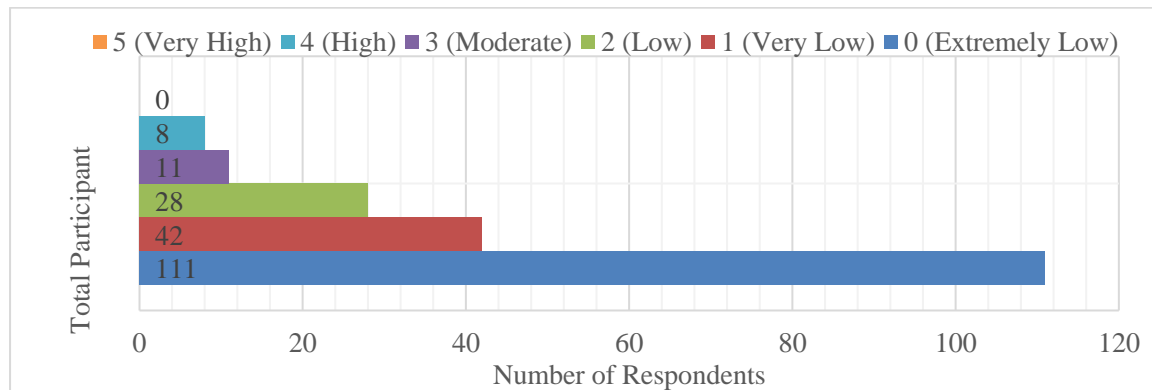

The respondents' satisfaction with the efficiency and timeliness of the legal system in Bangladesh varies. Most respondents, 55.5% (111 individuals), rated their satisfaction as extremely low (0), no individual rated it at the highest level of 5. Additionally, 4% of respondents (8 individuals) rated it at parameter 4, 5.5% (11 individuals) rated it at parameter 3, indicating a moderate level of satisfaction, and 14% (28 individuals) rated it at parameter 2. Around 21% (42 individuals) perceive the efficiency and timeliness of the legal system to be slightly better than the lowest position. The average rating of 0.815 suggests a perceived dissatisfaction with the efficiency and timeliness of the legal system.

Figure 8

Accessibility of Justice for Marginalized Communities

How would you rate the Accessibility of Justice for marginalized communities in Bangladesh? Average Rating: 1.275
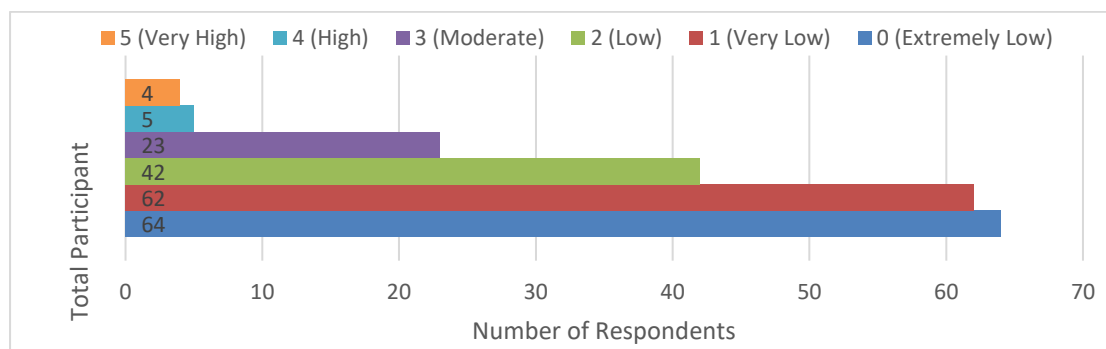
The respondents' ratings of the accessibility of justice for marginalized communities in Bangladesh indicate perceived limitations. Most respondents, 32% (64 individuals), rated it as extremely low (0), while only 2 % (4 individuals) rated it at the highest level of 5. Additionally, 2.5% of respondents (5 individuals) rated it at parameter 4, 11.5% (23 individuals) rated it at parameter 3, indicating a moderate level of accessibility, and 21% (42 individuals) rated it at parameter 2. Around 31% (62 individuals) perceive the accessibility of justice for marginalized communities to be slightly better than the lowest position. The average rating of 1.275 suggests a perceived need for improvement in providing accessible justice to marginalized communities.

Positively Viewed Areas

Figure 9

Importance of the Effective Functioning of Judiciary for Attracting Foreign Investments & Fostering Economic Growth

How important is the effective functioning of the Judiciary for attracting Foreign Investments and Fostering Economic Growth in Bangladesh? Average Rating: 3.41
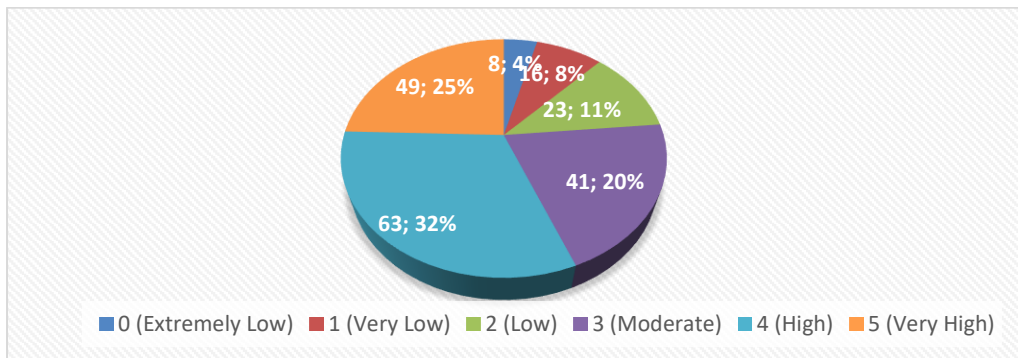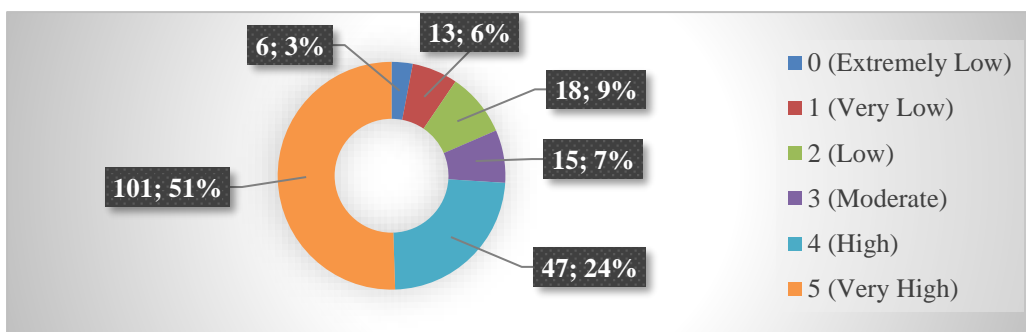

The respondents' perceptions of the importance of the effective functioning of the judiciary for attracting foreign investments and fostering economic growth in Bangladesh vary. Most respondents, 31.5% (63 individuals), rated it at the 2nd highest level of 4, while only 4% (8 individuals) rated it at the lowest level of 0. Additionally, 20.5% of respondents (41 individuals) rated it at parameter 3, indicating a moderate level of importance, and 11.5% (23 individuals) rated it at parameter 2. Around 24.5% (49 individuals) perceive the effective functioning of the judiciary to be the highest position and 8% (16 individuals) perceive to be slightly better than the lowest position. The average rating of 3.41 suggests a perceived significance of the judiciary's role in attracting foreign investments and fostering economic growth.

Figure 10

Importance of Public Awareness and education about Bangladesh's Legal System and the Rule of Law

Rate the importance of public awareness and education about Bangladesh's "Legal System" and the "Rule of Law"? Average Rating: 3.935

The respondents' ratings of the importance of public awareness and education about Bangladesh's legal system and the rule of law vary. Most respondents, 50.5% (101 individuals), rated it at the highest level of 5, while only 3% (6 individual) rated it at the lowest level of 0. Additionally, 23.5% of respondents (47 individuals) rated it at parameter 4, indicating a significant level of importance, and 7.5% (15 individuals) rated it at parameter 3. Around 9% (18 individuals) rated it at parameter 2 and 6.5% (13 individuals) perceive the importance of public awareness and education to be slightly better than the lowest position. The average rating of 3.935 suggests a perceived high importance of public awareness and education regarding the legal system and the rule of law in Bangladesh.

Comparative Analysis in One Scale

The WJP Rule of Law Index 2022 reveals that Bangladesh received an overall score of 0.39, ranking 127th out of 140 countries assessed. The index indicates challenges in areas such as constraints on government powers, absence of corruption, and fundamental rights protection. Similarly, the Freedom in the World 2023 report categorizes Bangladesh as "Partly Free" with a score of 40 out of 100, highlighting concerns about political rights, civil liberties, and human rights abuses. The CPI 2022 ranks Bangladesh 147th out of 180 countries with a score of 25 out of 100, indicating a relatively high level of perceived corruption within the public sector.

Figure 11

Performance in International Indexes (Scaled from 0 to 1)
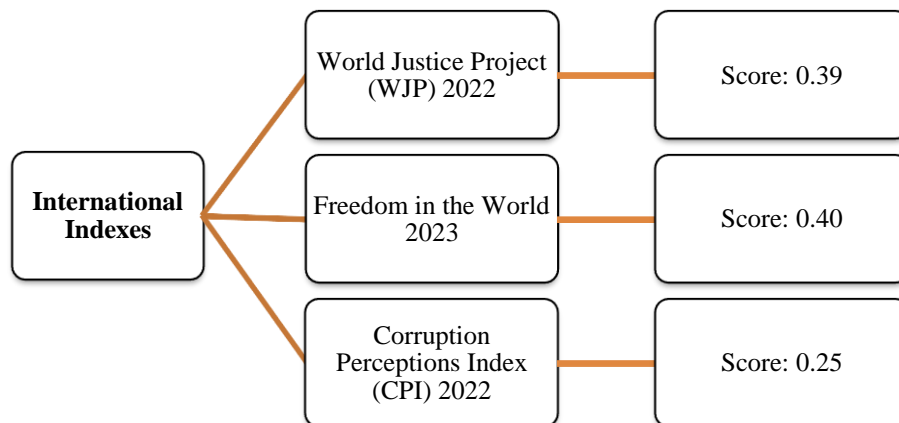
The perceptions of university students are consistent with the poor rankings in international indexes. The scaled average ratings from 0 to 1 reveal that the students perceive limitations in the independence of the judiciary (0.213), protection of human rights (0.242), freedom of speech and press (0.139), Role of the Ruling Government in shaping the Legal System and upholding the Rule of Law (0.19), and Effectiveness, Transparency, and Accountability of Law Enforcement Agencies (0.179). They also indicate a perceived lack of effectiveness in addressing corruption and upholding accountability and transparency (0.213) and dissatisfaction with the efficiency and timeliness of the legal system (0.163). Moreover, the students place significant importance on public awareness and education about the legal system and the rule of law (0.787), highlighting the need for knowledge dissemination in these areas. Additionally, the students acknowledge the importance of the effective functioning of the Judiciary for attracting Foreign Investments and Fostering Economic Growth (0.682), underlining the potential impact of a robust judicial system on the country's economic prospects.

Table 4

Perceptions of University Students (Scaled from 0 to 1)

Perceptions of Students		
	Independence level of the Judiciary	Score: 0.213
	Role of the Judiciary in protecting Human Rights	Score: 0.242
	Freedom of Speech and Press	Score: 0.139
	Role of the Ruling Government in shaping the Legal System and upholding the Rule of Law	Score: 0.19
	Effectiveness, Transparency, and Accountability of Law Enforcement Agencies	Score: 0.179
	Effectiveness of the Judiciary in addressing Corruption and upholding Accountability and Transparency	Score: 0.213
	Efficiency and Timeliness of the Legal System	Score: 0.163
	Accessibility of Justice for marginalized communities	Score: 0.255
	Importance of the effective functioning of the Judiciary for attracting Foreign Investments and Fostering Economic Growth	Score: 0.682
	Importance of public awareness and education about Bangladesh's Legal System and the Rule of Law	Score: 0.787

Based on the ratings provided by the 10 questionnaires and Bangladesh's rankings in international indexes, there seems to be a correlation between Bangladesh's poor rankings and the students' perceptions. The ratings from the questionnaires generally reflect a negative perception of Bangladesh's political rights, civil liberties, corruption levels, rule of law, and overall risk.

According to the ratings obtained from the questionnaires, the students perceive Bangladesh as having limited political rights, as indicated by Freedom House. The country is also perceived to have a low level of transformation and governance, in line with the findings of the Bertelsmann Foundation

Transformation Index. Additionally, Bangladesh receives a poor country rating, consistent with the Economist Intelligence Unit Country Ratings. The ratings suggest a high-country risk, which aligns with both the Global Insights Country Risk Ratings and the PRS International Country Risk Guide. Furthermore, the students perceive Bangladesh to have low levels of democracy, which corresponds with the results of the Varieties of Democracy Project. Finally, Bangladesh obtains a low score in the Corruption Perceptions Index, confirming the presence of corruption issues in the country.

These perceptions align with the rankings in international indexes, which also highlight Bangladesh's challenges in areas such as political rights, corruption, rule of law, and governance. The students' perceptions, as reflected in the questionnaires, seem to be consistent with the objective assessments made by international indexes, suggesting a correlation between the two.

Discussion and Conclusion

In this comprehensive research endeavor, the perceptions of university students in Bangladesh regarding the governance and justice landscape have been thoroughly examined. As this study concludes, the key findings are summarized, practical implications explored, limitations acknowledged, and directions for future research charted.

The analysis has uncovered a range of views among university students in Bangladesh. Predominantly pessimistic perceptions were observed concerning various facets of governance and justice, including the independence of the judiciary, protection of human rights, freedom of speech and press, the role of the ruling government in shaping the legal system, effectiveness of law enforcement agencies, addressing corruption, efficiency of the legal system, and accessibility of justice for marginalized communities. Conversely, positive sentiments were noted regarding the significance of an effective judiciary in attracting foreign investments, fostering economic growth, and the importance of public awareness and education about the legal system and the rule of law.

These findings align with previous studies. It was noted by Rabbani and Chowdhury (2014) that governance issues and ineffective policy implementation significantly impact higher education quality in Bangladesh. Similarly, it was emphasized by (Gu et al., 2020) that governance practices substantially contribute to justice outcomes. This study extends these findings by demonstrating that university students perceive these governance issues as directly impacting their trust in the judicial system, consistent with the theoretical framework proposed by Sabbagh (2007) and Akhayeva and Turgunbayeva (2023), which highlights the role of governance quality in shaping public perceptions.

Several gaps in the literature have been addressed by this research. While previous studies have focused on governance issues in higher education or the general public, this study specifically targets the perceptions of university students, providing insights into a well-educated demographic with a unique perspective on governance and justice. This research builds on existing theories by applying them to a new context and demographic, highlighting both the similarities and differences in perceptions between university students and other population segments.

The alignment observed between Bangladesh's poor rankings in international indexes and the negative perceptions expressed by students carries profound implications. It underscores the connection between objective assessments and subjective perspectives on political rights, civil liberties, corruption levels, rule of law, and overall risk. These findings establish a solid foundation for informed discussions and debates on these critical issues within the country. The consistency between students' perceptions and international rankings enhances the credibility and reliability of these assessments. This alignment reinforces the role of international indexes as dependable sources of information on governance, human rights, and corruption within Bangladesh. It highlights the vital importance of addressing identified challenges to improve the country's rankings and meet the expectations of its citizens and the

international community.

The results emphasize the imperative of ongoing efforts to enhance political rights, combat corruption, strengthen the rule of law, and improve governance in Bangladesh. The alignment between objective assessments and subjective perceptions provides a robust basis for meaningful discussions, comprehensive reforms, and targeted initiatives aimed at effectively addressing these challenges and fostering positive change. Subjectivity in rating interpretation, biases in self-reporting, and concerns about generalizability may have affected the validity of the study's results. Additionally, accounting for contextual factors and ensuring data integrity posed inherent challenges.

Future research endeavors should consider several avenues for investigation. Comparative analyses with students from other countries can provide cross-cultural perspectives on governance and justice. Engaging legal and governance experts, policymakers, and practitioners can offer deeper insights and potential solutions. Exploring regional variations within Bangladesh, conducting longitudinal studies, incorporating stakeholder perspectives, and utilizing qualitative research methods can contribute to a holistic understanding of the issues. Comparing subjective perceptions with objective indicators and evaluating existing policies and reforms are also promising areas for future research. These efforts can collectively advance evidence-based policymaking and drive improvements in governance and justice systems in Bangladesh.

In conclusion, this research serves as a steppingstone toward a more profound comprehension of Bangladesh's governance and justice landscape. It is hoped that the insights gained will catalyze meaningful change and progress for the nation. The study not only confirms the existing concerns highlighted in previous research but also expands the understanding of these issues through the lens of university students, offering a unique contribution to the literature.

Compliance with Ethical Standards

Ethical Approval

This article does not fall under the requirement for ethical committee approval as it focuses on non-behavioral and non-psychological aspects. A part of the study involved a survey of university students, all of whom were adults and participated voluntarily, providing informed written consent. Adhering to the Declaration of Helsinki 1964 (64th Amended, 2013), the research maintained high ethical standards, and the non-intrusive nature of the study negated the need for Institutional Review Board (IRB) approval.

Author Contributions
All authors contributed jointly to the design, data collection and analysis, interpretation of data and findings, drafting, critical review, final approval and accountability, and supervision processes. The concept and idea development were carried out by M.S.I and Y.A., while the literature review was conducted only by M.S.I. The review, validation, and finalization processes were handled by M.M.F.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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ORIGINAL RESEARCH

Estimating the Determinants of Consumers' Electric Vehicle Purchase Intentions: Empirical Evidence from Türkiye

Tüketicilerin Elektrikli Araç Satın Alma Niyetlerinin Belirleyicilerini Tahmin Etmek: Türkiye'den Ampirik Kanıtlar

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Abstract

In the present era, environmental concerns like air pollution, the decrease of natural resources (which has led to increased oil prices) and climate change have led to a shift in consumer preferences towards electric vehicles (EVs). The use of electric vehicles is regarded as an effective technology for reducing greenhouse gas emissions from road transportation using fossil fuels. Despite the recent influx of worldwide automotive brands into the Turkish market, the apportion of EV in the developing Turkish automobile market remains limited. It is crucial to identify the variables that influence consumers' intentions to purchase electric vehicles. The objective of this study is investigating the influence of environmental concern, environmental perception, social impact, performance and usage barriers on Turkish individuals' intentions to purchase EV. A survey was conducted online with 340 participants to test the research model and hypotheses derived from the literature. Once the data had been collected using the snowball sampling method, it was analyzed using the SPSS and SmartPLS software packages. The findings of the research indicate that consumers' environmental concerns and environmental perceptions have a significant effect on their purchasing intentions. On the other hand, while social influence and performance had a significant positive impact on the intention to purchase an EV, usage barriers did not have a significant impact.

Keywords: Electric Vehicles, Purchase Intention, Environmental Perception, Usage Barriers, Performance, Social Influence.

Öz

Günümüzde hava kirliliği, doğal kaynakların tükenmesi (petrol fiyatlarının artmasıyla sonuçlanan) ve iklim değişikliği gibi çevresel sorunlar, tüketiciler arasında elektrikli araçların tercih edilmesine yol açmıştır. Elektrikli araçlar, fosil yakıtların kullanıldığı karayolu taşımacılığından kaynaklanan sera gazı emisyonlarını azaltan etkili bir teknoloji olarak kabul edilmektedir. Türkiye'de son dönemde birçok küresel marka otomobil pazarına girmiş olsa da, elektrikli araçların gelişmekte olan Türk otomobil pazarındaki payı sınırlı kalmaktadır. Bu nedenle, tüketicilerin elektrikli araç satın alma niyetlerini etkileyen faktörlerin belirlenmesi önemlidir. Bu çalışmanın amacı, çevresel kaygı, çevresel algı, sosyal etki, performans ve kullanım engellerinin Türk tüketicilerin elektrikli araçlara yönelik satın alma niyetleri üzerindeki etkisini araştırmaktır. Araştırma modelini ve literatüre dayalı hipotezleri test etmek için 340 katılımcı ile çevrimiçi bir anket gerçekleştirilmiştir. Veriler kartopu örnekleme yöntemi ile toplandıktan sonra SPSS ve SmartPLS paket programları kullanılarak analiz edilmiştir. Araştırma bulguları, tüketicilerin çevresel kaygıları ile çevresel algılarının satın alma niyeti üzerinde önemli etkisi olduğunu doğrulamaktadır. Öte yandan elektrikli araç satın alma niyeti üzerinde sosyal etki ve performans anlamlı ve pozitif etkiye sahipken, kullanım engellerinin önemli bir etkisi olmadığı görülmüştür.

Anahtar Kelimeler: Elektrikli Araçlar, Satın Alma Niyeti, Çevresel Algı, Kullanım Engelleri, Performans, Sosyal Etki.

Estimating the Determinants of Consumers' Electric Vehicle Purchase Intentions: Empirical Evidence from Türkiye

Due to the increasing population and subsequent rise in production in the industrial and conveyance sectors, the consumption of natural gas and oil has reached its peak level. The combustion of fossil fuels, such as coal, oil, and natural gas, to fuel vehicles and machinery has significantly increased CO2 emissions, also known as greenhouse gas (GHG) emissions (Abbasi et al., 2021). In terms of the International Energy Agency (IEA), the majority of GHG emissions in the Turkish energy market are attributable to the use of petroleum-based petrol and diesel motor vehicles. Furthermore, the transport sector, including road transport, was identified as the second most significant source of GHG emissions, accounting for 22.3%. Turkey ranked thirteenth globally and second in Europe for GHG emissions resulting from fossil fuel energy production (International Energy Agency, 2022). On the other hand, based on Anadolu Agency (AA) data, the Turkish automotive market (including cars and light commercial vehicles) grew by approximately 60% in 2023 compared to the previous year, with a significant portion of the market being comprised of vehicles with internal combustion engines. This growth rate is noteworthy, especially considering the chip supply shortage and high inflation environment in the post-Covid period (Durdak, 2024). The figures demonstrate that the transport sector, particularly road transport, has a negative impact on the environment, contributing to issues like air pollution, climate change and global warming (Lee et al., 2021; Lin et al., 2017). The widespread use of electric vehicles, characterized as sustainable cars, may be beneficial in reducing GHG emissions, a common source of environmental problems not only in Turkey but also in all countries of the world (Hofmann et al., 2016; Krishnan & Sreekumar, 2023).

Turkey has the potential to become a significant player in the electric vehicle market due to its high car sales volume, significant contribution to GHG emissions, and dependence on imported oil. Many global brands have recognized this potential and actively promote their products in the country. According to the Automotive Distributors and Mobility Association (ODMD), EV sales raised by 844% in proportion to the previous year in 2023. Despite the striking rate, electric vehicles only account for 7.5% of total car sales in Turkey in 2023. Hybrid vehicles have a share of 10.8% (Durdak, 2024). Due to infrastructure problems, limited government support, a general rise in electricity prices (Güven, 1999), doubts about performance, and other negative factors (Ninh, 2021), the low rate of electric vehicle use is a predictable situation. In this context, it is important to examine the factors that impact consumers' electric vehicle purchasing behavior to develop strategies that increase the market apportion of electric vehicles. However, few studies center on the barriers to the use of EV in the developing Turkish market and the factors that contribute to their widespread use (Kocagöz & İğde, 2022; Yaprak et al., 2024; Efendioğlu, 2024). The present research has been motivated by these factors and highlights the need for further investigation. This study provides insights that will aid in the wider adoption of EV.

The Turkish government has presented a grant program to support the use of EV. This initiative involves the installation of charging stations and a decrease in special consumption tax (SCT) based on engine power and sales price. However, despite these efforts, the acceptance EVs remains low. This suggests that factors beyond government policies may be of significant influence on the decision to purchasing an EV. The study predicts that consumers' purchase intentions may be influenced by several factors, including concern about environmental damage caused by fossil-fuelled vehicles, the perception that electric vehicles are environmentally friendly, the performance of electric vehicles, other people's opinions about electric vehicles, and technical barriers to their use. The study proposes a model that considers factors affecting the intention to purchase an EV, such as environmental concern, environmental perception, performance, social impact, and usage barriers.

The study is structured as follows: Following the introduction, the conceptual framework is introduced,

followed by a literature look at the hypotheses developed in line with the research model. The method section includes details about the scale creation, data collection, and presentation of information about the sample. Information about the methods used in data analysis is then provided, and the findings of the analysis are summarized. In conclusion, the research findings are associated with those of previous studies in literature. Recommendations are made for manufacturers and government officials to develop effective strategies for the widespread use of EVs. The study reasoned out research limitations and recommendations for future research.

Conceptual Framework and Hypothesis Development

Electric Vehicles (EVs)

The use of fossil fuels in industrial and automotive sectors has been connected to increased air pollution and serious health issues, including cancer. Additionally, the transportation sector devours nearly half of the world's oil supply. Given the current rate of consumption, it is predicted that this non-renewable resource will be depleted by 2038 (Ding et al., 2017, p. 50). The necessity to address these issues has prompted automotive manufacturers to develop their technologies accordingly. Electric vehicle technologies are a crucial aspect of the development process. Currently, the automotive industry invests a significant portion of its research and development budget towards creating engine technology that is environmentally friendly and reduces reliance on fossil fuels (Veza et al., 2023). The latest technology has led to the development of five categories of EVs: battery electric vehicles (BEV), plug-in hybrid electric vehicles (PHEV), hybrid electric vehicles (HEV), fuel cell electric vehicles (FCEV), and extended-range electric vehicles (ER-EV) (Sanguesav et al., 2021, p. 376). BEVs operate solely on electric power, while PHEVs are powered by both an internal combustion engine and an externally stored electric motor. HEVs generate electricity internally using an electric motor instead of storing it externally. The electric motor is powered by the vehicle battery, while the internal combustion engine recharges the battery. FCEVs are vehicles that use an electric motor powered by compressed oxygen and hydrogen. This technology produces zero emissions, reducing air pollution. However, it does increase the consumption of natural resources as natural gas is used to produce hydrogen. ER-EVs, then again, have an internal combustion engine that generates energy for the battery. Unlike the other types of vehicles mentioned, this engine is not powered by the wheels of the vehicle and is used solely for charging purposes (Sanguesav et al., 2021, p. 377).

Despite recent developments in the electric vehicle industry, their use remains limited worldwide due to concerns about technical features such as limited driving range (Miwa et al., 2017), recharge time (Hardman et al., 2016), battery durability (Junquera et al., 2016), maximum speed, and performance (Lee et al., 2021). Furthermore, economic factors such as price (Zhuge & Shao, 2019) and long-term monetary benefits (Lashari et al., 2021), as well as infrastructure problems such as limited charging stations (Habich-Sobiegalla et al., 2018), play a decisive role in consumer purchasing decisions. Overcoming technological deficiencies and addressing consumer concerns are key to expanding the EV market. A recent literature review has identified numerous factors that directly impact consumers' intentions to purchase electric vehicles (Ivanova & Moreira, 2023, p. 8). The literature review categories the ascendants of EV purchase intention into three main categories, each with three sub-categories, resulting in a total of nine sub-categories. Based on this literature review, the current study considers five determinants, namely environmental concern, environmental perception, social impact, usage barriers, and performance, which are considered to impact Turkish consumers' EV purchase intentions. The literature review on the hypotheses developed in line with these determinants is presented in the following section.

Environmental Concerns

Environmental concern refers to the consciousness of environmental problems and the advocacy of solutions to these problems. It involves a willingness to seek solutions to these problems personally (Dunlap & Jones, 2002, p. 485). As an individual belief, environmental concern can guide consumers' decisions to purchase sustainable products (Dutta & Hwang, 2021, p. 4). Jensen et al. (2013) conducted a research supporting the idea that consumers with high environmental concern prefer electric vehicles. The study found that consumers' electric vehicle preferences were positively influenced by environmental concern both before and after a three-month test drive experience. Additionally, a study conducted in the densely populated Macau region of China confirmed that environmental concern is a key factor motivating consumer interest in EVs (Lai et al., 2015). Another study conducted with the example of Pakistan revealed that environmental concerns have a significant effect on the intention to purchase EVs. Additionally, consumers with high environmental concerns have been reported to be more likely to purchase EVs (Lee et al., 2021). Growing environmental concern encourages individuals to take greater responsibility for protecting the environment, and this has a significant effect on their decision to purchase EV (Cui et al., 2021). Habich-Sobiegalla (2018) and colleagues conducted an international comprehensive study on Brazilian, Chinese, and Russian citizens to provide sustainable solutions for transportation. The research established that environmental concern strongly influenced the intention to purchase EVs in all three countries, with the highest impact observed among Brazilian citizens. Wu et al. (2019) examined the factors that affect the acceptance of autonomous EVs (driverless and robotic), within the framework of the technology acceptance model. The research found that high levels of environmental awareness encourage consumers' behavioral intentions. However, a study conducted in Hong Kong found results that contradict the earlier studies. The intention to purchase EV was not determined by environmental concerns (Ng et al., 2018). Many subsequent studies have reached similar conclusions (Ackaah et al., 2022; Ninh, 2021). The discrepancy in the literature can be defined by the fact that environmental concern is a psychological factor that may vary different cultural structures. In this context, the following hypothesis is proposed to understand more clearly whether Turkish consumers' environmental concerns determine their intention to purchase EVs.

H1: Environmental concern positively influences consumers' intention to purchase EV.

Environmental Perception

In the scope of this study, the concept of environmental perception reflects the benefits of EVs for environmental guardianship. Benefit expectation is a significant factor affecting purchase intention (Wang, 2017). Several studies have emphasized that electric vehicle use reduces the effects of climate change, carbon footprint, and natural resource consumption, and that environmental protective behavior is linked to the expectation of environmental benefits (He et al., 2018; Jansson et al., 2010). Consistent with He et al. (2018), environmental perception is consumers' appreciation of the positive environmental consequences of using EVs. Electric vehicles have two main environmental benefits: energy saving and environmentally friendly features. Environmental perception reflects awareness of these benefits (Xu et al. 2019). Electric vehicles contribute more to the efficient use of energy than internal combustion engine vehicles. Especially when electricity is developed with renewable energy resources, these vehicles offer more environmental benefits than vehicles that use petroleum-based fuel (Zhang et al., 2022). On the authority of Zhang et al. (2018), today consumers are aware of the environmental advantages of EVs. This awareness may lead to positive attitudes towards the use of EVs. Another study of German consumers found that the environmental performance of electric vehicles had a stronger effect on attitudes and purchase intentions than price value and line up assurance (Degirmenci & Breitner, 2017). Thus, the following hypothesis was proposed.

H2: Environmental perception positively affects consumers' intention to purchase EV.

Social Influence

Fishbein and Ajzen, in the Theory of Reasoned Action (TRA), it has been suggested that the intention to purchase may be affected by the social influence or pressure of other people. The authors initially explained this effect using the concept of subjective norm, which mentions a person's appreciation of whether important people in their life think he/she should or should not engage in a particular behavior (Fishbein & Ajzen, 1975, p. 302). Subsequently, Venkatesh et al. (2003, p. 405) determined as social influence as the extent to which an individual believes that significant people life expect them to use the new technology. Cui et al. (2021) emphasized the emphasis of peer recommendations in individuals' purchasing decisions, citing the need for affiliation in Maslow's Hierarchy of Needs in their research. They also found that social influence plays a crucial role in motivating people to buy electric vehicles. All these studies show that social influence occurs when an individual's behavior is influenced by others (Lin & Wu, 2018, p. 234). A study conducted in India found that the perspectives of people in the participants' communication networks had a positive effect on their intention to purchase EVs (Krishnan & Koshy, 2021). The opinions of various reference groups, such as family members, neighbors, peers, or friends, have the power to change an individual's opinion about purchasing an EV (Zhang et al., 2011). The study on Taiwanese consumers supports this view. According to the study, potential consumers are highly influenced by the opinions of their close friends who have already purchased electric vehicles and are satisfied with them (Dutta & Hwang, 2021). A study carried out in Beijing, the capital of the People's Republic of China, revealed that 64 percent of vehicle owners are considering buying an EV. This is due to the positive evaluations of electric vehicle users, including their relatives and friends (Yang & Tan, 2019, p. 14). Kim et al. (2014), marketing strategies prepared according to the details of social impacts can accelerate the positive change in attitudes and therefore intentions towards electric cars. However, some studies in the literature suggest that social influence may not importantly impact the intention to purchase EVs (Lashari et al., 2021; Lee et al., 2021). These conflicting results point out that the impact of social influence on EV purchase intention may vary depending on the study sample or country (Nosi et al., 2017). Therefore, the following hypothesis is proposed to understand the influence of social influence on the purchasing intentions of Turkish consumers for electric vehicles.

H3: Social influence positively influences consumers' intention to purchase EV.

Usage Barriers

Numerous international studies have examined the challenges to the widespread adoption of EVs in various countries. For example, Vassileva and Campillo (2017), Tarei et al. (2021), and Asadi et al. (2022) have conducted research on this topic. Adhikari et al. (2020) have investigated the obstructions of electric vehicle use in Nepal using multi-criteria decision-making methods. The research findings indicate that infrastructure barriers were the most significant, followed by political, economic, technical, and social barriers, respectively. Additionally, the weights of all categories, except for social barriers, were similar, highlighting the importance of these three categories in the use of electric vehicles. After analyzing the categorical barriers in detail, it was found that the most significant infrastructure barrier was the lack of charging stations, followed by the deficiency of reparation and upkeep services. The most significant technical barriers were limited range and battery life, respectively. Krishnan and Koshy's (2021) study on Indian consumers' electric vehicle adoption behavior found that concerns such as battery life, duration, and cost had a negative impact on purchase intention. Haustein et al. (2021) carried out a multinational research as part of an EU project and discovered that new fast charging stations had a positive effect on the intention to purchase EVs in Denmark. However, this effect was not observed in the Swedish context. The authors attribute this result to Sweden's more advanced

electric vehicle infrastructure investments compared to Denmark. A recent literature review categorized the factors preventing Indian consumers from adopting electric vehicles into thirteen categories. The study identified the deficiency of a uniform charging infrastructure, recharging time, and driving range as the three most important barriers (Patyal et al., 2021). On the other hand, while pre-sales and after-sales services play a significant role in the electric vehicle purchase intentions of Italian millennial consumers, the opposite of what was expected in terms of perceived barriers was realized (Nosi et al., 2017). Other studies in the literature have also found that obstacles such as driving range (Shareeda et al., 2021), battery life (Habich-Sobiegalla et al., 2018), and charging time (Miwa et al., 2017) do not affect purchase intention. This research proposes the following hypothesis to determine how these barriers influence the intention of Turkish consumers to purchase EVs, taking into account that barriers to use may vary by geographic location.

H4: Usage barriers negatively influence consumers' intention to purchase EV.
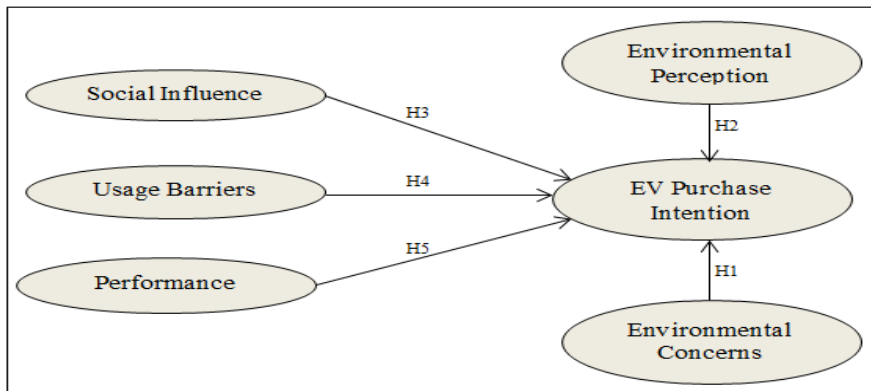
Performance

Performance is defined as the belief of consumers that electric vehicle engines are technically competitive with internal combustion engines (Krishnan & Sreekumar, 2023, p. 165). Krishnan and Sreekumar (2023) also stated that electric vehicles with comparable performance characteristics to conventional vehicles, such as speed, power, acceleration, and torque, are more likely to be adopted. The competitive performance characteristics of EVs can be a powerful strategy even for consumers who do not prioritize environmental friendliness (Kang & Park, 2011). Furthermore, the greater the relative advantage of EVs associates to conventional vehicles, the higher the likelihood of consumer adoption. Therefore, it is possible to positively influence the intention to adopt EVs through driving experiences that allow for the evaluation of performance characteristics (Xu et al., 2020). Lee et al. (2021) reported that performance expectancy has a positive impact on behavioral intentions to purchase EVs. Abbasi et al. (2021) reported results that contradicted the study findings of Lee et al. (2021). In a study carried out a sample of individuals with knowledge and experience in technological products, the participants stated that they would be more likely to adopt EVs if they sense them to be superior in performance associated with customary vehicles (Egbue & Long, 2012). According to a study on hybrid vehicle technology, factors such as quiet operation, environmental friendliness, quality, efficiency, automatic transmission, and ease of driving play a significant role in the adoption of these vehicles (Ozaki & Sevastyanova, 2011). A similar study conducted in Beijing, it was reported that electric vehicle product features are among the main factors affecting purchase intention (Huang & Ge, 2019). Another study defined the quality of electric vehicles as a performance value for consumers. The study revealed that performance value has a positive impact on attitude and adoption intention (Han et al., 2017). According to Tu and Yang (2019), vehicle performance is one of the main factors affecting the intention to purchase an EV. On the other hand, according to Dutta & Hwang's (2021) research, vehicle performance did not affect attitude, which is the main determinant of behavioral intention, among participants in Thailand. The researchers explained this by saying that participants generally purchased electric vehicles for daily use and were not concerned about vehicle performance for short distance drives. Another study conducted in four major Chinese cities has reached similar conclusions. According to the results, the average score for the vehicle performance statements was close to three. This suggests that respondents believe that electric vehicles do not have a clear advantage over internal combustion engine vehicles (Lin & Wu, 2018). This research proposes the following hypothesis that the performance of EVs is a factor in purchase intention for Turkish consumers, as reported in many other studies with positive results.

H5: Performance positively influences consumers' intention to purchase EV.

The research model and hypothesis paths based on the above discussions are presented in Figure 1.

Figure 1

Research Model

The following part shows details of the survey application used to test the effect of environmental concern, environmental perception, social influence, usage barriers and performance variables on electric vehicle purchase intention.

Data and Methodology

Measurements

Scales validated in previous studies were utilized to test the hypothesis pathways, as shown in Figure 1. Environmental concern was assessed with a five-item scale including the context of "concern about air and environmental pollution from exhaust emissions" and adapted from Lee et al. (2021). The environmental perception was menstruated by getting participants' degree of agreement with five expressions meaning that "the use of electric vehicles reduces environmental damages" and was adapted from He et al. (2018). Social influence was measured by four statements that identified "the level of influence of family and peers on electric vehicles" and adapted from Abbasi et al. (2021). Usage barriers were measured with five statements contextualizing 'concerns about range, charging and servicing'. Three of the statements were adapted from Krishnan and Sreekumar, (2023) and two from Abbasi et al., (2021). Performance was tested with a three-point scale that includes "the competitive qualities of electric vehicles with conventional vehicles". The statements were selected from Krishnan and Sreekumar (2023) and Xu et al. (2020). Finally, five statements from Ninh (2021) were used to measure purchase intention in the context of "I plan to purchase an EV if conditions are favorable". The final survey, consisting of 27 statements, was evaluated using a 5-option Likert scale from 1 to 5 (strongly disagree....strongly agree). The questionnaire was separated two part. The first section included sociodemographic details, like gender, age, education, occupation, income, EV driving experience, and car ownership. The second part consisted of statements related to the determinants of EV purchase intention. Prior to conducting absolute analyses, pre-research was conducted pre-test the data. The researcher personally identified individuals with knowledge about electric vehicles and forwarded them the URL of a questionnaire prepared through Google Forms. The purpose was to obtain feedback on the clarity and suitability of the questions for the research. Based on the feedback transmitted, some questions were rephrased. The pilot study yielded a Cronbach's alpha above 0.70 based on 48 responses. The explanatory factor analysis, conducted using the SPSS, grouped statements with a factor load of 0.50 and above according to their respective factors.

Data Collection and Sampling

Turkey has a small but growing market share in the electric car category (Durdak, 2024). Furthermore, the increasing air pollution throughout the country, especially in the Marmara region has led to a rise in awareness about electric vehicles (IEA, 2022). This study is a cross-sectional research using quantitative research techniques. To examine the purchase intentions of Turkish consumers for electric vehicles, a nationwide online survey was conducted from 10-26 March 2024. In order to reach potential participants, it was determined that the exponential non-discriminative snowball sampling method was an appropriate approach. This method is one of the non-probability sampling methods (Etikan et al., 2015). The participants are individuals who know about electric vehicles. To achieve objectivity, the researcher contacted individuals believed to have information on the subject via WhatsApp. The initial contact group was then asked to reach out to others who had information on electric vehicles using the same method. This process was continued until the sufficient sample size was reached. A total of 340 surveys were obtained, taking into account 5% sampling error and 95% confidence level. Table 1 displays the demographic qualities of the participants.

Table 1

Demographic Gualities of the Research Participants

Measure	Item	Count	(%)
Gender	Female	157	46.2
	Male	183	53.8
Age	18-29	77	22.6
	30-39	145	42.6
	40-49	84	24.7
	≥50	34	10.0
Education	High school and below	26	7.6
	Associate degree	22	6.5
	Bachelor's degree	167	49.1
	Master's degree	76	22.4
	Ph.D. degree	49	14.4
Monthly Income (As of March 2024, 1₺ is approximately equal to 0.031 USD.)	≤17.000 ₺	32	9.4
	17.001 ₺ -27.000 ₺	43	12.6
	27.001 ₺ -37.000 ₺	40	11.8
	37.001 ₺ -47.000 ₺	63	18.5
	≥47.001 ₺	162	47.6
Occupation	Government employee	181	53.2
	Private employee	89	26.2
	Self-employed	24	7.1
	Retired	7	2.1
	Unemployed	39	11.5
Car Ownership	No car	91	26.8
	1 car	190	55.9
	2 cars and more	59	17.4
Electric Vehicle Driving Experience	Yes	81	23.8
	No	259	76.2

The gender distribution of the participants was balanced, with 53.8% male and 46.2% female, in line with the address-based population registration system (TÜİK, 2023). Analysis of the age distribution shows that 67.3% of participants are aged between 30-49, with 10.0% aged 50 or older. Regarding

education, 85.9% of the participants hold a bachelor's degree or higher, while 6.5% have an associate's degree. The remaining 7.6% have a high school education or less. The proportion of participants with an income above ₺37,000 was 66.1%. Upon analyzing the occupations of the participants, it was found that the majority (79.4%) are employed in the government and private sectors. The percentage of individuals who own at least one car is significantly higher (73.3%) compared to those who do not (23.8%). Furthermore, only a minority of respondents (24.4%) reported prior experience with electric vehicles.

Data Analysis and Findings

The collected data was analyzed using SPSS and SmartPLS software. Firstly, the reliability of the main scale with 27 statements and the sub-dimensions in the scale were tested via SPSS. The Cronbach's Alpha value of the main scale was found to be 0.926, while the Cronbach's Alpha values of the sub-dimensions were between 0.775 and 0.946. All values exceeded the recommended values (Hair et al., 2009), indicating high reliability of the scale. Following the reliability analysis, we conducted an exploratory factor analysis using the principal axis factorization and varimax rotation method to determine if the statements in the scale were collected under the structures verified in the literature. The analysis yielded a KMO value of 0.924 and a Chi-Square value of 6551.026 (sd: 351 sig. < 0.001) as a result of Bartlett's test. All statements had factor loadings greater than 0.50. Additionally, all statements were categorized according to their related constructs. Finally, six constructs with eigenvalues greater than 1 were identified, explaining a total variance of 72%. These results demonstrate that the sample size is adequate and that the relationships between the constructs and their sub-expressions are significant (Krishnan & Koshy, 2021). In other words, the results confirm that the dataset is suitable for confirmatory factor analysis and PLS-SEM.

Measurement Model

To test the measurement model, confirmatory factor analysis was conducted using the SmartPLS program. In the analyses, the construct reliability and validity (convergent and discriminant validity) of the measurement model were evaluated with a bootstrapping sample of 5000 people. However, prior to conducting the analysis, it is necessary to examine the nature of the structures in the model in order to determine the most appropriate methodology for the basic analysis. Given that all structures in the model reflect the contents of the sub-expressions (Juliandi, 2018, p. 3), the model was determined to be reflective. Consequently, the measurement and structural models were analyzed using consistent PLS-SEM (Dash & Paul, 2021). In the process of evaluating the measurement model, the factor loadings of the sub-expressions of the structures were initially examined. Hair et al. (2017, p. 137) propose that statements with factor loadings below 0.40 should be removed from the scale. On the other hand, expressions with factor loadings between 0.40 and 0.70 should remain in the scale if they meet the conditions of average variance extracted (AVE)>0.50 and composite reliability (CR)>0.70. Table 2 reveals that the factor loadings of the expressions EC4 (0.586), SI1 (0.697), UB1 (0.633) and UB2 (0.617) fall within the range of 0.40-0.70. Upon examination of the AVE and CR values presented in Table 2, it can be seen that the relevant expressions were retained within the scale, as they exhibited values above the desired threshold. The internal consistency of the data was evaluated by examining Cronbach's Alpha and CR values. The Cronbach's Alpha values of the constructs were found to be in the range of 0.775-0.947, while the CR values were in the range of 0.853-0.960 (see Table 2). It was observed that the AVE values were above the reference value of 0.50. In accordance with the criteria set forth by Fornell & Larcker (1981) and Hair et al. (2017), it can be stated that the measurement model meets the internal consistency and convergent validity criteria.

Table 2

Assessment of Measurement Model

Construct	Sub-Expressions*	Factor Load	Cronbach Alpha	rho_A	CR	AVE
Environmental Concerns	EC1	0.769	0.834	0.903	0.879	0.596
	EC2	0.818				
	EC3	0.820				
	EC4	0.586				
	EC5	0.838				
Environmental Perception	EP1	0.943	0.947	0.959	0.960	0.828
	EP2	0.917				
	EP3	0.950				
	EP4	0.953				
	EP5	0.775				
Social Influence	SI1	0.697	0.775	0.811	0.853	0.594
	SI2	0.836				
	SI3	0.777				
	SI4	0.776				
Usage Barriers	UB1	0.633	0.853	0.744	0.860	0.557
	UB2	0.617				
	UB3	0.712				
	UB4	0.855				
	UB5	0.876				
Performance	P1	0.843	0.779	0.788	0.869	0.690
	P2	0.849				
	P3	0.798				
EV Purchase Intention	PI1	0.905	0.919	0.922	0.939	0.757
	PI2	0.900				
	PI3	0.897				
	PI4	0.849				
	PI5	0.793				

Note: *t* values of all expressions>2.32 and p<0.001

Table 3 presents the results regarding discriminant validity. A substantial body of literature examines the concept of discriminant validity using the Fornell & Larcker (1981) method and Henseler et al. (2015) HTMT values. In accordance with the Fornell & Larcker method, the black root of AVE must be greater than the correlation between structures. The HTMT values proposed by Henseler et al. (2015) were found to be above 0.90 in the measurement model containing similar structures. Conversely, in the measurement model containing different structures, it is expected that the HTMT values will be below 0.80. In Table 3, values in bold indicate the square root of AVE, values in parentheses indicate correlation coefficients, and italicized values indicate HTMT values. Upon examination of Table 3, it can be seen that the measurement model meets the reference values and has discriminant validity. Finally, the VIF coefficients of the constructs were examined, and it was found that they ranged from 1.05 to 2.81. Hair et al. (2019, p. 10) state that VIF values below 5 indicate that multi-collinearity is not a concern in model.

Table 3

Fornell & Larcker Method and HTMT Values

Construct	Environmental Concerns	Environmental Perception	Social Influence	Usage Barriers	Performance	EV Purchase Intention
Environmental Concerns	**0.772**					
Environmental Perception	*0.838* (0.770)	**0,910**				
Social Influence	*0.567* (0.480)	*0.576* (0.504)	**0.771**			
Usage Barriers	*0.167* (0.082)	*0.037* (0.008)	*0.129* (0.026)	**0.747**		
Performance	*0.592* (0.493)	*0.573* (0.521)	*0.740* (0.577)	*0.248* (0.154)	**0.830**	
EV Purchase Intention	*0.639* (0.610)	*0.701* (0.658)	*0.599* (0.523)	*0.085* (-0.049)	*0.564* (0.491)	**0.870**

Following the validation of the measurement model, a series of detailed analyses were conducted using the SmartPLS program to test the significance of the hypothesis paths within the research model. The results of these analyses are presented in the subsequent section.

Structural Model

The results of the structural model testing the research hypotheses are presented in Figure 2. The hypothesized paths were evaluated in the PLS-SEM algorithm with a significance level of 5% and 5000 bootstraps. Figure 2 presents the standardized path coefficients of the hypothesized paths, their respective significance levels (shown in parentheses), and the explained variance of the dependent variable (R^2). Upon examination of Figure 2, it becomes evident that the R^2 value of the dependent variable (EV purchase intention) is 0.51. The R^2 value, which reflects the total variance explained, indicates that 51% of the independent variables predict EV purchase intention. Consistent with Hair et al. (2011:147), R^2 values above 0.50 are considered important in evaluating the quality of the tested model. The PLSPredict analysis yielded a Q^2 value of 0.36. Q^2 value of 0.35 or above is indicative of a high degree of predictive ability (Hair et al., 2014). In order to ascertain the proportion of independent variables in the R^2 percentage of the dependent variable, Cohen's (1988) effect size coefficient, f^2 values, were examined. The evaluation conducted in accordance with the reference ranges established by Cohen (1988) revealed that all of the independent variables exhibited a relatively weak influence on EV purchasing intention, with f^2 values ranging from 0.030 to 0.089.

The hypothesized paths can be tested following satisfactory results of the structural model. Upon evaluation of the significance of the research hypotheses, it is observed that all hypotheses, with the exception of H4, positively influence the EV purchasing intention (Figure 2). Among the independent variables, the environmental perception variable was found to significantly affect the EV purchasing intention (β= 0.350, p<0.001). This indicates that the H2 hypothesis is supported, and that environmentally friendly features of electric vehicles are a significant factor in Turkish consumers' intention to purchase EVs. Consistent with the H2 hypothesis, the path from the environmental concern variable to EV purchase intention was found to be significant (β= 0.197, p<0.01). This indicates that hypothesis H1 is accepted, and individuals with environmental concerns have a higher intention to purchase EVs.

Figure 2

Path Diagram
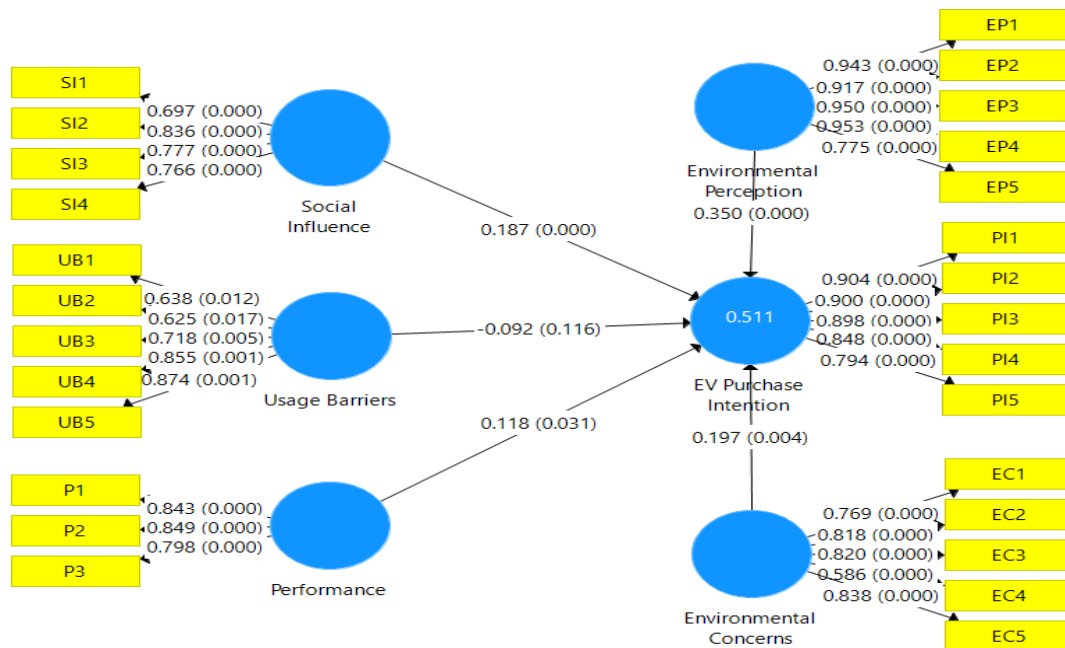
The path from the social impact variable to EV purchase intention had a significant coefficient (β= 0.187, p<0.001). The findings indicate that the opinions of family and friends regarding electric vehicles have a positive impact on the intention to purchase an electric vehicle. Consequently, the H3 hypothesis was accepted. The performance of electric vehicles was found to have a positive effect on purchase intention (β= 0.118, p<0.05). The fact that electric vehicles have a performance that can compete with traditional vehicles demonstrates that individuals have increased purchasing possibilities. Conversely, while it was anticipated that usage barriers would have a negative impact on the intention to purchase EVs, the results were not statistically significant for this study (β= -0.092, p>0.05). Consequently, the H4 hypothesis was not corroborated. A mere 24% of the participants had prior experience with electric vehicles. Therefore, general opinions regarding usage barriers may not play a decisive role in purchase intentions.

Discussion and Implications

The objective of this research was to identify the factors influencing individuals' intention to purchase EVs in an emerging market. The findings of the research indicate that Turkish consumers are concerned about the environment and that the environmentally friendly features of electric vehicles influence their motivation for purchasing vehicles. This finding is consistent with the results of a study on Pakistani consumers struggling with air pollution (Lee et al., 2021). The findings of the current study, which supports previous research investigating the factors influencing EV purchase intention, indicate that both environmental concern (Abbasi et al., 2021; Habich-Sobiegalla et al., 2018; Haustein et al., 2021; Lin & Wu, 2018) and environmental perception (He et al., 2018; Jansson et al., 2010) have a positive effect on EV purchase intention. The environmentally protective features of EV, including the reduction of climate change, carbon footprint, environmental pollution, and natural resource consumption, have been identified as key motivators for consumers in their purchasing decisions (Xu et al., 2019). In this context, marketing approaches that emphasize the positive impact of EVs on environmental protection and resource conservation may have a positive effect on Turkish consumers' EV purchases.

A further research finding indicates that individuals' EV purchasing intentions are influenced by close reference groups, such as family and friends. This finding supports the study of Dutta and Hwang (2021), which emphasized that social pressure from other individuals in close proximity to consumers can alter consumers' purchasing intentions in favor of sustainable EVs. A further study indicated that the perspectives of people in an individual's communication network can significantly influence his/her behaviour and tool choices (Krishnan & Koshy, 2021). A three-country comparative study, in line with the current research, has determined that personal dialogues and having a relative (such as a peer or family member) who owns an electric vehicle is a significant factor in the decision to purchase (Habich-Sobiegalla et al., 2018). In Turkey, where the influence of the group on the individual is pervasive, it can be reasonably asserted that the actions and behaviors of consumers are shaped by the opinions of individuals with whom they are closely associated. Consequently, in the Turkish market, EV manufacturers and marketing managers can facilitate greater knowledge and awareness of EVs by promoting their vehicles in public places such as shopping malls and offering complimentary test drives. Furthermore, the implementation of marketing strategies that encompass not only individual users but also the audience in the immediate vicinity of potential customers can enhance the impact of social influence on intention. It may be beneficial to leverage the marketing potential of social media platforms, such as YouTube, Instagram, and X, which are instrumental in the digital age.

Existing research has revealed that electric vehicles' performance features that compete with conventional vehicles positively influence EV purchase intention. The study, which was conducted in four major Chinese cities, found that the performance of electric vehicles (EVs) had a positive effect on the desire to purchase them. Furthermore, the study revealed that EVs perform as well as fossil fuel vehicles (Lin & Wu, 2018). Zhang et al. (2018) found in their study that consumers who prioritize the performance of electric vehicles (EVs) are more likely to purchase EVs. Another study showed that vehicle performance is an important factor in influencing consumer purchasing decisions. They therefore encouraged EV manufacturers to invest more in research and development to make their products more affordable, faster and more powerful than conventional vehicles (Krishnan & Koshy, 2021). In accordance with the findings of Krishnan and Sreekumar (2023), it can be posited that consumers who perceive EVs to be highly performing are more likely to purchase them. Consequently, informative advertisements and test drives may be an effective means of dispelling the public's doubts about performance.

The results of this study indicate that the perceived barriers to the use of EVs do not significantly affect EV purchase intention. This finding differs from previous studies that have suggested that limited driving range (Miwa et al., 2017), insufficient charging stations (Habich-Sobiegalla et al., 2018), recharging time (Junquera et al., 2016), and improvements in after-sales repair and service (Krishnan & Koshy, 2021) have a positive impact on EV purchasing intention. However, it is consistent with the results of the study (Nosi et al., 2017), which suggests that the usage barriers related to EVs do not affect the decision-making period of the Y generation. Similarly, Shareeda et al. (2021) also reported that driving range did not have a significant impact on consumers' willingness to purchase EV in Bahrain. The limited share of electric vehicles in the Turkish market and lack of knowledge about obstacles may have made it difficult for participants to make evaluations regarding their use. In this context, joint marketing initiatives can be established with individuals who are regarded as opinion leaders (such as influencers, celebrities, and experts) with the objective of reducing public prejudice and uncertainty surrounding electric vehicles.

This study answers the call of Lashari et al. (2021) that collecting data from consumer audiences in different countries will help complete the big picture of EV purchasing intention. It also provides clues to help develop potential strategies that can be used to reduce the effects of climate change within the

framework of the 2030 Sustainable Development Goals. Understanding the factors that influence consumers' decisions to purchase EVs can inform strategies to enhance the market potential of sustainable vehicles. In addition to the theoretical and practical contributions, this research also has some limitations. The fact that the sample included only Turkish consumers renders the results less generalizable. The research findings are constrained by the information provided in the survey form. Future research could employ a combination of quantitative/qualitative techniques to gain a more comprehensive understanding of the subject matter. In their compilation study on consumers, Ivanova and Moreira (2023) determined that numerous variables are effective in different cultures. In order to achieve more effective results and interpretations in developing markets, models incorporating additional variables, such as price and trust perception, economic and savings benefits, can be developed.

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ORIGINAL RESEARCH

China's Ambition to Balance Power within the Framework of Soft and Normative Power Concepts

Çin'in Yumuşak ve Normatif Güç Kavramları Çerçevesinde Güç Dengeleme Tutkusu

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Abstract

There are various power-balancing strategies have been examined in the field of International Relations and Political Science scholarship. While Western powers generally tend to use hard power or hard balancing strategies, China distinguishes itself from them by often seeking power balancing through soft and normative power. Since the founding of the People's Republic of China, the country has pursued a peaceful policy in its international affairs. Although China has recently adopted a more proactive foreign policy in parallel with its increasing political and economic influence in global politics and its tense relations with Taiwan, Hong Kong, and neighbouring countries, it has not moved away from its traditional peaceful foreign policy. Accordingly, China has focused on goals such as maintaining its Non-interference policies, realizing the Chinese Dream through the Belt and Road Initiative (BRI), and establishing Confucius Institutes to increase its normative and soft power influence in the international arena. This study aims to analyse China's power balancing strategies through soft and normative power strategies, in the context of China's current rising power position in the international arena.

Keywords: Power Balancing, Soft Power, Normative Power, Theories of International Relation, China.

Öz

Uluslararası İlişkiler ve Siyaset Bilimi alanlarında araştırma konusu olmuş farklı güç dengeleme stratejileri mevcuttur. Batılı güçler genellikle sert güç veya sert dengeleme stratejilerini kullanma eğilimi gösterme gayretindeyken, Çin genellikle yumuşak ve normatif güç kullanma yoluyla, kendisini güç dengeleme stratejisi bağlamında farklılaştırmaya çalışmaktadır. Çin Halk Cumhuriyeti, kuruluşundan bu yana, dış ilişkilerinde barışçıl bir dış politika izlemeye çalışmıştır. Çin, küresel politikada artan siyasi ve ekonomik nüfuzuna ve Tayvan, Hong Kong ve diğer komşu ülkelerle olan gergin ilişkilerine paralel olarak, son zamanlarda daha proaktif bir dış politika benimseme gayreti içerisinde olsa da geleneksel ve barışçıl dış politikasından uzaklaşmamıştır. Buna göre Çin, başka ülkelerin iç işlerine karışmamak anlamına gelen müdahale etmeme politikasını sürdürmek, Kuşak ve Yol Girişimi aracılığıyla Çin Rüyasını gerçekleştirmek, uluslararası alanda normatif ve yumuşak güç etkisini artırmak için Konfüçyüs Enstitüleri kurmak gibi farklı hedefler üzerinde yoğunlaşmış durumdadır. Bu çalışma, Çin'in uluslararası alandaki mevcut yükselen güç konumu çerçevesinde, Çin'in güç dengeleme stratejisini yine Çin'in yumuşak ve normatif güç stratejileri bağlamında analiz etmeyi amaçlamaktadır.

Anahtar Kelimeler: Güç Dengeleme, Yumuşak Güç, Normatif Güç, Uluslararası İlişkiler Teorileri, Çin.

China's Ambition to Balance Power within the Framework of
Soft and Normative Power Concepts

A comprehensive examination of Chinese foreign policy through the framework of power balancing reveals a profound integration of soft power in both theoretical foundations and practical applications. This integration can be attributed, in part, to the influence of prominent Chinese strategists, including adherents of Taoism, Confucius, and Mencius. These thinkers recognized that power could be cultivated through benevolence, morality, and effective governance. In contemporary China, the role of political, economic, national, and regional interests is evident in the diffusion of Chinese norms. In this context, China's normative power policies have a significant impact in shaping its foreign policy landscape (Nye, 2004).

As an emerging power, China undertakes a pivotal role in discussions about power-balancing within the fields of International Relations and Political Science. Realist scholars characterize rising powers as potential revisionist forces that may pose a threat to established powers or introduce risks to the international system (Ding, 2010). While some scholars assert that China qualifies as a revisionist state, citing its expanding economic and military capabilities, others argue that there is no inherent motivation for China to adopt a revisionist stance. The argument posits that China stands to benefit most from the current liberal international order (Ikenberry, 2008; Feng & He, 2020). Regardless of whether China is deemed a revisionist power, it is evident that China is increasing its political, military, and economic influence. Simultaneously, China is engaging in power-balancing manoeuvres by avoiding more assertive strategies.

The main question of this study is what factors motivate China to focus on soft balancing strategies rather than pursuing hard balancing instruments in its foreign relations.? We think that China is actively employing a power-balancing strategy, particularly directed towards Western powers, with a primary focus on the United States. Notably, China's approach to power balancing diverges from traditional methods, which predominantly rely on hard balancing strategies. China deliberately avoids the pursuit of hard balancing, a departure influenced by its historical legacy. Instead, China's power balancing is rooted in a soft balancing strategy within the broader framework of soft and normative power. The nation strategically employs soft and normative power to balance against the influence of the United States. We also try to demonstrate the influence of China's historical philosophical traditions on its foreign policy by highlighting China's commitment to peaceful rise, soft and normative power, and a possible shift towards hard balancing strategies in the future.

This study aims to examine China's expanding influence, specifically examining its power-seeking strategies, such as soft and normative power. The initial section of the article provides an extensive literature review, contextualizing the analysis within the broader discourse on power and power balancing. Subsequently, the study proceeds with an examination of China's strategies within the BRI, Non-Intervention policies, and the establishment of Confucius Institutes, with a particular emphasis on soft and normative power perspectives.

Methodology

Qualitative research is one of the significant methods in social sciences studies which is thought to play a leading role in the continuation and development of International Relations and Political Science in the foreseeable future (Mahoney, 2007; Bennett & Elman, 2007). This study attempts to use social sciences research methods to reach an academic analysis of power balancing theories and studies have been done on soft and normative power balancing conception.

With the help of qualitative research, we can conclude our research by finding answers to the questions asked and comprehending the theories used in the study. In this research, the primary resources will be based on the historical and present evidence of scholarly published books, journal articles, book chapters in edited books, and official documents, including official reports, newspapers, government publications, and the websites of Ministries and Embassies.

The Evolution of Soft and Normative Powers

Soft and normative power constitute integral elements of long-term political strategies within the field of international relations scholarship. These forms of power exhibit a comparatively gradual pace in achieving their objectives when contrasted with hard power. Conversely, the concept of soft balancing driven by normative and soft power has received relatively limited attention within the realm of political science and international relations.

Within the international arena, a state possesses certain characteristics that are pivotal for predicting its behaviour and the repercussions of its decisions. These include the ability to transform power, the capacity to transform potential power, and the possession of critical power resources (Nye, 1990). In such an anarchic system of international relations, a state may sense threats from other states. In this case, the threatened state may need to pursue balancing or bandwagon strategies (Elman, 2003; Papageorgiou et al., 2024).

A considerable number of realist scholars argue that a state's power in the international system is determined by factors such as its population, GDP[i], technology, geography, power status, the size of its military personnel and equipment, education level, and CINC score[ii] (Nye, 1990; Lake, 2007). These factors significantly influence a state's power-balancing strategies. If a country is relatively strong or has the potential to emerge as a major regional or international power, it will actively pursue power-balancing strategies and the above-mentioned factors will act as facilitators in the power-balancing process.

It is asserted that weaker states typically seek to balance against more powerful states, driven by shared interests in countering the influence of more powerful states. When the concept of balancing enters the discourse, and parties mutually agree to collaborate to counterbalance a dominant state, the dominant state is left with few options to prevent this development (Waltz, 1997; Waltz, 2000). Owing to the inherent imbalances in the global system, the power of a dominant state induces feelings of insecurity and unease among other states, compelling them to explore alternative strategies over an extended period. Consequently, states may opt for "internal balancing," focusing on enhancing their self-sufficiency or pursue "external balancing," which involves forming comprehensive alliances with other states against the established power to strengthen their sense of security. This endeavour continues until the dominant state, or states assume control or devise alternative strategies to reduce coerciveness. Balancing against a dominant state in isolation is perceived as challenging in the contemporary, high-stakes nuclear age. Thus, states may achieve a semblance of balance through the concept of soft balancing by building coalitions or alliances (Paul, 2005). In conclusion, this inclination facilitates a state's efforts to refine its power-balancing strategies to attain desired outcomes. Nevertheless, the state retains the flexibility to alter its balancing strategy at any time by making this policy highly adaptable.

The development of soft balancing depends primarily on political alignments and diplomatic initiatives. Simultaneously, aligning with the ascending power can lead to bandwagoning as a response to its ascent (McDougall, 2012). Conversely, Waltz contends that the actions of other states play pivotal roles in shaping the destiny of a state seeking power balancing (Waltz, 1979). When a state enhances its military capacity, other states may feel left behind, insecure, and relatively weak as explained in the security dilemma theory (Jervis, 1978). This trend, however, is not limited to hard power balancing; it is likely to appear in soft balancing, soft power, and smart power as well.

According to classical international relations theories, the power of states is predominantly determined by their military power, political influence, and material resources (Schweller, 1994). Hans Morgenthau argues that if a state seeks to augment its power and alter the balance of power in its favour, it will inevitably adopt a policy rooted in imperialism (Morgenthau, 1985). However, if a rising state is relatively weak, indicating a power vacuum around it, the rising state is likely compelled to fill that void (Schweller, 1994). The expansion of power and territory stands as the ultimate goal for states, aiming to extend their political, economic, and cultural influence on other countries (Wight, 1978). Generally, countries with closely matched power ratios tend to pursue a power-balancing strategy against the rival or more powerful state to limit potential threats.

Morgenthau claims that regardless of the type and level of balancing, the balancing process will ultimately culminate in hard balancing. Thus, soft balancing can be seen as a precursor to hard balancing. Therefore, a state may initially adopt a soft balancing strategy, but it retains the flexibility to transition to a more conventional approach at any stage of its soft balancing strategy (Morgenthau, 1967; Waltz, 1979; Claude, 1962). The satisfaction of balancing states is achieved when the limits of soft balancing are reached, which promotes a transition toward hard balancing. However, determining when a balancing state reaches this level of satisfaction is not easily predictable. Walt emphasizes: *"Balancing is defined as allying with others against the prevailing threat."* (Walt, 1987).

The perceptions of threat or the proximity of two rivals to each other can exert a crucial influence on the pursuit of a soft balancing strategy (Walt, 1985; Walt, 1987). Power balancing is indicative of a state's behaviour, as states often align to counteract a state seeking supremacy in power. In the modern era, a powerful state cannot maintain its pre-eminence indefinitely. When one state becomes more powerful, other states typically seek to form alliances against it to mitigate potential threats. Additionally, states may pursue policies aimed at increasing power by establishing external alliances, thereby fortifying their internal growth against future threats (Nye, 1990). In this context, the significant increase in power or the establishment of strategic alliances carries potential risks for the future of the superpower. Moreover, such actions may prompt the rival state to seek reasonable means to implement power-balancing policies.

As a balancing strategy, soft power is defined by its capacity to enable a state to achieve satisfactory balancing without resorting to coercive measures that influence other states' decisions; rather, it is based on the attraction and harmonization of common interests. Soft power is the ability to attain desired goals or outcomes by influencing the behaviours of others and persuading them to accept one's preferences (Nye, 2008). Robert Cox argues that as a balancing alternative, soft power is not any less significant than hard command power; if recognized as legitimate by others, it encounters less resistance when aiming to achieve a result. States with attractive ideologies and cultures are more likely to be followed willingly by others (Cox, 1987; Nye, 1990). Therefore, the more attractive and legitimate policies a state adopts in establishing alliances, the easier it is to achieve balancing goals.

On the other hand, some scholars argue that any attempt to influence and balance against rivals may lead dominant states to transform into hegemonic powers by enabling them to push their limits and potentially result in the emergence of a status quo power. However, such a state would not be considered a hegemon, as a hegemon is an authoritative state capable of ruling over many others in the political system of its time (Mearsheimer, 2001).

Normative power represents a significant source of influence, and various early definitions were provided by Carr, Galtung, and Duchêne. Carr's attempt to define normative power included economic, military, and ideational dimensions (Carr, 1962). Galtung highlighted 'ideological power,' by emphasizing the influence of ideas while also acknowledging other forces such as punitive, rewarding, resource, and structural power (Galtung, 1973). Duchêne, on the other hand, sought to characterize

normative power within the framework of idée force, beginning with the perspectives of the 'founding fathers' and influencing political characters (Manners, 2002; Duchêne, 1973).

In the context of global governance, normative power is defined as the ability to systematize norms among actors and ensure their dissemination in global governance. Consequently, actors aiming to exercise normative power are likely to seek changes in the existing normative order in line with the norms they intend to implement (Peng, 2020; Wunderlich, 2013). Manners conceptualizes normative power as the capacity to shape conceptions of norms in international relations or the global arena (Manners, 2002). In this context, China is an example that appears inclined towards this strategy, notably reflected in its non-intervention policies since the establishment of the People's Republic of China.

Some scholars researching normative power contend that its influence on the perceptions of other international actors is relatively limited and not necessarily direct. Instead, they argue that normative power influences other actors primarily by shaping the framework of their responses (Kavalski, 2013). Similarly, Womack defines normative power as the ability of an actor to significantly influence the actions of others (Womack, 2008).

Ian Manners asserts that normative power and normative justification carry more weight than physical force and material incentives. Thus, to comprehend the normative impressively, it is crucial to understand its impact, actions, and underlying principles (Manners, 2009; Kavalski, 2013). The effective exercise of normative power is essential for states to disseminate their norms successfully. Consequently, normative diffusion strategies must be attractive and practical, ensuring that the normative values communicated do not carry a hostile meaning globally or towards targeted regions and states.

Normative power, according to Manners (2002), is the ability to shape the behaviours of others concerning what is deemed tolerable, intolerable, or considered normal. Similarly, Diez argues that normative powers must have the consent of others, while Jackson emphasizes the importance of earning legitimacy and posits that tolerance is a fundamental component of normative power (Jackson, 1975; Kavalski, 2013; Manners, 2002; Diez, 2013; Diez, 2005). Thus, the normative values a state seeks to disseminate should be aligned with the specific norms and values of the targeted areas. In fact, for real success in the normative power process, it is an indisputable fact that a state must have qualities such as attractiveness, tolerance, normality, consent, and feasibility that are compatible with the above-mentioned factors.

China's Power Balancing Strategy

China's foreign policy has been deeply influenced by the historical and philosophical thoughts of Chinese thinkers. The Chinese government aims to chart a course that aligns with its political achievements throughout history. As Amitav Acharya righted, current Chinese foreign policy cannot be separated from Chinese traditions and cultural values. It finds its roots in the Chinese concept of Tianxia ideolojy and the philosophies of Confucius, Mo-tzu, Lao-tzu, Han Feizi and Xunzi. China has achieved significant great power status on both the national and international fronts. The recent actions by China demonstrate an effort to showcase both soft and hard power, particularly in regions such as Africa, where it seeks to outshine the West or leverage its influence over Western powers (Acharya, 2019). However, like other rising and established powers in political history, China needs to prepare itself against potential political threats or take responsibility for its hierarchical position in the international arena.

Some Chinese scholars argue that when China faces a moderate threat, it tends to act in accordance with the principles of both Confucianism and realpolitik. Confucianism influences Chinese leaders to adopt

a non-aggressive stance when in an advantageous position, while realpolitik prompts more assertive actions when facing disadvantages in relations with rivals. The current shift towards a negative or competitive policy is attributed to the escalating tensions in South Asia (Feng & He, 2019). The structural power transition within the global system is widely believed to increase the likelihood of conflicts between rising powers like China and established powers such as the United States (Organski, 1968; Feng & He, 2019). Among the potential adversaries, the United States stands out as a significant contender for triggering a major conflict with China. This is not only due to the perception of China as a formidable military rival but also because the United States recognizes China as a critical economic and soft power, which can significantly impact United States interests globally. Consequently, China's evolving political stance and its emphasis on increasing military expenditures to pursue a proactive and assertive foreign policy can be traced back to its dissatisfaction with the foreign policies of the United States and other Western powers. China has become the second country to spend more on military expenditures and increase its militaristic capabilities.

Some scholars argue that despite the numerous United States air bases in the Pacific Ocean, there are only two of them near the Taiwan Strait. Therefore, they argue that the likelihood of a conflict between China and the United States is relatively low. It is unlikely that one of these countries would willingly escalate tensions, as this would expose them to the risk of a violent and unstable war accompanied by economic and welfare losses (Shlapak et al., 2009; Montgomery, 2014). In the contemporary geopolitical landscape, the reliance on hard power to resolve political issues among major powers is not the favoured approach. In the 21st century, nuclear escalation and militaristic operations are not only riskier but also increasingly costly. A decade ago, U.S. officials acknowledged their support for East Asian treaty allies such as Japan, South Korea, Australia, Thailand, and the Philippines by deploying 60 percent of its naval forces in the Pacific. Additionally, there has been a deepening of cooperation with emerging regional powers like India, Indonesia, and Vietnam (The White House Press Office, 2013; Clarke, 2018). In this sense, China may not have seen this as just a simple collaboration of alliances, but probably as an attack on its security in the future. These factors have certainly contributed significantly to the rising tensions between China and the United States.

John Mearsheimer argues that great powers consistently strive to leverage allies and rivals to uphold the balance of power. Additionally, they often seek to utilize conflicts between rival states to maintain their dominance in the prevailing global political order. Accordingly, Mearsheimer claims that as China strengthens, it is likely to adopt a more assertive stance in its foreign relations (Mearsheimer, 2001). In contrast, Joseph Nye diverts our attention by asserting that an equal distribution of power in world history has been a rare occurrence. Attempts by states to balance power have typically resulted in wars (Nye, 2004). Similarly, Ding argues that, from a realistic perspective, the ascent of a new great power is often perceived as a threat to global security as well as may lead to conflict (Ding, 2010).

During the visit of the Prime Minister of the People's Republic of China to Myanmar in 2005, a statement was made emphasizing China's non-interference in Myanmar's domestic affairs. This statement served a dual purpose: first, as a demonstration of a behavioral pattern that China sought to establish, and second, as a message from China to the Western world, Middle Eastern states, Africa, and Central Asia (Chen, 2007). Essentially, for China to refrain from intervening in the internal affairs of other nations is both an indication of its preferred behaviour and a strategic measure to protect itself from external interference in its sensitive internal issues such as Taiwan, Tibet, and Xinjiang.

According to Waltz, in bipolar world politics, power has assumed a broader scope as a tool of competition. Military preparedness, economic growth, and technological advancements have become constant sources of concern and intensity in the international arena. On the other hand, Gilpin argues that beyond economic, militaristic, and technological factors, factors such as the quality of political

leadership and public morale can have much more significant effects on political events (Waltz, 1979). In this context, China's recent political activeness, its leadership for economic cooperation, its increasing investment in other regions and countries, and its cultural activities are critical factors that increase the Chinese power-balancing bargain.

Given China's economic and technological position, its role in the context of balancing power on the global stage is becoming increasingly evident. Waltz also suggests that as a superpower, the United States will face balancing efforts. This may occur through one or more states aligning their capabilities to counterbalance the United States, potentially leading to the reconstruction of a multipolar international system (Waltz, 2000). However, the nature of this balancing remains unclear, whether it is hard balancing or soft balancing.

Chinese President Hu Jintao declared that China follows the path of peaceful development due to its history and traditional culture (Ai, 2011). Accordingly, peaceful development, win-win strategies, and peaceful coexistence principles underscore China's effort to align its international standing with its commitment to historical and cultural values. In this context, some Chinese scholars argue that recognition of a responsible major or rising power should not be unilateral; rather, it should be determined by the acceptance and judgment of other states or powers (Feng & He, 2020). When other states and powers perceive China as a rising power, they are also likely to recognize its power-balancing potential. Hence power competition will inevitably arise.

China's global position has allowed it to present itself as a responsible and reliable international actor that offers alternatives such as the BRI, Shanghai Cooperation Organization, Asian Infrastructure Investment Bank, BRICS, and the New Development Bank to Western actors and institutions. In particular, China has generally avoided interfering in the internal affairs of other nations and has taken a cautious approach to establishing full relations with numerous international institutions and regimes (Lanteigne, 2005). China deliberately avoids excessive dependence on international institutions, aiming to distinguish itself from Western states in the formulation of its international policies, with the goal of attracting more countries to collaborate with China.

In recent years, China has been expressing soft power discourse more and more frequently. This shows that China will struggle to increase its soft power more actively in the future. Since Chinese policymakers emphasize that the cultivation of soft power is as crucial as the economic advancements that have elevated China to great power status. Consequently, China actively pursues soft power policies to achieve its long-term political and economic objectives (Xinhua News Agency, 2007). Consequently, China is likely to strengthen its international position to emerge as an important player in power dynamics and balancing concepts in the international arena.

It is argued that China's policy of peaceful rise and non-interference in international affairs has led many countries to perceive themselves as contributors to the preservation of China's national and international values. However, the Chinese government views these policies as specific and concrete approaches to international relations with various actors (Womack, 2008; Kavalski, 2013). While some may interpret China's non-intervention policy as a manifestation of strategic sovereignty. However, China does not appear to be seeking to establish sovereignty and does not see the need to do so. China actively promotes the policy of non-intervention as a norm in Chinese foreign policy on a global scale.

Balancing an established power, particularly the United States, through hard power strategies is currently seen as extremely challenging; leading countries are unlikely to attempt to balance military or hard power against a superpower (Wohlforth, 1999). Instead, the strategy for balancing a superpower, such as the United States, is perceived to be more effective when grounded in non-militaristic goals and soft balancing components, including economic, diplomatic, and institutional strategies (Layne, 2014;

Pape, 2005; Paul, 2005). Scholars analyzing China's approach to balancing the United States argue that, due to limitations in resources, technology, and recent military experience, China needs to explore asymmetric approaches to create deterrence and avoid potential confrontations (Montgomery, 2014). In parallel with these arguments, China is likely trying to demonstrate its peaceful approach to international relations and gain more supporters in the world by strengthening its soft power discourse while avoiding militarist and hard-balancing strategies. As a result, China aims to balance the United States by reaching the level of deterrence in power balancing.

On the other hand, the shift in Chinese foreign policy, notably with the 18th National Congress of the Communist Party of China (CCP), marked the transition from an old approach to a new one shaped by the Xi Jinping administration, known as the "great revival of the Chinese nation-the Chinese Dream." Departing from a low-profile foreign policy, China under the Xi administration established initiatives like the Asian Infrastructure Investment Bank and the Belt and Road, fostering a more self-confident and assertive stance in international relations. The Chinese Government emphasizes that any country seeking cooperation with China must respect China's core interests (Zhou, 2019). In this context, empirical evidence of China's more assertive foreign policy can confirm the claim of a shift from a traditionally peaceful stance to a more proactive stance. China's foreign policy decisions over time, statements, and analysis of their actions can be examined to detect shifts towards a more proactive stance, especially in the context of tense relations with Taiwan, Hong Kong, neighboring states in South Asia, and internal issues such as Xinjiang and Tibet, where China has always claimed that Western states are intervening.

Under the Xi administration, China's proactive stance in norm transmission has increased significantly, especially in environmental diplomacy. China employs the norm diffusion approach not only to signify the rise of a new great power but also to safeguard its political and economic interests (Peng, 2020). Consequently, China adopts a distinctive normative power strategy, guided by principles of non-interference, mutual respect, and win-win policies (Womack, 2008; Kavalski, 2013; Peng, 2020). This strategy is not only based on China's national and international interests but also aims to position China as a reliable global power and invite international partners to reasonably share global opportunities.

China's increasing political and economic influence has led the country to aspire to play a more significant role in global governance, emphasizing its status, values, and interests. China's BRI is strengthened by a multilateral grand strategy focusing on security, influence, and status. This kind of multilateral cooperation has the potential to facilitate a peaceful transformation of the existing international system and help China avoid the 'Thucydides Trap' (Zhou & Estaban, 2018). In addition to seeking a critical role in the international system through initiatives like the Asian Infrastructure Investment Bank, China also aims to reshape the global financial system. China is increasingly encouraging countries cooperating with China to use local currencies in their bilateral trade to internationalize the Chinese Yuan. As part of its strategy to enhance soft power influence, Chinese leaders have implemented a form of "smile diplomacy," organizing a series of visits to other countries (Blanchard & Lu, 2012). On the other hand, it should be underlined that the military and economic ascent of China bears a risk of conflicts with the United States, as the United States military posture has not been balanced since the collapse of the Soviet Union.

In recent years, China has focused its efforts on increasing its influence in the Asia-Pacific region; This indicates a significant increase in its political, economic, and military presence. As a result, the United States perceives China as a threat to its political and strategic interests and encourages the announcement of a strategy to minimize China's growing influence in Asia (Montgomery, 2014). The possibility of China and the United States falling into the Thucydides Trap, which Allison (2017) defines as the "Destined War", remains to be a critical issue discussed in the international arena. Despite

these uncertainties, the United States continues to seek deep engagement in response to the rise of China and aims to strengthen its defence capabilities in the Asia-Pacific (Montgomery, 2014). Just as China is dissatisfied with the United States presence in South Asia, the United States is also dissatisfied with China's increasing international influence.

As it is widely known, China is dissatisfied with the current international governance order, as China perceives it as shaped by Western and colonial powers (Zhou, 2019). Intending to reshape the international governance system, China seeks to implement its governance norms and policies. Leveraging its historical advantage of lacking a colonial record, China aims to promote a peaceful coexistence model through win-win cooperation strategies. As highlighted by Acharya, China supports both a universal, egalitarian, and inclusive world order and a realpolitik hierarchy in the region to safeguard regional sovereignty and national interests. This dual approach represents a characteristic of Chinese foreign policy that China desires to implement in the current international system (Acharya, 2019).

An important point to note is that China's power-balancing strategies differ from those of Western countries. Like socialism with Chinese characteristics, power balancing in China also exhibits China's unique characteristics. Timo also emphasizes that China's soft power standards should not be compared with Western standards accepted by scholars such as Nye, Schambaugh, Ikenberry, and the Pew Research Center (Timo, 2014). However, it is acknowledged that China faces some challenges, such as the less developed appeal of Chinese education and the lack of Chinese cultural influence, leaving China behind developed countries (Zhou, 2019). To address this, China has established Confucius Institutes around the world by teaching Chinese and spreading Chinese culture to increase its soft power. These institutes operate in almost every country and region, and their numbers are increasing day by day (Dig Mandarin, 2024). With the establishment of Confucius Institutes, China aims to ensure that the world and China mutually better understand each other. (Han, 2011). Another component of China's soft power deployment is the China Global Television Network (CGTN) and its official websites established globally to strengthen Chinese normative and soft power in various languages such as English, Arabic, Arabic (e.g., CGTN EUROPE, CGTN AFRICA, CGTN AMERICA). Russian, Spanish, and French.

China asserts that the principles of "core interests" are non-negotiable. President Xi aims to maintain a diplomacy based on great power diplomacy and establish China as a dominant power in certain regions to counter the United States military presence. Employing Chinese nationalism, history, and national identity, the CCP seeks to balance international pressures and address domestic issues (Peng, 2020; Wunderlich, 2013). This political inclination has raised concerns in the United States, with the deputy director of the CIA stating that Beijing is waging a "cold war" against the United States (Tarabay, 2018). While many states maintain economic and diplomatic ties with China, they also have the capacity to limit China's political and economic development. These states can challenge Chinese interests with support from the United States. In this respect, China's soft balancing strategy is seen as a necessary policy.

Consequently, China's foreign policy is observed to align with principles of a peaceful rise, non-intervention policies, and emphases of win-win cooperation and harmony. This is supported by the actual implementation of initiatives such as the BRI and the establishment of Confucius Institutes. China has actively pursued soft and normative power strategies to enhance its influence on the global stage. China's soft balancing strategy aligns with its historical values and traditions. By examining China's historical context, we may need to discover examples where China's foreign policy decisions and actions reflect a commitment to soft balancing, such as prioritizing diplomacy and economic cooperation over military aggression.

Non-Intervention Policies as a Normative Strategy

The roots of modern Chinese normative power can be traced back to the Mao Zedong era, particularly to the "Ten Principles" articulated in 1955 during the Bandung Conference. During this period, China's then Prime Minister, Zhou Enlai, proposed the "Five Principles of Peaceful Coexistence" in 1953 between the Chinese and Indian governments. These political principles are based on mutual respect for sovereignty, peaceful coexistence, territorial integrity, equality, mutual non-interference in domestic affairs, and mutual benefit in political and economic cooperation (Ministry of Foreign Affairs of the People's Republic of China, 2020). Since then, China has endeavoured to adhere to its principles and values in international relations.

In this vein, Chinese President Xi Jinping has emphasized China's commitment to these principles by expressing readiness to establish political relations with states willing to accept the principles of the new China. Under President Xi's administration, China not only upholds its principles and values but also aspires to see other states adopt these principles. President Xi's statement reflects China's desire to foster a global environment where these principles guide international relations:

> For 60 years, the Five Principles of Peaceful Coexistence have struck deep roots and flourished in China, India and Myanmar. Meanwhile, thanks to the important contribution made by the three countries, these principles are accepted in other parts of Asia and the world. China believes that the successful application of the Five Principles in international relations fully testifies to their strong vitality. (Ministry of Foreign Affairs of the PRC, 2014)

The Five Principles of Peaceful Coexistence strategy was established among China, India, and Myanmar in the early 1950s. This political initiative should not only be seen as a framework that guides China's foreign policy on the international stage; Rather, it represents an important step in the expansion of China's normative power (Zhou & Estaban, 2018). China has further sought to enhance its soft power by putting forward concepts such as Peaceful Development, Peaceful Coexistence, Peaceful Rise, a Harmonious World, and a Community of Common Destiny (Zheng, 2005, Zhou & Estaban, 2018). These articulated principles signify China's commitment to fostering peaceful international relations and a shared global destiny. As President Xi stated: *The Chinese nation has always held such beliefs as "peace is most precious", "harmony without uniformity", "peace among all nations" and "universal love and non-aggression".* (Ministry of Foreign Affairs, the People's Republic of China, 2014).

The Chinese Government aimed to establish the concept of building a harmonious world, contributing to the strengthening of China's narrative of peaceful power amidst the nation's increasing normative influence. In line to play a more substantial role as a responsible rising global power and enhance China's soft power and normative power, President Xi introduced the concept of common destiny and shared interests within the global community (Xinhua News Agency, 2007; Zhou & Estaban, 2018). China strives to promote not only the Five Principles of Peaceful Coexistence but also other components of Chinese norms and values; It strives to not only elevate China's role as a normative power but also to spread these norms and ideas across the continent to promote a positive future for the BRI in the context of regional cooperation. However, there are also opposing voices among Chinese scientists who are dissatisfied with China's non-intervention policy and advocate the establishment of military bases and alliance policies (Shen, 2010; Wang, 2017; Feng & He, 2020). The main motivation behind such perspectives is the increasing scale of Chinese investments around the world, which necessitates China's capacity to protect its overseas interests. As a result, the argument is made that China may need to use force to resolve certain overseas issues. Accordingly, historical data and diplomatic records can be examined to verify China's commitment to a peaceful foreign policy since the founding of the People's Republic of China. On the other hand, recent diplomatic tensions or military conflicts indicate that the risk of conflict between China and established superpowers persists.

BRI as a Component of Power Balancing Strategy

The Chinese government has established the BRI as an important economic and political tool shaping a new global geopolitical landscape. Beyond its role in setting ambitious economic agendas and fostering regional economic collaboration with numerous countries along its path, the BRI is strategically employed by China as a tool to advance its geopolitical and geostrategic interests in Eurasia, the Middle East, and other regions (Zhou & Estaban, 2018). The importance of the BRI is further emphasized by the cooperation willingness of countries along the route to cooperate in line with President Xi's win-win economic concept. China is keen to reap the benefits from this collaborative process. In parallel, President Xi confirmed:

> China will enhance friendship and cooperation with all countries involved in the Belt and Road Initiative on the basis of the Five Principles of Peaceful Co-existence. We are ready to share practices of development with other countries, but we have no intention to interfere in other countries' internal affairs, export our own social system and model of development, or impose our own will on others. In pursuing the Belt and Road Initiative, we will not resort to outdated geopolitical maneuvering. What we hope to achieve is a new model of win–win cooperation. We have no intention to form a small group detrimental to stability, what we hope to create is a big family of harmonious co-existence. (Xinhua News Agency, 2017)

China constantly emphasizes the importance of cooperation and harmony in its foreign relations. In this context, Keohane argues that cooperation results from the alignment of actual and expected preferences between actors. Simply put, cooperation occurs when a government's policies are accepted by its partners, facilitating the achievement of common goals. On the other hand, harmony is achieved through the independent policies of the state, without depending on the opinions of others. Policy coordination is ongoing to encourage states to adjust their policies according to the guidance of other states. Although alignment has close ties to cooperation, it does not involve complex bargaining or negotiations. Cohesion is apolitical and communication is relatively minimal. In contrast, collaboration is political and requires changing behaviour through positive and negative incentives (Keohane,1984).

The BRI stands as a crucial strategic tool for China, serving the purpose of establishing strong trade links between China and European markets, which are among the most dynamic markets in the world today. China envisions creating a sea express route that will connect China's Xinjiang region with the port of Piraeus, an important European port and trade centre bridging the Balkans and the Middle East. This initiative is designed to bolster China's economic strength, internationalize the Renminbi[iii] and diversify energy routes and suppliers (Casarini, 2016; Zhou & Estaban, 2018). The BRI should therefore be viewed not only as an economic cooperation between Asian countries but also as a strategic move that positions itself as China's 'Pivot to Europe' strategy in response to the United State's 'Pivot to Asia' strategy (Fallon, 2014).

China's BRI strategy is strategically aligned with a multilateral soft balancing approach, aiming to weaken U.S. dominance and influence while simultaneously advancing China's normative power by projecting its values and interests to reshape global governance (Zhou & Estaban, 2018). BRI offers a development paradigm of cooperation to participating parties in the context of investment, trade facilitation, and financial integration in many areas (Yildirimcakar & Han, 2022). The BRI has undeniably enhanced China's standing in the international arena; however, it also brings political risks such as geopolitical competition, territorial disputes, and security threats.

Prominent Chinese scholar Wang Jisi argues that through the BRI, China is not only implementing the 'March to the West' (西进) strategy but also using it as a power balancing tool against United States policy (Sun, 2013). The United States has pursued strategies to contain China and limit its growing

influence in South Asia, particularly in regions such as the Taiwan Strait, South China Sea, Indian Sea, and Malacca Strait. This containment effort by the United States was aimed at curbing China's expanding economic influence, exemplified by the establishment of significant economic cooperation under the Trans-Pacific Partnership (Devadason, 2014; Zhou & Estaban, 2018). In response, China aspires to have a profound influence in shaping a new world order characterized by harmonious and peaceful coexistence (Zhou & Estaban, 2018). As a result, China's increasing global influence is intensifying the strategic competition between China and the United States. This concentration is making progress within the framework of win-win opportunities and investment promises to the countries that China has partnered with through the BRI.

Alignment with China is becoming increasingly important, especially for many countries that are close to China or do not have advanced relations with the United States and other Western powers. These nations think they will achieve greater political and economic gains by aligning with rising powers. On the contrary, for China to rise significantly, cooperation with these countries based on mutual trust and respect is essential (Zhao & Qi, 2016). This type of cooperation not only provides a sense of security but also facilitates win-win cooperation, both politically and economically by fostering China's soft power. At the 17th CPC Congress, then-Chinese President Hu Jintao emphasized the importance of the soft power of Chinese culture with the following words

> Culture has become a more and more important source of national cohesion and creativity and a factor of growing significance in the competition in overall national strength… We must enhance culture as part of the soft power of our country to better guarantee the people's basic cultural rights and interests. (Xinhua, 2007)

Zhou Enlai, the First Premier of the People's Republic of China, summarized this importance with the phrase *"外事无小事"*, meaning "there are no small things in foreign affairs" (Feng & He, 2020). Consequently, cooperation with any country has deep significance in Chinese Foreign Policy, as China seeks partnerships to sustain its economic growth and increase its influence in the international arena, soft power is a critical tool for Chinese academics and political elites to achieve great power status *(综合国力- zonghe guoli)* which means increasing China's comprehensive national power.

In pursuit of tremendous achievements, China has adopted the identity of a great nation by taking advantage of its large population, vast territory, and rapidly growing economy. Widely considered a potential revisionist power, China is seen as a rival that could challenge United States interests in East Asia. Moreover, there is a widespread belief that China has significant soft power potential and can attract global attention with its unique ideas, values, and initiatives such as the Belt and Road Initiative (Ding, 2010; Waltz, 2000). Examining official documents, speeches, and policy implementations can provide evidence of China's goals, including the continuation of non-interference policies and the realization of the Chinese Dream through the Belt and Road Initiatives and win-win strategies. However, the prospect of protecting expanding overseas interests may lead to the adoption of strict balancing strategies in the future. Future empirical research could therefore focus on monitoring China's foreign policy decisions and actions to identify situations where a shift towards strict balancing strategies is evident. This may include examining military formations, alliances, or confrontational postures in response to perceived threats.

Confucius Institutes

Confucianism stands out as one of the most influential movements that has significantly shaped the behavior of the Chinese people. Confucius constantly emphasized the importance of morality not only for Chinese people but also for individuals from other cultures. In this respect, Confucian thought is closely aligned with soft power principles, emphasizing attraction over coercion. In this context, one of the fundamental tenets of Confucianism is summarized in the phrase *'lai er bu ju, bu wang jiao zhi' (来而不拒, 不往教之)* (Nye, 2004 ; Feng & He, 2019), "advocating an open approach to those seeking knowledge and refraining from imposing teachings without solicitation". As Shambaugh observes, China differentiates itself by pursuing a broader agenda, holding summits, media initiatives, conferences, sporting events, and educational exchanges (Shambaugh, 2015). As a result, Confucius Institutes have a global structure, and their large-scale activities indicate China's effort to increase its normative and soft power influence. Therefore, the existence and influence of Confucius Institutes observed in different regions will provide empirical support for China's strategy to increase soft power.

Confucius Institutes, which are present globally, operate primarily in university environments, playing important roles in connecting Chinese and foreign stakeholders, facilitating business activities, and disseminating Chinese culture and language (Yellinek et al., 2020). Consequently, those intrigued by China, including its culture, history, philosophy, and language, will easily become accustomed to what the Confucius Institute has to offer. Therefore, China aims to promote recognition of and a positive attitude towards its traditional and political norms and values.

Abundant evidence underscores China's determination to develop soft power strategies. This evidence includes diplomatic visits, educational exchange programs, participation in multilateral forums, the establishment of Confucius Institutes around the world, the BRI, and the influence of China's state-owned media outlet (CGTN). As China establishes increasingly interactive and bilateral relations with various countries, it aims to ensure acceptance of China's future political and economic strategies.

Conclusion

Modern China's foreign policy is deeply shaped by its historical philosophical traditions. Discussions about China's peaceful policies are also echoed in China's domestic discourse. However, as it has been the case throughout Chinese history, China's foreign policy has consistently embraced the struggle within the framework of the principles of peaceful rise. It has shaped its soft power strategy in its foreign relations with the logic of win-win cooperation. In this context, China has seized important opportunities to increase its soft and normative power by pursuing non-interference policies, the BRI, and the establishment of Confucius Institutes. However, the prospect of protecting its expanding overseas interests may force China to pursue strict balancing strategies in the future.

Positioning itself as a rising great power, China strategically implements power-balancing tactics in the field of soft and normative power. Moving away from Western powers, China follows a soft balancing strategy in line with its historical values and traditions. Considering China's political history, it seems that China does not implement a strict balancing strategy unless forced by external powers. China's lack of a colonial past and its commitment to a peaceful foreign policy make it easier to establish multifaceted relations with other countries. In this context, China has the opportunity to present itself as an alternative to the dominance of established superpowers, especially the United States. However, the rise of China and balancing strategies in the context of normative and soft power brings with it the risk of conflict with existing global powers. As China's strategic and cooperative behaviour on the global stage improves, China will make progress toward becoming a superpower. However, it is not yet clear whether China will be able to maintain its current peaceful foreign policy in parallel with its increasing power.

Compliance with Ethical Standards

Ethical Approval

Ethical approval for this study is not applicable.

Author Contributions

The author confirms the sole responsibility for the following: study conception and design, data collection, analysis, writing, and revision of this article.

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Notes

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[i] GDP is the abbreviation of Gross Domestic Product

[ii] Cinc score is the abbreviation of the Composite Index of National Capabilities score.

[iii] Renminbi is usually used for Chinese Currency in China instead of Yuan.

Flexible Working from the Perspective of Media Sector Managers*

Medya Sektörü Yöneticilerinin Perspektifinden Esnek Çalışma

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Abstract

One of the most significant alternative work arrangements that emerged during the pandemic has been flexible working. During this period, many sectors were compelled to rapidly adapt to this new work model. The main purpose of the research is to understand and explain the concept of flexible working (FW), which has emerged due to the rapid development of today's technologies and the changes in business life and social environment, through the media sector. The qualitative method was preferred, and phenomenology was chosen as the research design. The media sector was preferred as a sector where flexible working is common, and the data was obtained from semi-structured interviews with middle and senior managers of companies in the sector. 64 codes obtained from the data were collected under 6 themes that provide semantic integrity. As a result of the research, it was observed that the participants were introduced to the concept of flexible working during the Covid-19 period and had the opportunity to experience their models during the pandemic period. Contrary to the literature, it was determined that the participants had much less knowledge and experience about flexible working models. A form of flexibility has often been found to be defined in terms of current needs rather than just training.

Keywords: Flexible Working, Pandemic, Covid-19, Media Sector, Phenomenology.

Öz

Pandemi sürecinin ortaya çıkardığı en önemli alternatif iş yapma biçimlerinden biri esnek çalışma olmuştur. Bu dönemde, pek çok sektör hızla bu yeni iş modelini deneyimlemek zorunda kalmıştır. Araştırmanın temel amacı; günümüz teknolojilerinin hızla gelişmesi ile iş hayatında ve sosyal çevrede yaşanan değişimler sonucu ortaya çıkmış olan esnek çalışma kavramını medya sektörü üzerinden anlamak ve açıklamaktır. Araştırmada nitel yöntem tercih edilmiştir ve araştırma deseni olarak fenomenoloji (olgu bilim) seçilmiştir. Esnek çalışmanın yaygın olduğu bir sektör olarak medya sektörü tercih edilmiş, sektördeki şirketlerin orta ve üst düzey yöneticileri ile yarı-yapılandırılmış görüşmeler yapılmıştır. Verilerden elde edilen 64 kod anlam bütünlüğü sağlayan 6 tema altında toplanmıştır. Araştırma sonucunda katılımcıların esnek çalışma kavramı ile Covid-19 döneminde tanıştığı ve modellerini pandemi dönemi boyunca deneyimleme fırsatı olduğu gözlemlenmiştir. Katılımcıların esnek çalışma modelleri hakkında literatürün aksine çok daha az bilgi ve deneyim sahibi olduğu tespit edilmiştir. Genellikle bir eğitimden öte o anki ihtiyaca göre bir esneklik tercihinde bulunma şeklinde iş yapılış biçimleri tanımlanmıştır.

Anahtar Kelimeler: Esnek Çalışma, Pandemi, Covid-19, Medya Sektörü, Fenomenoloji.

Flexible Working from the Perspective of Media Sector Managers

The ongoing global impact of the pandemic, coupled with technological advancements, has necessitated significant changes in the realm of work. In response to this wave of transformation, companies have increasingly begun to scrutinize traditional working models and explore alternative approaches. Particularly, confronting newly emerging waves of change can place companies in challenging positions, complicating the adaptation process.

During the pandemic, companies transitioned their employees to remote or flexible working models due to factors such as lockdowns and the risk of infection. Nonetheless, it has been observed that many companies possessed limited or no prior knowledge of these working arrangements, and moreover, the legal framework for such systems remained underdeveloped (Baycık et al., 2021; Yürekli, 2020). Given the broad scope of the flexibility concept and the variety of flexible working models, several challenges have arisen in relation to its implementation. Consequently, the central focus of our research is the issue of how this concept is perceived and applied.

An examination of studies on flexible working in Turkey reveals the use of various conceptual classifications of flexible work (Tuna & Türkmendağ, 2020; Gürses, 2018; Öztürkoğlu, 2013; Başdoğan, 2015; Şafak, 2014; Taner & Negiz, 2018). These variations in classification can be attributed to the specific contexts of implementation and the flexibility conditions that these contexts afford. Accordingly, the media sector, which inherently incorporates flexibility due to its structural characteristics, has been selected as the focus of this research.

The principal objective of this research is to analyze the concept of flexible working, which has gained significant traction in contemporary working life, within the context of the media sector. Flexible working is assessed through semi-structured interviews conducted with managers in the media sector, and the data obtained has been analyzed using content analysis. The study seeks to address the following research questions:

- How is flexible working perceived by sector managers?
- What types of flexible working models are currently known and utilized?
- What outcomes (benefits and drawbacks) has flexible working produced?
- Does flexible working contribute to a competitive advantage?

It is anticipated that the research will illuminate the applications of flexible working within the sample of the Turkish media sector. This will enhance companies' awareness of flexible working and support their understanding of alternative methods. Identifying which models are actively recognized and utilized, along with determining the advantages and disadvantages these models provide to businesses, will yield valuable insights for other practitioners. Furthermore, the research will elucidate not only the advantages that flexible working can offer to organizations and employees but also the potential disadvantages it may entail.

Literature Review

Flexible Working

The concept of flexibility emerged in the context of the economic crisis of the 1970s, which was exacerbated by the Oil Crisis of 1973. One of the primary factors contributing to its subsequent proliferation was the increasing rate of unemployment. In response to the economic downturn and with the objective of mitigating unemployment levels, flexible working models began to be incorporated into the labor market (TİSK, 1999, p. 11).

Flexibility is defined as 'the state of being adaptable, elasticity, and the capacity to adjust to changing conditions and circumstances' (TDK, 2022). In the context of business literature, flexibility encompasses the modifications made in work arrangements, career planning, and compensation systems (Seyyar & Öz, 2007).

There is currently no clear definition or established boundaries for flexible working. This concept emerges as a dynamic and evolving notion that can differ across continents, countries, companies, and even individuals.

Flexible working refers to new forms of work arrangements that do not adhere to the traditionally accepted 'eight-to-five, Monday-to-Friday' or 'working at a specific location, on specific days and hours' schedules. These arrangements are referred to as flexible working, atypical employment, or alternative work programs (Karakoyun, 2007, p. 5).

Flexibility should not be understood merely as the alteration of working hours and methods; rather, it entails a transformation of labor laws and practices through fundamental changes that align with the dynamics of the modern era and embrace new perspectives (Ekin, 1999). In the Dahrendorf Report, flexibility is defined as the ability of systems, organizations, and individuals to adapt appropriately by developing the capacity to adjust to conditions that vary according to new structures and modes of behavior (Tuncay, 2002).

The increasing demand for flexible working in today's world is driven by factors such as rapid communication, the emergence of new markets, the prevalence of short-term job designs, and swift transformations in markets (Karakaya & Uçar, 2015, p. 1).

In Turkey, the flexible working system has been considered a solution to address challenges in the labor market and reduce unemployment, gradually increasing its presence in the professional sphere. One of the main reasons for this is the acceleration in the pace of development and transformation in the field of technology. Companies must adapt to change for a better future and remain open to technological advancements and innovations (Zaim, 1990).

Research on this subject indicates that the implementation of flexible working has triggered many changes within the business world. Flexible working is proposed as a solution at the intersection of demands from work and family, potentially reducing this conflict (Booth & Van Ours, 2008). It is emphasized that flexible working enables employees to take a more active role in home and childcare (Kim, 2020) and that the flexibility provided in the work environment reduces job stress and absenteeism (Boltz et al., 2023).

On the other hand, flexible working enables women to engage in paid employment without reducing their unpaid domestic responsibilities, thereby facilitating their exploitation both at home and in the labor market (Chung et al., 2021). Furthermore, flexible working can lead to social isolation due to the lack of a specific work environment, or, through its abstract nature, contribute to job and income insecurity (Bozkurt, 2023, p. 73). Belek (2004) emphasizes that, despite all its advantages, flexible working leads to the exploitation of the working class while increasing the profit margins of capitalist enterprises. The flexible practices imposed by neoliberal policies have resulted in significant losses of rights for workers, while providing substantial cost-saving benefits for capital (Sevgi, 2023, p. 358). Another criticism of flexible working is that on-call, remote, or home-based workers are proportionally less likely to benefit from payments such as wages, compensation, and bonuses based on their hours worked. In this way, while the flexibility of the workforce is achieved on one hand, the blurring of the workplace definition makes it easier for employers to evade regulations on the other (Aydoğanoğlu, 2010).

Given the diversity of the mentioned studies and their emphasis on different aspects, it is evident that no definitive conclusion has been reached regarding both the definition of flexible working and the evaluation of its benefits and drawbacks. The concept evolves alongside technological and social changes, manifesting characteristics that allow it to adapt to the new order, much like a biological organism.

Flexible Working Models

Flexible working models are frequently preferred methods by employers to enhance employee productivity, ensure the continuity of active work, and maximize company profits, while providing employees with the freedom to choose their working hours and days (Mahiroğulları, 2005, p. 49).

Table 1

Flexible Working Models

Flexible Working Models	Definition
Part-time work	Employers utilizing the full-time working system can employ workers for shorter durations, differing from the conventional working model
Job sharing	It is the process in which multiple employees share the required tasks on a full-time basis or distribute the responsibilities necessitated by the job
Shift-based work	It refers to any work organization that extends beyond the normal 8-9 hour working duration of a company, differentiating it from standard 'daily work
Flexible working hours	It is a working model in which the employee is required to work during a specified time period as a block, while having the flexibility to determine the length of their daily working hours, as long as they do not exceed the average daily working duration within a given time frame
On-call work	The process of calling upon the workforce when needed
Compressed work week	It is the intensification of the normally practiced weekly working days through their reduction. To implement this model, working hours are increased while the number of working days is decreased
Remote work	It is the ability of the current or intermediary organization to fulfill the planned work in accordance with the agreement, allowing the employer to perform it from a location of their choice, with the employee's own home often being the preferred option.
Telecommuting	It refers to the process in which the employee manages their work externally through telecommunications tools and the internet, while being located away from the work center
Subcontracting	It refers to the process of fulfilling certain tasks required at the workplace using the workforce that is under the responsibility of another employer, rather than relying solely on the existing workforce
Lending employment relationship	It refers to the process in which an employer reallocates their existing workforce to another employer for a specified period and under an agreement

Source: Compiled from the researches of Öztürkoğlu, 2013; Şafak, 2014; Başdoğan, 2015; Kördeve, 2016; Gürses, 2018; Turan, 2017; Çelikkoparan; 2018; Serbes, 2019; Tuna & Türkmendağ 2020; Öztürk & Eyel, 2021.

Flexible working is a concept that encompasses all work practices outside the known classical working models (Selby et al., 2001). Changing environmental conditions compel businesses to develop different strategies, necessitating the creation of new working arrangements between employees and employers. For instance, in their study, Agcadağ Çelik (2021) focuses on the use and advantages of shared office spaces as a flexible working environment, while Erdayı (2021) addresses the problems arising from home-based teleworking practices. Therefore, both technological and social developments are prompting employers to explore alternative working arrangements to maintain high employee performance.

Types of flexibility are addressed under six main categories. These types are shaped by factors such as the number of employees, the training of employees to work in different departments, wages, working hours, the delegation of tasks to others, and the nature of the workplace (Erdal, 2016). Within these main elements, many new models have been developed.

It is observed that flexible working models are categorized differently in various studies. The flexible working models within the scope of this research are presented in Table 1.

Method

Design

In this study, a qualitative method was preferred in order to understand how individuals interpret their experiences and what meanings they attribute to them (Merriam, 2018, p. 5). Since the primary purpose of qualitative research is to examine specific phenomena or events in a context-sensitive manner, the researcher should evaluate the qualitative findings within their unique conditions (Yıldırım & Şimşek, 2013; Demirkasımoğlu, 2021). This qualitative study was conducted with a phenomenological design to provide insights into the experiences of media industry managers regarding flexible working during and after the pandemic. One of the most significant reasons for choosing qualitative research is the ability to explore the subject in depth by directly accessing emotions and thoughts, and to evaluate the phenomenon as it is.

Phenomenology is concerned with phenomena that we recognize in our lives but do not possess profound and detailed knowledge about (Gay et al., 2012, p. 121). In phenomenological design, the aim is to convey and explain the phenomenon without interpretation, based on the emotions, thoughts, and conditions of the participants (Özgener, 2005, p. 510). One of the primary reasons for selecting this design is to focus on phenomena that exist in our lives but are not fully comprehended, and to endeavor to understand individuals' perspectives and experiences regarding these phenomena (Yıldırım & Şimşek, 2018, p. 70). Phenomenology facilitates an understanding of "what it is like to experience" a phenomenon by revealing the perceptual and attitudinal orientations of individuals who encounter these phenomena. (Munhall, 2007). The primary aim of phenomenological research, which addresses individuals' conscious and intentional actions, is to uncover rich and complex descriptions that emerge within the context where the phenomenon occurs, thereby revealing embedded and experiential meanings (Finlay, 2009: 6). Based on this approach, participants of varying ages and experiences were asked to convey the phenomenon of flexible work in relation to their own subjective experiences. Through the phenomenological design, comprehensive findings were obtained regarding how the phenomenon of flexible work was constructed as a process by participants—both before, during, and after the experience—and the meanings underlying these experiences.

Participants

The target population of this research consists of senior executives working in media companies located on the European side of Istanbul. One of the main reasons for selecting the media sector as the research

population is the intensive application of flexible working practices in this sector both before and after the pandemic, as well as the frequent experimentation with various models. However, it is not feasible to interview all companies and executives within such a large sector. On the other hand, phenomenological studies indicate that interviewing between six and ten individuals, with a minimum of six, is sufficient (Creswell et al., 2003; Onwuegbuzie & Collins, 2007, p. 289). Based on this information, interviews were conducted with 11 senior executives working in the media sector on the European side of Istanbul.

Initially, a request for an interview was sent to the executives in the sector via email, proposing a date they deemed appropriate. While meetings were planned with those who responded, the process encountered a bottleneck at a certain point, leading to difficulties in reaching individuals within the sample. As a result, the snowball sampling method was employed. In this method, the researcher asks each participant to refer others who may be able to participate in the study (Altunışık et al., 2007). Based on these referrals, interviews were conducted, and this process continued until saturation of the sample was reached. Data obtained from the interviews with a total of 11 senior executives were then analyzed.

Five of the participants are male and six are female, with their ages ranging from 26 to 45. Among the participants, six are single and five are married. Their managerial experience varies from 3 to 25 years, with an average of 10 years. All participants hold senior executive positions and engage in flexible work. The variations in age and experience levels among managers are noteworthy. Since phenomenological research seeks to understand how participants subjectively experience a specific phenomenon, involving participants from different age and experience groups can yield rich and multidimensional insights. In fact, capturing distinct perspectives from both less and more experienced managers may enhance the depth of our understanding. Nevertheless, challenges related to comparability and generalizability could arise. Given that the diversity of participants contributes to the core research question and that the study does not aim to produce generalizable findings, this diversity does not necessarily imply bias.

Table 2

Characteristics of Participants

No	Gender	Age	Marital Status	Title	Management Experience (Year)
1	Male	40	Maried	Chief Digital Officer	20
2	Female	45	Maried	CEO	25
3	Male	26	Single	Head	3
4	Male	38	Maried	Director	5
5	Female	42	Single	Associate Chief Officer	20
6	Female	37	Maried	Director	5
7	Male	25	Single	Manager	3
8	Female	35	Single	Director	6
9	Male	37	Maried	Director	8
10	Female	35	Single	Manager	3
11	Female	40	Single	Director	11

Data Collection

In qualitative research, the interview technique is one of the most commonly used data collection methods. The data for this study were collected using a semi-structured interview technique. With this technique, participants were asked pre-prepared questions in a specific order, and in cases deemed necessary, additional questions were posed to gather detailed information (Yıldırım & Şimşek, 2013, p. 42). A structured interview form was designed utilizing insights from various studies (Öztürkoğlu, 2013; Şafak, 2014; Başdoğan, 2015; Kördeve, 2016; Gürses, 2018; Turan, 2017; Çelikkoparan, 2018; Taner & Negiz, 2018; Tuna & Türkmendağ, 2020; Geyik Küçük & Aydınlı Kulak, 2020; Serbes, 2019; Öztürk & Eyel, 2021). Seven questions were posed to gather detailed information regarding the primary issue of the study, which pertains to "how flexible work is perceived and implemented".

The interviews with participants were conducted between June 10 and November 10, 2023. Some of the interviews were held face-to-face, while others were conducted via video calls or telephone conversations at the participants' request due to work circumstances or transportation issues in Istanbul. The duration of the interviews ranged from 15 to 45 minutes, with the length being influenced by the participants' responses to the questions and the need for follow-up inquiries.

Data Analysis

The analysis of the data employed content analysis as the preferred method. Qualitative content analysis is a systematic approach used to examine qualitative data. This method provides opportunities to analyze explicit and descriptive content that results in categories, as well as implicit and interpretive content that leads to themes (Graneheim & Lundman, 2004). Content analysis consists of four fundamental stages. Firstly, the obtained data are divided into meaningful segments, and the conceptual significance of each segment is determined. In the second stage, the coded data, classified according to their common characteristics, are organized under themes that convey general meaning. In the third stage, the data arranged according to themes and codes are described and explained in comprehensible language. Finally, the findings are interpreted, and conclusions are drawn (Yıldırım & Şimşek, 2018, pp. 239-251).

A foundational framework supported by literature was established for the preparation of interview questions. The codings were derived through thematic coding, considering the conceptual framework. Before the data analysis, the initial conceptual structure was reshaped by integrating newly discovered findings, codes, and themes during the analysis (Strauss & Corbin, 1990). The codes generated through thematic coding were re-examined, and duplicates were merged and reduced. Subsequently, the reviewed codes were organized under the identified themes, along with the literature and questions. The codes and themes were finalized after consulting with experts. In the qualitative analysis process, no analysis software was utilized; the data were manually coded.

Ethical Concerns

Prior to the interviews, participants were provided with information regarding the purpose and scope of the research, and their verbal consent was obtained. Participants were informed about the recording of the interviews and the subsequent transcription process, and the necessary permissions were secured. They were assured that their names and information related to their organizations would remain confidential, and demographic characteristics would be specified. Ethical approval was obtained from the relevant institutional review board for the research. Access to the research data (audio recordings, files) is restricted solely to the researchers involved in the study.

<center>**Results**</center>

This section of the research shares the findings obtained from interviews conducted with executives in the media sector regarding flexible work arrangements. In the initial phase of analysis, a total of 920 codes were generated. Redundant codes that expressed similar meanings or appeared unnecessary or meaningless were eliminated, resulting in a final set of 64 codes. Ultimately, these 64 codes were grouped under six themes that provide coherence in meaning. The themes are as follows:

- Change Before and After Covid-19
- Perception of Flexible Working
- Flexible Working Experiences
- Learning Processes
- Outcomes of Flexible Working
- Competitive Advantage

Change Before and After Covid-19

The primary focus of our first theme is to understand the changes experienced in the work life during the pandemic and to relate these changes to flexible working. The majority of participants characterize this period with negative experiences. Codes such as "increased online meetings, elimination of break times, the concept of working hours has disappeared, and more intense work" have been frequently mentioned. When evaluating these codes, employees have expressed that the notion of time in work life has diminished with the onset of the Covid-19 period, and they have become more accessible. The previously common sentiment of "the workday is over; now I can focus on my personal life" has nearly vanished. However, some participants who approached the process differently emphasized the acquisition of new skills and a decrease in work intensity.

Table 3

Change Before and After Covid-19

Codes	Theme
Increased online meetings	
Elimination of break times	
The concept of working hours has disappeared	
Being reachable at any time	Change Before and After
New skills have emerged	Covid-19
Investments decreased, and work lightened	
Increased work intensity	
Demand for work on weekends or after six o'clock	

Individuals have become perpetually accessible due to flexible working arrangements, rendering work requests possible at any time during working hours. Participant K1, who characterizes the process negatively, and participant K8, who views it positively, have articulated their thoughts as follows:

"Transitioning to the remote work model resulted in a significant alteration in scheduling compared to the office environment. There is no longer a clear start or end time for working hours, nor is there a designated lunch break. Working in the office was more social; we were more flexible." K1.

"In our sector, a significant decline occurred due to the shock experienced during the first two months of the pandemic. With the decrease in investments, our workload has also eased. However, we experienced a pause in progressing with our tasks because we were uncertain about how to move

forward." K8

Perception of Flexible Working

In the second theme, the aim is to understand what participants perceive when they hear the term flexible working and what associations it evokes for them. An evaluation of the responses provided by the participants reveals that the codes related to flexible working are discussed in both positive and negative aspects.

Table 4

Perception of Flexible Working

Codes	Categories	Theme
Time and space flexibility		
Ability to work from any location		
To achieve autonomy	Positive	
Ability to adjust working hours and duration		
Work comfort		Perception of Flexible Working
Longer working hours		
Absence of fixed working hours		
Work intensity	Negative	
Lack of balance between work-personal life		
Being reachable at any time		
Absence of clear rules		

Participants who perceive flexible working positively have articulated that it grants them freedom, simplifies their lives due to the provision of both time and location flexibility, and allows them to allocate more time to themselves. In this context, one of our participants, K5, stated:

"When I think of flexible working, I envision a discipline of working independent of time and days. However, I believe that the flexible working implemented is not properly understood by institutions. Starting work at 9:00 AM from home is not the same as starting work at 9:00 AM from the office; this does not constitute a 'flexible working' discipline. I think a flexible working environment can be created if you can organize the delivery deadlines for the work to be done, whether individually or with your team members."

A group of participants, however, has evaluated the concept negatively, believing that flexible working disrupts the existing work-life balance and leads to increased workload. Some participants have expressed the following views on this matter:

"Actually, the first thing that comes to mind is not working from home or in the office, but rather being asked to work on weekends or after 6 PM." (K7)

"Unfortunately, when I think of flexible working, I envision a system where I can adjust my own schedule, but instead, it represents a negative connotation of excessive overtime." (K10)

Flexible Working Experiences

The third theme encompasses findings related to the flexible working models that have been implemented following the transition to flexible working. When assessing which models mentioned in the literature the participants are aware of, which ones they recognize, and which ones they utilize, a total of 12 codes have emerged.

Table 5

Flexible Working Experiences

Codes	Theme
Hybrid working	
Remote working and telecommuting	
Model offering options to employees	
Four-Day workweek	
Flexible office days	
Working at night	Flexible Working Experiences
One day in the office per month	
Monday-Friday holiday work schedule	
Open office	
Working from outside of the city	
8 hours at your convenience	
On-call work model	

Participants reported that they explored different models to ensure continuity in their work arrangements, adapting to the evolving circumstances of the process. In determining these models, the current situation and conditions were assessed, and work continued with the system that was believed to be most effective. One participant, K5, described their experience of trying out various work models as follows:

"After the first case appeared in Turkey in March, we quickly organized and adapted our entire technical infrastructure to a remote work system. Therefore, with the initial emergence of the pandemic, we chose the method of working from home. We continued in this manner for a long time. Later, our process of utilizing a hybrid office began. We opened the office primarily on a voluntary basis. We did not make it mandatory, but we allowed those who preferred not to work from home, who struggled to adapt to the home ecosystem, and those who wanted to socialize and were feeling isolated to come into the office. At times, this raised the question of which home this remote work referred to."

The topic of reducing the number of working days during the week, which has been implemented or experimented with in various countries, has also been evaluated by the participants. For instance, Participant K1 stated the following:

"I see the four-day work week as a model worth trying. I believe it has already been implemented in countries like Belgium and Iceland. Recent studies indicate that working four days a week leads to significantly higher productivity. There is data that should be taken seriously, showing that this model enhances daily productivity more than the traditional five-day work week."

Learning Processes

The fourth theme presents findings on how participants learned about flexible working models. When examining their learning processes, it becomes evident that none of the participants had received prior training on this topic. Instead, they reported that they learned about flexible working out of necessity during the COVID-19 period, as precautionary measures and lockdowns made flexible working arrangements compulsory.

Table 6

Learning Processes

Codes	Theme
Through experience	
Alongside the process	
Due to Covid-19	Learning Processes
During the pandemic period	

Participants indicate that the learning process related to flexible working did not involve prior preparation or planning; instead, it progressed through overcoming the challenges brought by the pandemic and, more importantly, through direct experience.

"We did not have such a system on our agenda before the pandemic, so we learned it during the COVID process without receiving any training; we fully integrated into the process." (K7)

"It became a part of our lives with the pandemic. Prior to this, I only knew of it as an arrangement for freelancers." (K6)

The topic of training was also evaluated by the participants during the learning process. While some emphasized that training is essential, others highlighted that adaptation could be achieved easily through a trial-and-error approach.

"All the details should be provided, and decisions should be made according to the company dynamics. There is no precise information about flexible working models. The models applied around are assumed to be flexible working." (K9)

"I don't think training is necessary; agencies are constantly adapting systems, and we can easily adapt to such changes." (K3)

"I didn't receive any training, but I don't think it's needed in the digital world anymore. Life is now more challenging for those who cannot or have not adapted." (K11)

Outcomes of Flexible Working

The fifth theme encompasses findings related to the outcomes that flexible working provides to businesses. A total of 25 codes were identified, and these codes were categorized into two groups: the advantages and disadvantages of flexible working. Participants approached the outcomes from a broad perspective, sharing insights on a range of topics, from work processes to commute times, from family relations to social interactions, and from cost reductions to the time individuals can allocate to themselves. Below are the thoughts of K3, K4, and K7 regarding the advantageous aspects of flexible working.

"I can be flexible depending on my child's situation. When work is finished, I am at home with my family. It makes planning easier for me." (K3)

"In the remote working arrangement, the time spent on commuting is eliminated, and you can adjust your working hours throughout the day according to your work situation. Additionally, there is a reduction in traffic congestion and overcrowding in public transport during working hours, which is advantageous." (K4)

"There has been a reduction in controllable and sustainable costs. The costs of logistical activities have decreased (such as kitchen, transportation, and secretarial expenses)." (K7)

Table 7

Outcomes of Flexible Working

Codes	Categories	Theme
Efficient use of time		
Cost advantage		
Traffic benefits		
Spending ample time with loved ones		
Increased work productivity		
Reduced distractions		
Emergence of new skills	Advantages	
Decrease in work-family conflict		
Partial utilization of talented individuals		
Improved family bonds		
Acquisition of new people and networks		
Learning manage anxiety		Outcomes of
Reduced resource consumption		Flexible Working
Lack of communication		
Inability to reach everyone at the same pace		
Psychological issues		
Internet Access difficulties		
Decrease in the sense of belonging		
Ineffective and incomplete training		
Absence of organizational culture	Disadvantages	
Inefficiency in rapid work		
Distrust		
Potential weakening of socialization		
Reduced knowledge exchange		
Feelings of deprivation from the team and isolation		

The disadvantages of flexible working highlight various issues such as the establishment of organizational culture, the sense of trust among employees, and the inefficiency of online meetings. Participants K1, K4, and K5 expressed the following regarding the disadvantages of flexible working:

"Is my employee truly engaged in their work? There is a sense of insecurity and a lack of control over employees who might evade their responsibilities. It will not be easy to monitor a large number of individuals in large organizations." (K1)

"The development of a sense of belonging has been hindered. Trainings have been ineffective and incomplete, and an organizational culture could not be established." (K4)

"Particularly in media planning agencies like ours, a great deal of importance is placed on ideas and projects. When a new brief is received, it is possible to quickly gather with available team members for brainstorming sessions, leading to the production of excellent work. Of course, we also conduct brainstorming sessions via Teams, but I believe that brainstorming conducted in meeting rooms is significantly more effective." (K5)

Competitive Advantage

The final theme focuses on the evaluations regarding how flexible working can provide a competitive advantage. It is emphasized that flexible working is particularly prominent in attracting qualified personnel, operating globally, and digitalization in the job preferences of the new generation.

Table 8

Competitive Advantage

Codes	Theme
FW is a determining factor for employees' preferences	
FW provides a competitive advantage	
The full office system is not widely accepted	Competitive Advantage
FW is a criterion for retaining the future workforce	

Participants' thoughts on the points where flexible working provides a competitive advantage are as follows:

"The flexibility it offers to employees is a significant criterion, as it expands the boundaries beyond their place of residence and provides opportunities to work with global firms. We are experiencing this firsthand; employees are definitely choosing companies that offer flexible working models." (K8)

"From a competitive standpoint, everything is becoming digital; even psychologists are now offering online therapy. Appointments with family doctors can now be made via Zoom, and online treatment is available in the e-Nabız system. All professions are transitioning to digital, and the era of traditional offices is coming to an end." (K3)

"In recruitment processes, many applicants prefer agencies that offer a work-from-home model. This arrangement allows for collaboration with employees from different cities. This is particularly advantageous for attracting young talents to the industry and in terms of employee costs. Certainly, it is no longer just about the salary; young people today value both flexibility and the ability to work while traveling. Perhaps one of the most important criteria for retaining Generation Z in our workforce is this."

Discussion

The study aims to understand the concept of flexible working from the perspective of media sector managers and to evaluate its practical implications. Six themes have emerged from the data, and a discussion has been presented based on the relationships between these themes and the existing literature.

Participants have evaluated the changes in work practices during the pandemic, considering both their positive and negative aspects, similarly to the findings in the literature (Açıkgöz & Mutlu, 2022; Tuna & Türkmendağ, 2020). Some studies emphasize the insufficiency of the current regulations regarding remote work and highlight the need for necessary legal adjustments (Baycık et al., 2021; Yürekli, 2020). Due to its structural characteristics, the media sector has quickly adapted to the process of flexible working; however, the uncertainties and experienced challenges during this period have contributed to the development of new talents.

The concept of flexible working has also been evaluated by participants, taking into account both its positive and negative aspects, much like the pandemic process. The majority of participants defined

flexible work as the ability to work from home, remotely, or from any desired location at any time. The perception of flexible working varies depending on the adjustment process to change and the emotional state during the transition. Those who perceive this process negatively tend to evaluate the concept through characteristics such as overtime and constant availability, often ignoring its positive aspects despite being aware of them. In contrast, those who view the concept positively describe it as an opportunity to allocate time to their families, loved ones, and themselves, while being able to perform their tasks without stepping outside their comfort zones.

Flexible working can be interpreted differently based on industry, gender, and educational background (Chung & Van der Lippe, 2020; Yıldırım, 2019; Doğan et al., 2015). For instance, a study conducted in Poland indicates that while flexible work is generally perceived positively by young employees, it also highlights negative effects such as the difficulty of separating household responsibilities from professional duties and social isolation (Beňo, 2021). Serbes (2019) emphasizes that while flexible working has a positive impact on work-life balance, this effect is insufficient, and flexible working should be further developed and tested in various forms. Therefore, there are participants who evaluate the process based on its effects on social relationships, as well as those who adopt a self-centered perspective, leading to different interpretations of the process. Furthermore, care must be taken to ensure that the flexibility provided does not turn into exploitation of labor (Belek, 2004). In this context, it is crucial that state regulations and oversight mechanisms actively work to prevent the flexibility enabled by the "Omnibus Law" from becoming a tool for employers to leverage over employees.

The findings reveal that, contrary to the literature, there is much less awareness and implementation of various flexible working types, highlighting a focus on a single type characterized by the mindset of "the best way is the one you know. In the media sector, flexible working models such as remote work, part-time work, telecommuting, job sharing, and on-call work are utilized. Participants have experienced different types of flexibility based on the course of the pandemic and the regulations implemented by the government regarding working life. However, they have gained experience primarily through trial and error rather than through a planned process or training. Working hours for media professionals are quite flexible, often resulting in the cancellation of weekend breaks and the need to pursue news until late at night (Bayram, 2015).

The fundamental characteristics of the new media sector are identified as technology, decentralization, education, and reduced costs. Particularly due to technological advancements, the necessity of being confined to a single physical location within the sector has been eliminated, leading to a significant increase in educational needs (Gürcan & Kumcuoğlu, 2017). Moreover, these developments have transformed the perception of ownership within media organizations, as the need for substantial capital has shifted towards an emphasis on knowledge and resources (Akgül & Ayer, 2018). Consequently, it is crucial to learn and systematically implement flexible working models to adapt to the rapidly evolving structure of the industry.

The aforementioned studies indicate that flexible work models are still in the early stages of experimentation in Turkey, and their implications are being evaluated from both employee and legal perspectives. Indeed, certain flexible work models are being implemented in ways that differ significantly from those described in the literature. This leads to the conclusion that, in the future, not only could new models be introduced, but existing ones might also undergo further development and transformation.

The findings reveal that flexible work was learned somewhat out of necessity during the pandemic. It has been emphasized that the process developed organically and was automatically integrated into operations. The rapid evolution of the pandemic placed both the private sector and public domain in a challenging position regarding the measures and decisions that needed to be implemented. Sectors that

are inherently flexible were able to swiftly transition to various flexible working practices.

The media sector has adapted to various types of flexible work through a trial-and-error approach, driven by the necessities of the current situation, often without a solid theoretical foundation. While this matter tends to be secondary in the public sector, the private sector—particularly qualified consulting firms—has undertaken initiatives to address the necessary steps (MindTools, Indeed, Better Up, 06.03.2024). Furthermore, participants expressed differing views on the provision of training for flexible work; one group argued for the necessity of such training, while the other contended that integration into the work environment could occur naturally over time, suggesting that additional training might be superfluous in terms of both financial and time resources.

The overall reduction in costs and the escape from heavy traffic in Istanbul are particularly highlighted as advantages of flexible working. Conversely, disadvantages such as distrust between employers and employees, weakened socialization, feelings of team deficiency, and isolation have been emphasized.

The flexible and remote working systems that gained prominence during the pandemic and were encouraged through incentive packages are likely to continue showing their positive impacts in the subsequent period (Eşsiz & Durucan, 2021). Flexible working stands out due to its benefits, such as the effective use of time spent in traffic, the ability to engage with family members, and the reduction of various expenses for employers (Dockery & Bawa, 2020; Akca & Tepe, 2020). Additionally, benefits such as the ability to respond quickly to customer needs and expectations, the prevention of waste, and increased capacity utilization also provide a competitive advantage (Çelenk & Atmaca, 2010). However, requests to come to the workplace may conflict temporally, part-time employees may not develop a sense of belonging to the organization, and administrative costs may be comparable to those of full-time employees. Communication gaps may arise for those who share jobs, and oversight may become challenging. In flexible work schedules, energy costs may increase due to prolonged operating hours, communication issues may occur with superiors, and in teleworking models, employee status can become ambiguous (Öztürkoğlu, 2013). At this point, the preference for a flexible working model should not be imposed from the top down; rather, it should involve a decision-making process centered on needs and include employees in the process, thereby maximizing benefits for both parties.

Overall, it can be stated that the concept is not fully understood, there are legal gaps, detailed information about its types is lacking, and as a result, there are challenges in the adaptation process. However, the media sector has not been as severely affected by the process as other sectors due to its flexible and continuously evolving nature, and has been able to adapt more quickly to some extent. Particularly, the shift of the sector's working environment to the digital realm has facilitated this flexibility and provided the media sector a new perspective (Demir, 2023).

In the final theme, all participants collectively emphasized that flexible working has emerged as a highly significant system in terms of competition. It is noted that the new generations entering the job market are aware of this system and are demanding to work within it. Companies that do not offer flexible work models are at risk of losing qualified talent, as the traditional system of working all day in an office is increasingly seen as less acceptable by employees. Factors such as the structural shift of the sector towards digital platforms, the transition to technology-based operations, and the growing number of freelancers contribute to the importance of flexible working in attracting and retaining qualified talent.

Conclusion and Limitations

The question of where we would be in terms of implementing flexible working if the pandemic had not occurred is a crucial point. While many countries around the world are striving to seize and learn from every opportunity to enhance productivity among employees, waiting for things to happen poses a threat in sectors characterized by high competitiveness.

On the other hand, there are perspectives that view flexibility as a political choice in search of alternative solutions to economic crises, noting that this choice shifts the burden of the crisis onto labor (Şen, 2001; Belek, 2004). At this point, as we adopt and implement the concept, we should aim for it to benefit businesses in our country, while also ensuring that it enhances employee welfare rather than adopting a populist approach.

It is evident that sector managers require comprehensive training to fully benefit from flexible working. However, some participants advocate for learning through experience, while others recognize the necessity of education. It should be understood by both groups that both theoretical knowledge and experiential learning provide an opportunity for lasting learning.

Another suggestion is that the new generation will enter the workforce with different characteristics, qualifications, and, more importantly, different expectations. One of the primary expectations of this new workforce pertains to flexible working conditions. Being knowledgeable in this area and offering job opportunities based on flexible work is crucial for attracting qualified labor.

Due to the alternative work opportunities that flexible working provides, offering different options to employees with varying personalities is essential for maximizing benefits. Therefore, to obtain greater productivity from individuals with different characteristics—such as independent workers, those who thrive in quiet environments, social workers, team players, etc.—it is necessary to understand and implement various types of alternative working arrangements.

Flexible working is gradually being implemented in our country. In this context, research can be conducted across different sectors to compare how it is perceived and evaluated in various industries. Additionally, the learning aspect of this subject presents itself as a separate issue. Investigating where and how this can be learned, as well as who could provide the necessary training, is seen as a topic that needs further exploration.

Our research, in addition to its theoretical limitations, has focused solely on managers within the context of the population-sample framework. The concept can also be evaluated from the perspective of employees. Moreover, the study did not concentrate on a specific sub-sector within the media industry. Comparisons can be made based on practices in subfields such as journalism, television, radio, and cinema.

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A Qualitative Research on the Awareness of Trend Technologies Used in Digital Transformation of Businesses Across G20 Countries

İşletmelerin Dijital Dönüşümünde Kullanılan Trend Teknolojilerin G20 Ülkeleri Genelindeki Farkındalığı Üzerine Nitel Bir Araştırma

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Abstract

Businesses that fail to adapt to the digital transformation process and the disruptive innovation that it brings are likely to lose their competitive advantage and operational efficiency. In order to adapt to this process, a digital transformation culture should prevail within the organization. Corporate culture is influenced by national culture. Therefore, the social awareness of the technologies used in businesses' digital transformation processes and the dominance of digital transformation-oriented corporate culture in businesses are related. In this context, this study aims to investigate the social awareness of globally accepted technologies in the digital transformation process of businesses in G20 countries. To this end, the study presents 19 technologies that have become known in the Industry 4.0 process through a literature review. These technologies were also categorized according to their areas of application. The study used descriptive content analysis from qualitative analysis techniques. The Google Trends database was used to determine the awareness of these technologies in the G20 countries. In this context, the average awareness data for each year and country was obtained by taking the search intensity data between 01 May 2011 and 20 December 2023 from the Google Trends database for G20 countries. This data was analysed separately for each technology. As a result of the study, the countries with the highest and lowest awareness of each technology were identified, the results were verified with the existing studies in the literature, and the points that contradicted the literature were explained. In addition, the awareness ranking of the G20 countries was revealed.

Keywords: Digital Transformation, Technology and Innovation Management, Corporate Culture.

Jel Codes: M10, M15, M19

Öz

Dijital dönüşüm sürecine ve bu süreçte kullanılan yıkıcı inovasyon etkisi yapan teknolojik gelişmelere uyum sağlayamayan işletmelerin rekabet avantajlarını ve operasyonel verimliliklerini kaybetmeleri muhtemeldir. Bu sürece uyum sağlayabilmek için dijital dönüşüme uygun olarak yapılandırılmış bir kurum kültürünün işletme içerisinde hâkim olmalıdır. Kurum kültürü ulusal kültürden etkilenen bir yapıdadır. Bu sebeple işletmelerin dijital dönüşüm sürecinde kullanılan teknolojilere olan toplum genelindeki farkındalık ile dijital dönüşüm odaklı kurum kültürünün işletmelerde hâkim olabilmesinin ilişkili olduğu düşünülmektedir. Bu kapsamda çalışmanın amacı işletmelerin dijital dönüşüm sürecinde dünya genelinde kabul görmüş teknolojilerin toplum genelindeki farkındalığını G20 ülkelerinde araştırmaktır. Bu amaç doğrultusunda Endüstri 4.0 süreci ile meşhur olmuş 19 teknoloji literatür taranarak çalışma kapsamında sunulmuştur. Bu teknolojiler kullanım alanlarına göre de kategorize edilmiştir. Çalışma kapsamında nitel analiz tekniklerinden betimleyici içerik analizinden faydalanılmıştır. Bu teknolojilerin G20 ülkelerindeki farkındalıklarını tespit edebilmek için Google Trends veritabanı kullanılmıştır. Bu kapsamda G20 ülkeleri için Google Trends veri tabanından 01 May 2011 – 20 Dec 2023 tarihleri arasındaki arama yoğunluğu verisi alınarak her bir sene için ve ülke için ortalama farkındalık verisi elde edilmiştir. Bu veriler her bir teknoloji için ayrı ayrı incelenmiştir. Çalışmanın sonucunda her bir teknoloji için farkındalığı en yüksek ve en düşük ülkeler ortaya çıkarılmış, sonuçlar literatürde var olan çalışmalarla doğrulanmış, literatür ile çelişen noktalar açıklanmıştır. Ayrıca G20 ülkeleri arasında farkındalık sıralaması ortaya çıkarılmıştır.

Anahtar Kelimeler: Dijital Dönüşüm, Teknoloji ve Yenilik Yönetimi, Kurumsal Kültür.

Jel Kodları: M10, M15, M19

A Qualitative Research on the Awareness of Trend Technologies Used in Digital Transformation of Businesses Across G20 Countries

Digital transformation initiatives in businesses accelerated after the announcement of the Industry 4.0 process in 2011. Digital transformation refers to a data and knowledge-oriented transformation that covers the processes of obtaining, storing, analysing and sharing the data and information needed by businesses with the help of technological developments (Ellström et al., 2022; Lichtenthaler, 2021; Papanagnou et al., 2022; Rogers & Zvarikova, 2021). These processes ensure that business functions such as production, human resource management and marketing are carried out more efficiently by providing data and knowledge cycles (Planing et al., 2016; World Economic Forum, 2016).

The use of technology is associated with the digital transformation process (Baraković & Baraković Husić, 2022; Daecher et al., 2018; Deloitte, 2015; Garcia-Perez et al., 2023; Mendhurwar & Mishra, 2021; Tagarev, 2019; World Economic Forum, 2016). However, it is impossible to explain digital transformation with this relationship alone (Yavaşgel & Turdubaeva, 2021). If the relationship between the digital transformation process and the use of technology alone were sufficient to explain digital transformation, the Industry 3.0 process would be ongoing (Schrauf et al., 2016). This is because the technological development that began with the Industry 3.0 process has automated businesses in a one-way fashion. One-way automation is based on sending commands from humans to machines, and the machines do the work. With the Industry 4.0 process, cooperation between humans and machines, machines and humans, and machines and machines have begun (Davies, 2015; Deloitte, 2018; Ford, 2015; Heynitz et al., 2016; Rifkin, 2014). This collaboration has led to multi-directional automation. The basic building block of this collaboration is data and the knowledge that emerges from data analysis. The ability to efficiently obtain, store, and analyse data and transform it into knowledge is based on the technology-oriented digital transformation of businesses. For this transformation to be successful, all components must be combined with a digital transformation-oriented corporate culture and awareness (Capgemini Digital Transformation Institute, 2018; Inamdar, 2022; Pavlova, 2020; Yavaşgel & Turdubaeva, 2021). Organisational culture is influenced by national culture (Khan & Smith Law, 2015; Mandal, 2022). National culture and public perception are related (Mancı, 2019; Mandal, 2022). In this context, it is essential to increase public awareness to foster a digital transformation-oriented corporate culture needed in businesses' digital transformation process.

This study investigates the social awareness of trending technologies used in the digital transformation process in G20 countries. Establishing this awareness is crucial for fostering a corporate culture that prioritises digital transformation in businesses' digital transformation processes. This approach enables insights from social awareness studies of technologies with limited societal recognition (Capgemini Digital Transformation Institute, 2018; Cherian et al., 2021; Hautala-Kankaanpää, 2022; Leal-Rodríguez et al., 2023; Pavlova, 2020; Sedliaková, 2013; Shin et al., 2023; Yavaşgel & Turdubaeva, 2021). For this purpose, 19 technologies that can be used in the digital transformation process of businesses and have become famous with the Industry 4.0 process were identified by reviewing the literature (Abbasi, 2022; Akanmu et al., 2021; Almurisi & Tadisetty, 2022; Altaf et al., 2022; Anyoha, 2017; Attaran & Celik, 2023; Balderas et al., 2021; Benotsmane et al., 2019; Cobb et al., 2018; Deloitte, 2015; Duo et al., 2022; Filipov & Vasilev, 2016; Gabriel & Pessl, 2016; Gaub, 2016; Goss, 2022; Hoske, 2015; H. C. Koch et al., 2021; V. Koch et al., 2014; Küsters et al., 2017; Liao et al., 2017; Malavasi & Gabriele, 2017; Mertes et al., 2022; Montanus, 2016; Nandhini & Lakshmanan, 2022; Nyberg & Nilsen, 2016; Pecorari, 2023; Piccarozzi et al., 2021; Prasad Agrawal, 2023; Ratten & Jones, 2023; Rifkin, 2014; Ryalat et al., 2023; Sætra, 2023; Sima et al., 2020; Tucci, 2021; Yao et al., 2017). In order to raise awareness of these technologies, they are referred to as trending technologies in this study. An attempt was made to establish a relationship between the search intensity data of trending

technologies in 18 G20 countries (Türkiye, United States of America, Germany, Argentina, Australia, Brazil, Indonesia, France, Republic of South Africa, India, Italy, Japan, Canada, Republic of Korea, Mexican, Russian Federation, Saudi Arabia, United Kingdom) (T.C. Dışişleri Bakanlığı, 2023) and the social awareness of trending technologies used in the digital transformation process of businesses (Ertürk, 2022). Since Google is banned in China (Sheehan, 2018) and the European Union within the G20 consists of many countries, it could not be included in the study. No other study in the literature examines awareness of trending technologies in the digital transformation process through search intensity data. For this reason, it is considered a contribution to the literature.

In the literature review part of this study, the digital transformation process of businesses and the trend technologies that can be used in the digital transformation process are categorised according to their application areas and presented in tables. In the methodology part of the study, trend data in the Google search engine was used to measure awareness within the borders of the G20 countries according to search intensity data on-trend technologies. The third part of the study evaluates the results of the research.

Literatur Review

Technologies such as the Internet of Things (Gilchrist, 2016; Hoske, 2015; Kovacova & Lewis, 2021) and the Internet of Behaviour (Sun et al., 2023) are used to obtain the data needed in the digital transformation process. Cloud computing resources and data storage systems are needed to store the obtained data (Cobb et al., 2018; Gilchrist, 2016; Minelli et al., 2013; Zhang, 2021). Once the data are obtained, they are analysed using software technologies (Stojanov et al., 2021; Toorajipour et al., 2021). The knowledge resulting from this analysis is shared with resources within the business, such as machinery equipment, employees, business management and resources around the business, such as suppliers, customers, and government (Davies, 2015; Deloitte, 2018; Ferber, 2013; Kuznaz et al., 2015; Langlois & Benjamin, 2017). This shared knowledge is used in decision support systems and business intelligence applications (Ahmad et al., 2020; Garcia & Pinzon, 2017; Vercellis, 2009), production processes and smart factory structures (Joppen et al., 2022; Schrauf, 2016; Shi et al., 2020), metaverse infrastructures (Bourlakis et al., 2009; Young Lee, 2021), human resources (Murugesan et al., 2023) and finance (Passi, 2015). Infrastructures such as virtual reality, augmented reality, user-friendly mobile applications and websites, and application programming interfaces (APIs) in software technologies (Amazon Web Services, 2023; Apilioğulları, 2018) make sharing and understanding knowledge easier. As a result, a data and knowledge cycle is established, facilitating vertical integration within the business and horizontal integration with the business environment (Bartodziej, 2017). All components of the horizontal and vertical integration process should be connected to a corporate culture focused on digital transformation (Wang et al., 2016, 2021).

The trending technologies that can be used to ensure the data and knowledge cycle in the digital transformation process of businesses and their areas of use in businesses are categorised in Table 1. The concept of big data, well-known in the Industry 4.0 process, is not included in this category. This is because the concept of big data is not a technology. The technologies used in the Industry 4.0 process have increased the volume (size) and variety of data. Thanks to developments in the communication infrastructure, data is quickly transmitted from the source where it is obtained to the source where it is stored. Large data sets with increased volume, diversity and acquisition speed are called big data (Cobb et al., 2018; Minelli et al., 2013).

Table 1

Trending Technologies and Their Categories

Manufacturing	Communication	Internet and Information Technologies	Data Acquisition, Analysis and Automation Technologies in Businesses
Digital Twin (DT)	Wifi v6	Web 3.0	Internet of Things (IoT)
Cobot	5G	Blockchain (BC)	Internet of Behaviours (IoB)
Cyber-Physical Systems (CPS)	LoRa Networks	Metaverse (MV)	Artificial Intelligence (AI)
Addictive Manufacturing (AM) (3D Printing)		Non-Fungible Token (NFT)	Generative Artificial Intelligence (Gen AI.)
4-D Printing		Cloud Computing (CC)	Robotic Process Automation (RPA)
			Cognitive Automation

Note: Prepared by author (Abbasi, 2022; Altaf et al., 2022; Anyoha, 2017; Attaran & Celik, 2023; Benotsmane et al., 2019; Deloitte, 2015; Duo et al., 2022; Pecorari, 2023; Piccarozzi et al., 2021; Prasad Agrawal, 2023; Ratten & Jones, 2023; Rifkin, 2014; Ryalat et al., 2023; Sætra, 2023; Schwab, 2016; Sima et al., 2020; Tucci, 2021; Yao et al., 2017)

Methodology

This research aims to investigate the awareness of trending technologies used in the digital transformation process in 18 G20 countries (Türkiye (TÜR), United States of America (USA), Germany (GER), Argentina (ARG), Australia (AUS), Brazil (BRA), Indonesia (INDO), France (FRA), South Africa (SOA), India (INDI), Italy (ITA), Japan (JAP), Canada (CAN), Republic of Korea (KOR), Mexican (MEX), Russian Federation (RUS), Saudi Arabia (SAR), United Kingdom (UK)) based on search intensity data. This study could not include the European Union and the African Union within the G20 because they include too many countries. Furthermore, China was not included in this study because access to the Google search engine is prohibited in China (Sheehan, 2018). Due to this reason, it was concluded that search intensity data for China would not be meaningful. Technologies were prioritized over countries when selecting the sample for this study. This decision was based on the lack of existing research on varying levels of technology awareness across different countries. Therefore, the study emphasized technologies known to play significant roles in the digital transformation processes of businesses. In this context, technologies that gained prominence during the Industry 4.0 process and form the foundation of digital transformation were selected using a convenience sampling method.

Content analysis, one of the qualitative research methods, was used as the analysis method. The descriptive analysis method was used within the content analysis. Descriptive content analysis was chosen because it is used to determine general trends from the studies examined on the subject under investigation (Ültay et al., 2021). The data obtained were analysed manually.

In order to understand the awareness of trending technologies in G20 countries, the study covers 152 months of Google Trends search intensity data between 01.05.2011 and 20.12.2023, the first month after the Hannover Messe, held between 4 and 8 April 2011, when the Industry 4.0 process was first announced. Search intensity data can be obtained from the Google Trends infrastructure as monthly averages for large time intervals. Once the data was obtained, the average search intensity data for each year was determined by taking the arithmetic mean of the monthly average data for that year.

Google Trends search intensity data is numbered by Google from 1 to 100 according to search interest. One indicates the lowest level of interest (awareness), and 100 indicates the highest. Google Trends divides search intensity data into topic and search criteria. Topic relevance data represents search intensity data related to the same topic, regardless of language. Due to the importance of language in search criteria data, this study only analysed the data of trending technologies that fall within the scope of the topic (Google Trends, 2023). All data collected during the study is presented in the appendices.

When evaluating the data collected within the scope of the study on 5G technology, it was understood that the search intensity data was generally formed within the scope of 5G-supported phone models and was excluded from the scope of the analysis as it was not suitable for the purpose of the study. As there is no search intensity data in the Google Trends database related to the Internet of Behaviour, Wifi v6, LoRa networks, and cognitive automation technology, these technologies are excluded from the scope of the study. As a result, meaningful search intensity data could be obtained for 14 out of the 19 selected trend technologies. The arithmetic average of all search intensity data per year is presented in the appendix. However, only the definitions and related technologies of the trend technologies that were excluded from the scope of the study are provided.

Findings and Results

This section briefly describes the relevant trending technology, related technologies, and the countries with the highest and lowest awareness according to 13-year average search intensity data. In the graph showing the countries with the "13-year average of highest and lowest awareness levels", the X-axis shows the years, and the Y-axis shows the awareness data with values between 1-100 taken from the Google Trends database. In addition, the awareness ranking of the relevant trend technology for 2023 is shown country-by-country.

Table 2

Awareness Analysis of Digital Twin Technology According to Search Data Density

Digital Twin	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Germany	Lowest Awareness: Argentina
Digital twin technology models an object in the physical world by creating its twin in the virtual world. The object's behaviour can be simulated throughout its life cycle (Akanmu et al., 2021; Attaran & Celik, 2023; Balderas et al., 2021).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT, CPS, AI, Cobot, Data Visulation		

According to the data on the search intensity of digital twin technology in the G20 countries, it can be seen that the awareness of digital twin technology has been continuously increasing since 2018. Argentina has the lowest average awareness, while Germany has the highest. The fact that Germany has the highest average awareness parallels that the Industry 4.0 process was first announced in Germany (Deloitte, 2018). According to the 2023 data, South Africa had the lowest awareness, while the USA had the highest. In 2022, Altair conducted a Digital Twinning survey of 2000 managers and engineers in the USA, France, Germany, India, Italy, China, Japan, the Republic of Korea, Spain, and the UK. According to the results of this study, the percentage of businesses using digital twin technology and planning to use it within one year parallels the awareness values for the countries with the highest awareness for 2023 in this study (Altair, 2022). Looking at the 2023 search intensity data for the digital twin, we see that all countries in the study except Argentina and South Africa have awareness levels above 50.

Table 3

Awareness Analysis of Cobot Technology According to Search Data Density

Cobot	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: USA	Lowest Awareness: Indonesia
A cobot can be defined as a robot that can work in cooperation with the worker. Cobots are used in businesses to improve quality and productivity, ensure occupational safety and take over repetitive tasks from employees (Gilchrist, 2016; Pfeiffer, 2016; Rifkin, 2014).		As there was no search intensity in Saudi Arabia, Indonesia was selected as the following country with the lowest average search intensity data.
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT AI CPS DT		

According to the data on search intensity for cobot technology in the G20 countries, the lowest average awareness was in Indonesia, and the highest average was in the USA. The next highest level of awareness after the USA was in India. The level of awareness in the USA and India is consistent with research that these two countries have the largest manufacturing sectors in the world (Biswas, 2023; Thomas, 2023). Looking at the search intensity data for cobots, all countries except South Africa, Indonesia and Saudi Arabia have an awareness score above 40.

Table 4

Awareness Analysis of CPS Technology According to Search Data Density

CPS	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: USA	Lowest Awareness: Saudi Arabia
CPS enable the integration of the cyber and physical worlds. This integration connects the cyber world to physical systems through sensors and actuators. In this way, data obtained from operational systems and business processes are combined to establish a digital ecosystem (Akanmu et al., 2021; Apilioğulları, 2018; Duo et al., 2022; Nandhini & Lakshmanan, 2022).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT AI Cobot DT		

According to the search intensity data of CPS technology across G20 countries, the lowest average awareness was in Saudi Arabia, and the highest was in the USA. It is worth noting that in Germany, the starting point of the Industry 4.0 process, the search intensity awareness in 2023 fell below 30. It can be said that CPS technology forms a kind of theoretical infrastructure of DT technology (Tao et al., 2019). For this reason, it is believed that the awareness in CPS is shifting towards DT.

Table 5

Awareness Analysis of Addictive Manufacturing Technology According to Search Data Density

Addictive Manufacturing	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: India	Lowest Awareness: Japan
Unlike traditional manufacturing technologies, production is achieved by adding raw materials rather than subtracting them. The benefits include reducing the time between product development and production, eliminating raw material waste, and reducing distribution costs and delivery times. 3D printing is also known as additive manufacturing. 3D printing includes width, length and height (Floyd et al., 2017; Julia et al., 2021; Koch et al., 2021).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT CPS AI DT Data Visulation		

According to the search intensity data for additive manufacturing (3D printing) technology across G20 countries, the lowest average awareness was in Japan, and the highest was in India. The 2023 search intensity data shows that India's high awareness continues. According to the 2023 search intensity data, awareness is above 40 in all countries except Japan. Awareness might be expected to be higher in Japan because it is the second country with the highest number of patents in this field (Epo, 2023) and the investments made (Sher, 2020).

Table 6

Awareness Analysis of 4-D Printing Technology According to Search Data Density
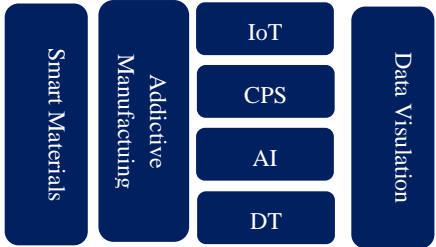
4-D Printing	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness:	Lowest Awareness:
4D printing technology enables an object to change shape in response to a stimulus. In 4D printing technology, the time dimension in which the stimulus is applied is added as a fourth dimension to the dimensions of width, length and height. The stimuli in 4D printing technology can be air, water, heat or specially designed alloys (smart materials) (Becher, 2023; Julia et al., 2021; Koch et al., 2021).	Search intensity data is not available.	Search intensity data is not available.
Related Technologies	Awareness Ranking According to Search Data in 2023	
Smart Materials, Addictive Manufacturing, IoT, CPS, AI, DT, Data Visulation	Search intensity data is not available. As 4D printing technology is not as widely used as additive manufacturing, it is assumed that there is no data.	

Table 7

Awareness Analysis of Wifi v6 Technology According to Search Data Density

Wifi v6	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness:	Lowest Awareness:
Wi-Fi v6, wireless access technology, allows more devices to be connected to the wireless access point and provides a faster communications infrastructure. Compatibility between Wi-Fi v6 and 5G allows users of these two technologies to ensure uninterrupted communications when transitioning from one to the other (Cisco Products and Services, 2021; Goss, 2022).	Search intensity data is not available.	Search intensity data is not available.
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT, 5G	Search intensity data is not available.	

Table 8

Awareness Analysis of 5G Technology According to Search Data Density

5G	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness:	Lowest Awareness:
5G describes the next generation of mobile networks with high speed, superior reliability and negligible latency. 1G introduced analogue voice, 2G introduced digital voice, 3G introduced mobile data, and 4G introduced high-speed mobile data (Goss, 2022; Mertes et al., 2022; Vargas & Tien, 2023).	Search intensity data is not available.	Search intensity data is not available.
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT Wifi v6.	Search intensity data is not available.	

Table 9

Awareness Analysis of LoRa Networks Technology According to Search Data Density

LoRa Networks	13-year average of highest and lowest awareness levels	
Definition	Highest Awareness:	Lowest Awareness:
LoRa networks are being used to address the need for reliable, low-power transmission of data collected by IoT devices over long distances as Internet of Things (IoT) applications proliferate (LoRa Alliance, 2022).	Search intensity data is not available.	Search intensity data is not available.
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT	Search intensity data is not available.	

Table 10

Awareness Analysis of Blockchain Technology According to Search Data Density

Blockchain	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Mexican	Lowest Awareness: Türkiye
Blockchain is defined as a shared, immutable digital ledger that facilitates the process of recording transactions and tracking assets in a business network. Those who own the ledger can view the data but cannot change it. If a record is incorrect, the incorrect record is not deleted, but the correct record is added. The data recorded in the ledger are called blocks (Altaf et al., 2022; Pal & Yasar, 2020).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
MV NFT IoT Web 3.0		

According to search intensity data across G20 countries provided by Google Trends, there is almost no awareness of blockchain technologies as of 2021. The lowest average awareness is in Türkiye, and the highest is in Mexican. However, blockchain awareness is almost nonexistent in the 2023 search intensity data except in Mexican, Saudi Arabia and Argentina. It is less than 1 in these three countries. There may be conceptual complexity in society regarding Blockchain technology and the concept of the cryptocurrency bitcoin, which was developed using Blockchain technology as its foundation.

Table 11

Awareness Analysis of Web 3.0 Technology According to Search Data Density

Web 3.0	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: France	Lowest Awareness: Türkiye
Web 3.0 technology differs from the previous WWW (World Wide Web) technologies. Web 3.0 is based not on sharing content by storing it in centralised resources but on sharing it using blockchain technologies in a distributed architecture. In Web 1.0, content was shared unidirectionally from the server to the user. In Web 2.0, two-way sharing between users and content producers emerged. In other words, interaction between users and content producers was born. In Web 3.0, content is not stored on central servers but between those with blockchain infrastructure and Web 3.0 applications (Kapan & Üncel, 2020).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
MV NFT BC WWW		

According to the search intensity data for Web 3.0 technology across G20 countries, Türkiye has the lowest average awareness, and France has the highest average. According to the 2023 search intensity data, the highest average awareness is in France. It is evident that France is actively pursuing studies on Web 3.0 technologies, particularly through startup entrepreneurs. Notably, at Station F, a campus dedicated to startups, more than 1500 startups are active simultaneously. (Station F, 2023).

Table 12

Awareness Analysis of Metaverse Technology According to Search Data Density

Metaverse	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Republic of Korea	Lowest Awareness: Türkiye
Metaverse is used to express the structure in which a copy of objects in the physical world is represented in a virtual environment. Objects in this definition can include all kinds of objects such as people, cars, animals, houses, works of art, etc. (Abbasi, 2022; Lee et al.) Metaverse uses virtual reality and augmented reality technologies (Abbasi, 2022; Lee et al., 2021).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
BC NFT Web 3.0		

According to the search intensity data of Metaverse technology across G20 countries, the lowest average awareness was in Türkiye, and the highest average awareness was in the Republic of Korea. It is thought that the reason for the high awareness in the Republic of Korea is that the Republic of Korea announced in 2021 that the studies on the Metaverse should be supported by state policies and carried out studies in this field (Koçak, 2016; Kurtuluş & Tekin, 2023). It is thought that necessary state policies should be produced to increase the awareness of new technologies among businesses and society.

Table 13

Awareness Analysis of NFT Technology According to Search Data Density

NFT	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Japan	Lowest Awareness: Brazil
NFTs can be defined as the technology that enables the price regulation of objects in the virtual world with proof of ownership. The main link between the metaverse and NFTs is digital assets and how they are valued. While the metaverse allows digital forms of art and property to be displayed, NFTs allow this content to be priced with proof of ownership (Abbasi, 2022).		
Related Technologies	13-Year Average Of Highest And Lowest Awareness Levels	
BC MV Web 3.0		

According to the data on the search intensity of NFT technology in the G20 countries, the lowest average awareness occurred in Brazil, and the highest average awareness occurred in Japan. Web 3.0 is associated with Metaverse and NFT. Web 3.0 is the technological infrastructure of Metaverse and NFT. Awareness of Metaverse and NFT is parallel. The high awareness of both Metaverse and NFT technologies in the Republic of Korea and Japan is believed to be largely due to awareness campaigns facilitated by government policies (Koçak, 2016).

Table 14

Awareness Analysis of Cloud Computing Technology According to Search Data Density

Cloud Computing	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: USA	Lowest Awareness: Türkiye
Cloud computing is the virtualisation of information technology resources such as processors, RAM, disk capacity and bandwidth that businesses need and can use from anywhere. The focus is on using the resources, not managing them. Businesses can establish a cloud computing infrastructure using their local facilities or procure necessary resources by purchasing services from cloud computing service providers. In general, there are three different types of cloud computing services: SaaS (Service as a Software), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service) (Almurisi & Tadisetty, 2022; Golightly et al., 2022; IBM, 2016; Taleb & Mohamed, 2020).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
CPS IoT Gen AI. AI NFT MV Web 3.0 BC Virtualization Data Storage		

According to the search intensity data for cloud computing technology across G20 countries, Türkiye has the lowest average awareness, and the USA has the highest average. It is noteworthy that Türkiye has the lowest average density data. This is because Türkiye is one of the leading countries in cloud computing, especially in the public sector. It is one of the world's leading countries in e-government. In this context, it can be seen that there is a contradiction between Türkiye's awareness rate in the research and the studies conducted in the field of cloud computing in Türkiye (T.C. Cumhurbaşkanlığı Dijital

Dönüşüm Ofisi, 2022). However, more than 51% of the more than 10,000 businesses established in Technoparks under the auspices of the Ministry of Industry and Technology of the Republic of Türkiye work in the field of software. The software developed in the Technoparks is generally operated with cloud computing architecture (T.C. Sanayi ve Teknoloji Bakanlığı Ar-Ge Teşvikleri Genel Müdürlüğü, 2023). Evaluated in this context, it is believed that the digital transformation-oriented corporate culture that businesses need in digital transformation can be more easily achieved if efforts are made to increase the awareness of cloud computing technologies among society and employees in Türkiye.

Table 15

Awareness Analysis of IoT Technology According to Search Data Density

IoT	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Canada	Lowest Awareness: Türkiye
IoT is about all kinds of objects, such as computers, phones, machines, sensors, people, animals, etc., sending data to the network. Analysis of this data provides knowledge that many systems can use. IoT is one of the most fundamental building blocks for obtaining data through digital systems (Abdulkareem et al., 2021; Albert, 2015; Duo et al., 2022; Villamil et al., 2020).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
CPS · DT · Gen AI. · AI · AM · Cobot		

According to data on the search intensity of IoT technologies in G20 countries, Türkiye has the lowest average awareness, and Canada has the highest average awareness. Anadolu Agency, the official news agency of the Republic of Türkiye, reported that 81% of Turkish businesses use IoT technology, based on a survey conducted by cybersecurity business Kaspersky on the cybersecurity of IoT systems (Yanık, 2020). In addition, IoT in Türkiye is making its way into households, especially in the white goods sector (Arçelik, 2022; Vestel, 2022). These data and the research results are contradictory with regard

to Turkish data. In this context, it can be said that the society in Türkiye uses IOT technologies but has a low awareness of the technology they use.

Table 16

Awareness Analysis of IoB Technology According to Search Data Density
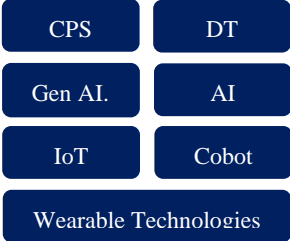
IoB	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness:	Lowest Awareness:
It is about capturing human behaviour as data and transferring that data to information systems. By analysing these data, decisions can be made more efficiently about the psychological state of employees in the work environment and processes related to the way they do business (Duo et al., 2022; Gills, 2022; Sun et al., 2023). Within the scope of the Industry 5.0 process, the Internet of Behaviour is considered to be an essential focal point in this period, as it attempts to explain the cooperation between employees and technology (European Commission, 2022; Grabowska et al., 2022; Xu et al., 2021).	Search intensity data is not available.	Search intensity data is not available.
Related Technologies	Awareness Ranking According to Search Data in 2023	
CPS DT Gen AI. AI IoT Cobot Wearable Technologies	Search intensity data is not available.	

Table 17

Awareness Analysis of Artificial Intelligence Technology According to Search Data Density

Artificial Intelligence	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Italy	Lowest Awareness: Saudi Arabia
The literature defines intelligence as a force encompassing personal activities such as learning, reasoning and understanding. Artificial intelligence is defined as a metaphor because machine learning, reasoning, and decision-making processes are similar to human intelligence. There are three types of artificial intelligence (Anyoha, 2017; Cannataro et al., 2022; Enholm et al., 2022; Korteling et al., 2021). Today, it is possible to see artificial intelligence-based software in many areas, such as autonomous vehicles, personal assistants, content generation software, decision support systems, financial tools and health applications.		
Related Technologies	Awareness Ranking According to Search Data in 2023	
IoT IoB CPS DT RPA CC CO		

According to the data on search intensity for artificial intelligence technology in the G20 countries, the lowest average awareness was in Saudi Arabia, and the highest was in Italy. However, when the year 2023 is evaluated, it is seen that the awareness of all G20 countries within the scope of the study is

above 60. It can be said that technologies related to artificial intelligence have a high level of awareness throughout society. This awareness is valuable considering that studies on artificial intelligence have affected many areas in the public and private sectors (Azadi Moghadam et al., 2024; Colbran & Toker, 2023; T.C. Cumhurbaşkanlığı Dijital Dönüşüm Ofisi, 2021; Currie, 2023; Lv, 2023; Ratten & Jones, 2023; Saenkhum & Kim, 2023; Sikka et al., 2022).

Table 18

Awareness Analysis of Generative Artificial Intelligence Technology According to Search Data Density

Generative Artificial Intelligence	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: South Africa	Lowest Awareness: Japan
Generative artificial intelligence refers to a type of AI capable of independently producing new content, including text, images, audio, and video (Lv, 2023).		
Related Technologies	Awareness Ranking According to Search Data in 2023	
CC AI		

According to the data on search intensity of generative artificial intelligence technology across G20 countries, Japan has the lowest average awareness, and South Africa has the highest average awareness. However, while South Africa's awareness will not change by 2023, the awareness of other countries will increase significantly. It can be said that the free use of generative artificial intelligence applications such as Chat-GPT for the use of society has increased the interest in generative artificial intelligence. The continuous expansion of the applications of generative artificial intelligence is in line with the findings of this study. (Eke, 2023; McKinsey, 2023; Moorhouse et al., 2023).

Table 19

Awareness Analysis of Robotic Process Automation Technology According to Search Data Density

Robotic Process Automation	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness: Brazil	Lowest Awareness: Russia
It is a technology that automates routine business processes that humans perform, such as queries, calculations, record creation, and updating (Tucci, 2021). Traditional robotic process automation technologies can work with structured data (Lawton, 2021b). The business processes taken over by robotic process automation have attempted to be described by the concept of hyper-automation, according to Gartner in 2019. Hyperautomation can also be defined as the digital twin of business processes.		
Related Technologies	Awareness Ranking According to Search Data in 2023	
Gen AI. AI		

According to the search intensity data for robotic process automation technology across the G20 countries, Russia has the lowest average awareness, and Brazil has the highest average. While Brazil's awareness is noteworthy, awareness is above 40 in all G20 countries except Indonesia and Japan. This result is valuable. This is because robotic process automation technologies are now being used in businesses to automate business processes (Lawton, 2021a, 2021b; Rogers & Zvarikova, 2021; Tucci, 2021).

Table 20

Awareness Analysis of Cognitive Automation Technology According to Search Data Density

Cognitive Automation	13-Year Average of Highest and Lowest Awareness Levels	
Definition	Highest Awareness:	Lowest Awareness:
Cognitive automation is described as a technology that combines artificial intelligence and process automation capabilities to make the results of a job more efficient. While traditional robotic process automation only works with structured data, cognitive automation can also analyse unstructured data from emails, phone calls and videos. Cognitive automation systems are more challenging to manage than robotic process automation (Lawton, 2021b).	Search intensity datais not available.	Search intensity datais not available.
Related Technologies	Awareness Ranking According to Search Data in 2023	
RPA AI Gen AI.	Search intensity datais not available.	

Conclusion and Evaluation

Digital transformation has affected many institutions, from the private to the public. In a world that is globalised in many ways, distances between people have virtually disappeared. In other words, the virtual world has generated a digital twin of various objects, including people, goods, food, and more. These digital twins have led to many innovations in trade and human relations. A trade item sold at one end of the world can be examined in great detail from the other end of the world. These items can be tried virtually in some sectors, such as clothing. Such changes are called disruptive innovation (Güleç, 2020). Businesses must be aware of this issue during disruptive innovation (Bilge, 2017). For all business stakeholders to adopt a digital transformation-oriented corporate culture, barriers to digital transformation within the business must be removed. One of these is the corporate culture barrier unrelated to digital transformation (Güvener, 2019). The corporate culture barrier consists of the resistance of employees within the business to change. This resistance consists of a corporate culture that does not refer to digital transformation. In order to remove this barrier, the corporate culture must be transformed into a corporate culture that refers to digital transformation. One of the components that influence corporate culture is national culture. National culture is also related to public awareness (Adel, 2022; Capgemini Digital Transformation Institute, 2018; Cherian et al., 2021; Didonato & Gill, 2015; Khan & Smith Law, 2015; Mandal, 2022; Moraes & Lepikson, 2017; Özutku, 2019). Although it is challenging to determine society's awareness fully, Google Trends data is an important database where search intensity data is stored to shed light on awareness in this context (Bredenoord, 2016).

As part of the study, the Google Trends database was analysed concerning 2011 - 2023 (01.05.2023 - 20.12.2023) to contribute to creating a corporate culture in the digital transformation process in businesses in 18 G20 countries. The research looked at trend technologies in four categories: manufacturing, communications, internet and information technologies and data collection, analysis and automation technologies. There is insufficient search intensity data in the Google Trends database for 5G, Wifi v6 and LoRa networks among the selected trend technologies in the communications category.

When analysing the search intensity data in the field of manufacturing, it can be seen that the USA, Germany and India have a high level of social awareness.

When analysing the search intensity data in the field of Internet and technologies, it can be seen that the social awareness of the USA, Japan, the Republic of Korea and France is high. In the search intensity data in the field of Internet and technologies, the awareness of blockchain technology in 2021 is below 1 for all countries. This result shows that awareness has not increased at all. Blockchain technology forms the infrastructure of digital currencies (such as Bitcoin, Ethereum, and digital Turkish lira), also used in the metaverse (Altaf et al., 2022). It is assumed that the reason for the negligible social awareness of this topic is that societies are more interested in technologies such as the metaverse and digital money, which are brought about by technological infrastructure, than in the technological infrastructure related to this topic.

An analysis of the search intensity data for data collection, analysis and automation technologies shows that Canada, Italy, South Africa and Brazil have a high level of awareness. The Internet of Behaviours and cognitive automation technologies could not be collected as no topic exists in the Google Trends infrastructure. In particular, the concept of the Internet of Behaviours is important in terms of collaboration between employees and technology in the Industry 5.0 process. It is important for businesses to get instant data from employees, as in IoT technology, to analyse their attitudes and reveal their tacit knowledge instantly.

Analysing the average search intensity data for the years 2011-2023, the ranking of awareness of trending technologies for the G20 countries is shown in Figure 1. Analysing this ranking, we see that the USA has the highest awareness and Indonesia has the lowest. When analysing the values in the awareness ranking, it can be seen that there is a difference of about two times between the highest awareness and the lowest awareness. It is natural for the USA, the world's largest economy, to have the highest average awareness, especially with its technological development.

Figure 1

Average Search Intensity Graph of Trending Technologies Across G20 Countries for the Period 2011-2023
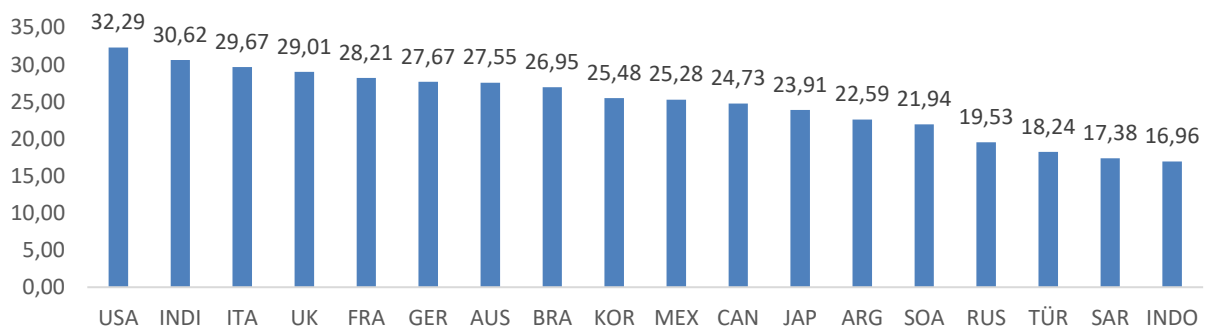
Note. The X-axis shows the G20 countries, and the Y-axis shows the awareness data with values between 1-100 taken from the Google Trends database

The awareness ranking of the trending technologies in the study according to the average search intensity data for 2023 is also shown in Figure 2. This chart shows that India has the highest awareness with 57.72, and South Africa has the lowest awareness with 33.08. According to the average of the 13-year data in Figure 1, the USA, which is ranked first, has dropped to seventh place for 2023. According to the data in Figure 2, the awareness of all countries is above 30. According to the same chart, India, Brazil, Italy, Canada, the United Kingdom, the United States, Germany and France will be among the ten largest economies in the world (IMF, 2023).

Figure 2

Average Search Intensity Graph of Trending Technologies Across G20 Countries for 2023
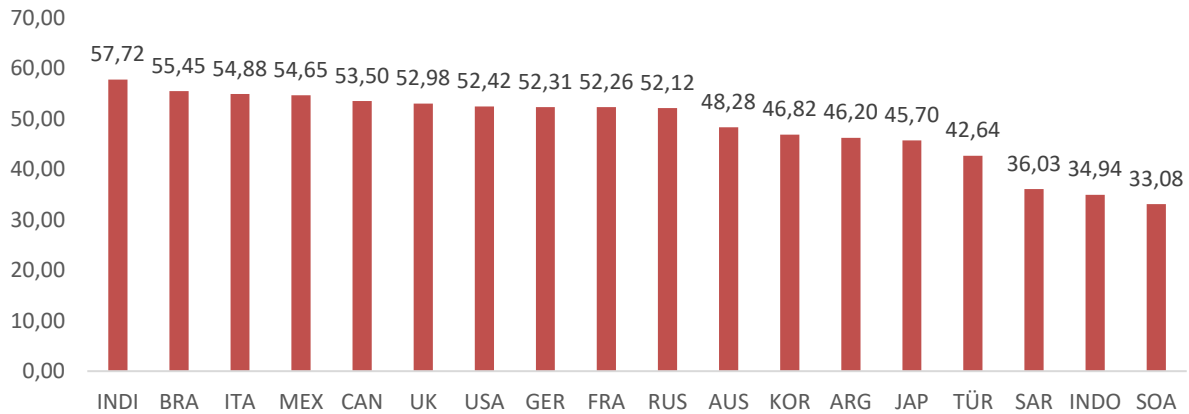
Note. The X-axis shows the G20 countries, and the Y-axis shows the awareness data with values between 1-100 taken from the Google Trends database

In order to increase social awareness of the technologies used in digital transformation processes, policies should first be developed at the state level. When developing policies, it may be more appropriate to listen to the advice of expert committees in the field.

Starting with primary education, curricula at all levels should be structured to cover new technologies.

Activities can be conducted to foster technological awareness in society. One such initiative is the Teknofest event organized in Türkiye. This event aims to engage young people in the domestic development of global technologies (Altuğ & Akkoyun, 2023).

As a result, this study attempted to identify the social awareness of trending technologies in order to develop a corporate culture that supports digital transformation in businesses' digital transformation processes. This awareness is essential in shaping the national culture and the corporate culture concerning digital transformation (Levin & Mamlok, 2021). Every individual in society who is fit for work is a potential employee for businesses. Raising awareness of trend technologies among potential employees is believed to significantly contribute to creating a corporate culture that is needed by businesses, and that takes digital transformation as a reference. However, studies on awareness of trend technologies should be evaluated country-by-country. The cultural structure of each country is different. Studies conducted in different countries can also be adapted to the cultural structure.

Compliance with Ethical Standards

Ethical Approval

It was declared by the author that the tools and methods used in the study do not require the permission of the Ethics Committee. It was declared by the author that scientific and ethical principles have been followed in this study and all the sources used have been properly cited.

Author Contributions

The author confirms the sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

Declaration of Conflicting Interests

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Appendix

Table A1

Arithmetic Mean of Awareness of Trending Technologies in G20 Countries Over the Period 01 May 2011 – 20 Dec 2023

Techs	SAR	GER	USA	ARG	AUS	BRA	INDO	FRA	INDI	UK	ITA	JAP	CAN	KOR	MEX	RUS	SOA	TÜR
DT	14,69	29,41	25,19	13,15	20,35	20,57	22,75	19,47	26,72	22,21	19,12	23,87	19,54	24,06	19,57	18,13	16,15	16,57
CB	0,00	36,84	38,27	16,97	25,02	30,85	4,60	38,73	35,05	34,94	29,43	24,96	29,53	15,67	23,90	21,61	9,05	21,26
CPS	3,29	37,50	58,46	9,63	19,87	16,49	6,99	23,36	37,81	29,07	29,19	29,70	20,91	27,00	20,87	16,07	6,60	17,89
AM	46,09	41,22	43,04	37,91	52,90	53,92	35,85	34,07	71,39	45,20	37,64	24,34	42,94	63,89	41,66	28,97	53,07	38,40
BC	10,80	10,36	8,51	11,93	7,50	11,76	13,77	12,62	11,63	10,46	10,76	11,62	8,06	9,93	14,11	10,21	11,26	7,05
Web 3.0	10,08	17,70	11,21	29,58	12,26	26,70	16,93	36,70	15,61	10,04	27,71	7,79	12,13	9,71	33,27	18,65	16,58	4,64
MV	8,08	6,56	5,65	6,54	5,00	5,94	3,95	7,91	4,73	6,82	7,12	8,57	5,29	9,46	6,74	5,02	7,23	2,74
NFT	5,34	4,43	4,81	5,37	4,65	3,30	1,98	5,30	4,59	4,92	4,21	10,27	4,39	6,78	3,69	6,94	4,39	6,86
CC	37,20	50,18	75,44	30,08	66,13	47,66	28,47	59,47	66,38	67,71	40,30	50,69	57,51	37,72	47,88	45,17	56,94	26,05
IOT	14,83	47,11	51,77	52,43	49,44	51,65	30,34	51,12	47,40	55,58	67,71	43,16	43,62	45,85	34,88	33,50	24,37	11,37
BD	45,19	54,62	62,21	32,76	54,32	27,98	27,31	36,29	48,10	58,54	51,67	42,35	59,40	58,11	46,94	26,34	48,22	51,74
AI	9,96	14,44	13,34	11,80	14,58	17,96	12,54	14,20	13,85	13,01	42,65	25,55	12,57	20,37	11,29	16,46	12,30	12,54
Gen. AI	5,80	4,96	4,73	5,46	5,05	4,21	4,23	3,84	4,36	4,58	4,09	2,67	4,60	3,43	5,09	4,13	6,21	5,44
RPA	31,98	31,99	49,45	52,67	48,66	58,26	27,69	51,81	41,04	43,12	43,85	29,14	25,79	24,80	44,06	22,24	34,79	32,74
Average	17,38	27,67	32,29	22,59	27,55	26,95	16,96	28,21	30,62	29,01	29,67	23,91	24,73	25,48	25,28	19,53	21,94	18,24

Table A2

01.05.2011 – 20.12.2023 Average Awareness of DT Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	0,88	9,75	0,00	1,63	1,88	0,25	14,13	2,13	7,88	20,13	1,63	0,00	0,75	19,63	4,13	8,25	0,00	2,25	2,25
2012	1,00	13,75	2,08	3,58	0,50	0,25	7,67	0,33	7,33	11,92	3,08	0,25	1,25	0,00	2,92	22,08	0,00	3,67	1,17
2013	1,38	12,25	2,63	4,75	1,75	0,38	4,63	0,63	4,50	5,38	1,75	1,13	0,00	14,00	0,50	9,75	4,50	3,75	2,00
2014	0,58	0,00	1,67	3,00	0,50	2,75	2,08	0,25	3,67	6,00	3,25	0,17	1,83	1,17	0,83	6,25	0,00	2,92	1,83
2015	1,92	7,00	0,00	1,33	0,33	16,58	2,50	2,08	1,67	1,75	2,75	1,75	0,67	6,42	1,08	12,25	0,00	2,33	1,42
2016	3,75	4,25	2,08	4,67	1,25	4,50	5,58	1,25	5,08	3,58	1,08	2,67	1,50	4,17	0,67	4,92	5,17	2,42	1,92
2017	10,58	11,25	5,17	6,58	3,42	2,50	9,92	6,42	15,67	8,67	2,17	6,83	5,67	6,83	3,08	7,83	6,00	6,08	7,25
2018	16,42	5,08	11,00	12,58	12,83	6,50	27,25	13,00	22,58	17,25	9,42	16,42	17,92	11,33	3,17	9,67	5,25	7,08	15,17
2019	27,00	14,58	26,33	20,17	19,00	13,75	42,58	21,25	30,67	19,67	16,92	25,75	28,83	24,25	19,00	22,42	17,33	18,08	27,17
2020	34,83	9,33	32,58	35,58	24,83	19,58	41,33	28,58	41,33	43,92	22,58	41,50	35,83	27,67	29,83	16,50	18,00	23,42	33,17
2021	50,42	15,42	40,50	27,50	37,50	43,67	60,00	39,42	46,75	47,67	34,75	51,42	54,75	30,50	39,42	19,58	19,83	25,83	42,25
2022	86,92	27,00	72,33	67,75	70,67	38,75	78,92	60,58	77,58	52,58	65,50	80,50	82,42	45,75	61,67	36,00	47,75	47,25	70,17
2023	91,75	41,25	68,17	78,33	79,58	64,58	85,75	77,42	82,67	57,25	83,67	81,92	81,42	62,67	69,42	34,50	67,17	70,33	82,92

Table A3

01.05.2011 – 20.12.2023 Average Awareness of Cobot Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	17,38	15,25	13,12	12,62	12,25	0,00	1,62	12,12	19,37	4,00	21,87	7,75	11,75	3,12	17,25	7,875	0,00	25,5	9,25
2012	14,83	4,58	14,33	26,17	5,58	0,00	5,92	15,33	7,58	4,08	7,17	9,92	17,00	11,00	15,92	0,00	0,00	5,58	10,58
2013	16,92	10,17	15,67	27,33	15,75	0,25	12,63	9,25	17,58	4,42	7,33	9,50	18,17	9,92	11,08	8,83	0,00	12,75	11,67
2014	20,83	12,00	14,67	28,75	22,83	3,92	19,17	10,58	11,50	3,50	11,08	7,58	0,00	15,92	5,75	6,58	0,00	10,33	18,92
2015	30,33	7,58	13,33	18,08	22,33	8,33	39,50	21,83	21,00	2,25	9,08	8,25	2,33	15,25	5,25	0,00	0,00	6,75	23,83
2016	29,75	15,58	23,58	33,75	18,83	4,33	61,17	37,08	20,25	2,00	13,42	9,50	7,42	6,75	1,33	10,08	0,00	13,58	23,50
2017	31,17	24,17	25,58	22,92	19,00	6,58	83,83	59,08	23,58	1,58	18,00	3,25	0,00	7,33	3,92	3,08	0,00	14,00	36,50
2018	41,08	10,33	13,00	39,75	27,58	0,58	83,42	66,75	35,08	2,00	27,67	15,58	21,75	20,00	13,50	13,25	0,00	25,92	38,83
2019	47,25	8,42	28,67	24,92	36,42	5,17	76,75	53,58	43,50	2,25	40,00	30,83	24,42	25,33	29,58	16,00	0,00	23,25	49,83
2020	47,58	23,58	32,58	28,33	42,75	2,08	59,83	40,00	61,75	4,42	40,58	41,50	12,42	38,17	32,17	17,33	0,00	23,08	63,25
2021	51,42	26,25	28,00	43,92	39,58	1,83	53,25	45,08	52,17	19,75	55,00	50,75	16,33	43,58	32,17	14,50	0,00	33,17	44,00
2022	66,08	29,67	49,25	42,75	51,83	7,00	56,17	60,00	64,33	6,25	59,58	57,92	21,00	53,50	51,33	9,33	0,00	39,83	54,08
2023	82,92	33,00	53,42	51,75	69,17	3,83	55,50	72,75	78,00	3,25	71,83	72,17	51,17	60,83	61,67	10,75	0,00	42,67	70,00

Table A4

01.05.2011 – 20.12.2023 Average Awareness of CPS Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	47,88	24,75	9,13	4,50	6,88	0,50	9,63	11,25	12,25	5,25	17,00	11,38	9,25	23,75	7,63	19,88	16,75	3,88	5,75
2012	38,33	5,67	5,75	2,92	7,67	0,50	11,17	16,08	16,00	15,17	5,67	4,33	3,00	10,92	2,42	16,58	0,67	18,42	7,00
2013	63,13	18,50	24,13	6,75	7,88	1,13	27,13	14,88	33,13	8,50	30,63	5,50	18,88	9,25	0,00	4,25	2,00	14,75	11,50
2014	55,00	2,92	15,50	4,58	6,08	3,00	24,75	17,58	29,75	0,00	22,58	3,08	6,42	9,42	6,58	2,75	0,00	5,42	11,25
2015	56,25	0,00	9,42	5,58	19,50	18,58	33,75	10,83	21,75	1,50	14,75	7,75	8,33	11,17	4,17	7,08	3,75	3,50	26,92
2016	64,25	8,42	14,75	6,25	15,00	6,67	37,83	26,67	27,50	0,50	16,67	14,75	12,58	10,92	8,25	3,08	2,08	19,92	31,33
2017	70,17	2,50	9,92	14,25	16,17	8,58	47,08	26,33	43,92	2,33	38,17	57,67	30,67	9,67	12,08	3,67	2,17	7,25	41,75
2018	61,58	4,33	27,67	20,08	23,25	5,58	48,83	17,00	40,17	5,00	48,67	63,42	55,83	16,58	10,42	1,17	1,75	18,83	34,00
2019	64,50	13,25	30,58	18,92	33,50	5,50	58,42	25,25	40,58	10,00	36,00	56,00	42,42	21,50	17,83	8,67	1,83	14,75	37,58
2020	52,83	9,17	26,08	32,92	18,58	5,67	58,42	35,58	42,00	8,67	26,58	41,25	49,25	26,67	19,08	6,67	1,50	32,17	34,42
2021	45,83	13,50	10,67	23,33	32,58	4,83	66,75	34,83	47,50	7,00	34,25	55,00	54,42	26,25	34,00	3,83	3,00	29,83	28,92
2022	70,92	12,67	32,83	35,08	44,25	4,25	36,50	30,67	73,75	14,00	48,75	37,75	51,92	49,75	38,42	2,75	3,50	35,33	60,17
2023	69,25	9,50	41,83	39,25	40,50	4,00	28,58	36,75	63,25	13,00	39,75	28,25	8,08	45,50	48,00	5,42	16,75	28,50	47,33

Table A5

01.05.2011 – 20.12.2023 Average Awareness of AM Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	7,50	2,13	9,63	9,25	8,13	1,25	4,88	2,38	18,13	8,25	4,13	2,88	5,38	4,38	4,38	13,25	8,25	3,75	8,00
2012	12,00	4,50	17,50	13,17	12,50	7,33	8,67	6,00	20,17	9,50	8,67	5,00	7,58	7,50	4,08	19,33	6,83	5,75	16,67
2013	52,50	18,25	63,63	74,00	49,13	45,00	45,88	38,75	87,50	42,75	36,75	21,50	78,25	31,00	17,38	72,75	27,63	24,00	58,38
2014	37,17	16,92	43,58	45,25	35,92	32,67	29,17	33,25	77,25	27,75	51,75	14,92	76,58	28,92	11,25	54,50	29,83	22,58	38,83
2015	40,58	23,75	54,08	45,83	39,33	59,25	32,17	31,83	88,83	36,08	40,92	13,00	84,58	35,42	11,25	52,75	42,83	28,67	47,00
2016	34,58	22,08	48,17	42,00	34,58	52,08	33,50	34,08	77,42	25,67	36,17	22,92	71,50	33,67	19,08	40,42	42,92	28,67	37,67
2017	40,42	32,00	52,58	51,25	40,17	47,42	40,83	36,42	72,42	26,17	39,67	81,25	75,58	41,75	73,75	45,33	46,25	35,92	41,50
2018	45,42	38,08	57,92	61,92	46,75	50,42	45,83	41,00	77,17	37,67	41,33	80,25	80,33	45,75	74,75	57,50	54,58	51,17	45,50
2019	44,50	48,33	54,33	61,75	46,58	45,67	51,33	41,08	71,92	58,67	38,83	9,58	59,00	54,92	22,58	59,33	58,92	47,67	45,67
2020	53,00	55,33	64,00	67,75	56,33	51,92	61,92	53,33	84,58	54,42	49,50	11,50	75,50	55,17	21,67	68,25	64,42	68,17	61,08
2021	55,33	67,67	59,58	64,92	51,83	61,17	52,92	44,83	84,42	55,25	45,25	15,00	68,83	51,92	29,83	59,17	62,08	54,50	53,92
2022	64,33	84,58	76,83	80,08	64,17	59,25	57,42	45,58	82,58	42,83	47,67	18,67	66,50	72,08	42,58	75,25	74,83	55,58	64,67
2023	72,17	79,25	85,83	83,83	72,83	59,92	72,08	47,25	85,67	41,08	48,75	20,00	80,92	79,17	44,00	72,08	79,83	72,75	68,67

Table A6

01.05.2011 – 20.12.2023 Average Awareness of BC Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	0,00	0,38	0,38	0,00	0,00	0,00	0,00	0,00	0,13	4,00	0,13	0,00	0,38	0,63	0,00	0,25	1,38	0,00	0,13
2012	0,00	0,92	0,08	0,00	0,00	0,00	0,00	0,00	0,08	0,17	0,17	0,00	0,00	0,00	0,00	0,83	1,17	0,17	0,00
2013	0,00	0,38	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,25	0,13	0,00	0,13	0,25	0,00	1,00	0,00	0,00	0,00
2014	0,00	0,08	0,00	0,08	0,00	0,08	0,00	0,00	0,00	0,08	0,08	0,00	0,00	0,42	0,00	0,17	0,50	0,00	0,00
2015	0,00	0,17	0,00	0,00	0,00	0,92	0,00	0,00	0,00	0,17	0,00	0,00	0,00	0,08	0,00	0,50	1,42	0,00	0,00
2016	1,67	1,67	1,75	2,75	1,75	2,42	2,75	4,42	2,92	2,58	2,08	4,08	1,58	2,33	2,00	4,08	1,42	1,08	3,00
2017	32,42	38,42	32,25	45,33	32,75	22,83	43,67	47,67	44,50	39,17	34,75	39,83	24,58	44,58	48,50	43,67	34,50	30,67	41,58
2018	47,17	58,33	39,58	46,75	44,17	61,50	51,58	60,75	57,92	60,92	51,50	61,67	61,58	71,33	47,58	52,75	52,83	32,33	54,33
2019	24,67	43,33	19,58	50,17	21,58	28,75	30,33	41,83	37,08	59,33	43,08	38,08	35,50	52,00	29,42	35,50	37,25	21,75	30,42
2020	4,67	10,50	3,92	7,75	4,50	4,75	6,33	9,33	8,58	12,25	8,00	7,42	5,33	11,08	5,17	7,25	9,00	5,58	6,58
2021	0,00	0,67	0,00	0,00	0,00	0,25	0,00	0,00	0,00	0,08	0,00	0,00	0,00	0,50	0,00	0,33	0,42	0,08	0,00
2022	0,00	0,17	0,00	0,00	0,00	0,08	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,00
2023	0,00	0,08	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,25	0,00	0,00	0,25	0,00	0,00

Table A7

01.05.2011 – 20.12.2023 Average Awareness of Web 3.0 Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	14,13	44,00	18,88	41,63	16,63	2,25	28,38	24,75	30,88	37,25	29,88	5,63	5,25	24,88	25,75	17,75	12,63	3,00	10,13
2012	10,00	36,17	14,92	38,83	11,92	1,17	26,17	23,17	22,00	20,17	31,08	3,58	4,83	29,83	20,42	34,83	3,33	2,25	10,17
2013	13,25	41,50	13,38	42,63	15,50	1,88	31,13	29,38	24,63	37,13	48,75	2,25	8,63	47,88	26,50	24,50	14,63	3,25	11,13
2014	8,50	22,08	8,83	20,42	6,33	1,25	14,92	20,08	11,17	15,83	28,08	2,17	5,08	28,67	11,17	15,67	3,92	1,42	6,75
2015	7,08	21,33	7,00	16,83	7,67	8,42	14,17	33,67	8,50	10,33	26,75	1,75	3,33	29,33	5,50	10,33	6,83	0,83	5,42
2016	3,42	20,75	6,17	14,67	4,58	12,92	8,67	48,17	4,83	7,08	24,75	1,58	2,83	26,08	7,75	1,75	7,83	0,92	2,92
2017	1,50	38,92	1,67	23,50	2,42	1,42	3,67	62,33	1,17	2,33	40,92	1,17	1,58	47,92	3,50	1,00	1,50	0,58	1,08
2018	3,58	18,25	4,33	10,33	4,42	0,42	5,58	41,00	2,58	5,67	18,17	1,92	1,83	30,58	7,83	6,08	2,50	1,00	3,33
2019	3,50	14,42	5,83	8,08	5,42	0,00	7,58	34,17	2,75	6,17	11,25	1,67	2,08	26,25	8,08	14,75	6,08	1,25	3,67
2020	3,08	10,83	3,17	9,08	3,50	2,83	5,17	20,92	2,83	2,92	8,92	1,75	2,08	27,00	4,00	4,00	8,83	1,75	3,17
2021	23,67	21,08	21,75	21,75	22,83	8,75	16,75	22,50	13,42	10,58	13,17	6,92	18,25	24,00	11,58	20,75	16,58	19,17	18,17
2022	38,92	59,58	40,42	60,83	39,75	60,67	45,08	74,50	50,75	40,42	48,83	60,08	44,75	53,00	63,17	40,08	38,50	15,58	38,67
2023	15,17	35,58	13,08	38,50	16,75	16,58	24,83	52,25	27,42	24,17	29,67	10,75	25,67	37,08	47,25	24,00	7,92	9,33	15,92

Table A8

01.05.2011 – 20.12.2023 Average Awareness of MV Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	0,00	0,38	0,00	0,00	0,00	0,00	0,13	0,13	0,13	0,25	0,00	0,25	0,38	0,50	0,25	3,00	0,63	0,00	0,00
2012	0,00	0,42	0,17	0,00	0,00	0,00	0,08	0,00	0,00	0,17	0,00	0,00	0,08	0,33	0,17	1,92	0,17	0,00	0,17
2013	0,00	0,38	0,00	0,00	0,13	0,00	0,25	0,00	0,00	0,13	0,00	0,00	0,00	0,63	0,38	1,63	0,88	0,00	0,13
2014	0,00	0,50	0,08	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,25	0,25	0,42	0,17	0,00	0,00
2015	0,00	0,33	0,00	0,00	0,00	1,50	0,17	0,08	0,08	0,08	0,00	0,00	0,00	0,00	0,33	0,17	0,50	0,50	0,00	0,00
2016	0,00	0,42	0,08	0,00	0,00	1,00	0,00	0,00	0,00	0,00	0,00	0,08	0,00	0,17	0,00	0,42	0,50	0,00	0,08
2017	0,33	0,17	0,42	0,00	0,33	0,75	0,33	0,25	0,00	0,00	0,00	0,17	0,00	0,33	0,42	0,00	0,08	0,00	0,17
2018	0,17	0,25	0,58	0,00	0,67	0,42	0,25	0,08	0,00	0,00	0,00	0,08	0,08	0,58	0,67	0,42	0,17	0,00	0,33
2019	0,25	0,50	0,50	0,00	0,33	0,92	0,58	0,00	0,00	0,00	0,08	0,17	0,08	0,75	0,33	0,42	0,33	0,00	0,25
2020	0,50	0,42	0,67	0,00	0,17	0,00	0,75	0,17	0,00	0,00	0,08	0,50	0,33	1,00	0,08	0,33	0,33	0,00	0,33
2021	23,58	18,58	19,75	14,67	22,17	26,33	17,58	20,25	8,33	10,08	12,25	11,17	44,17	22,67	7,50	20,25	17,75	12,08	20,75
2022	39,25	46,58	32,83	50,50	35,25	42,92	48,42	61,25	40,75	33,83	59,25	65,50	53,58	43,42	38,75	49,50	52,17	21,00	49,25
2023	9,42	16,17	9,92	12,08	9,75	14,67	16,75	20,58	12,17	6,83	20,83	33,50	24,08	16,67	16,33	15,17	31,33	2,58	17,25

Table A9

01.05.2011 – 20.12.2023 Average Awareness of NFT Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	0,00	0,00	0,38	0,25	0,00	0,00	0,88	0,75	1,00	0,00	0,13	1,00	0,38	0,50	2,00	0,50	0,50	0,00	1,00
2012	0,00	0,25	0,67	0,00	0,00	0,00	0,58	0,50	0,92	0,00	0,08	0,92	0,17	0,50	2,50	0,33	0,33	0,08	1,00
2013	0,00	0,50	0,38	0,00	0,00	0,00	0,25	1,38	1,38	0,00	0,00	0,38	0,38	0,25	4,00	0,25	0,13	0,00	1,50
2014	0,00	0,17	0,08	0,00	0,00	0,25	0,17	0,42	1,00	0,00	0,00	0,42	0,00	0,17	2,25	0,17	0,33	0,00	1,00
2015	0,00	0,33	0,25	0,00	0,00	1,25	0,17	0,08	1,00	0,00	0,00	0,50	0,00	0,17	2,00	0,33	0,33	0,00	1,00
2016	0,00	0,17	0,00	0,00	0,00	0,08	0,08	0,08	0,83	0,00	0,00	0,42	0,08	0,08	1,83	0,00	0,33	0,00	0,83
2017	0,00	0,00	0,00	0,00	0,00	0,50	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,00	0,00
2018	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2019	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,08	0,00	0,00
2020	0,00	0,00	0,00	0,00	0,00	0,42	0,00	0,00	0,00	0,00	0,00	0,17	0,08	0,00	0,00	0,00	0,25	0,00	0,00
2021	25,75	23,92	21,92	10,75	22,50	27,92	15,58	18,50	13,50	4,67	13,58	26,75	22,92	12,58	14,67	16,92	19,25	29,50	20,17
2022	30,75	36,00	31,00	27,42	28,83	60,08	31,50	38,08	31,50	18,42	33,83	68,17	48,42	28,25	45,83	32,58	38,92	47,67	30,75
2023	6,08	8,42	5,75	4,50	5,75	17,00	8,33	9,17	8,58	2,67	7,17	34,83	15,75	5,42	15,08	6,00	8,75	11,92	6,75

Table A10

01.05.2011 – 20.12.2023 Average Awareness of CC Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	56,50	10,88	39,38	14,88	33,38	4,75	23,13	22,25	64,00	16,75	11,13	19,88	18,88	15,88	32,88	42,13	12,50	10,13	37,13
2012	52,92	10,75	40,75	17,67	32,75	3,67	27,92	29,58	60,00	18,92	12,58	15,50	13,25	17,83	29,33	47,33	14,17	11,67	44,58
2013	83,13	17,38	83,88	32,63	53,88	6,75	45,13	55,50	94,75	24,38	22,13	19,00	18,38	30,38	39,50	74,63	25,00	19,50	85,38
2014	63,00	14,33	64,50	26,08	41,67	7,58	32,08	44,42	60,33	15,75	18,25	14,75	13,00	25,83	25,00	43,75	24,50	16,58	64,83
2015	67,83	15,75	64,25	27,58	42,25	14,58	32,83	42,75	62,50	18,67	19,92	14,33	14,08	29,67	23,42	43,92	29,92	17,83	64,25
2016	63,83	17,83	60,92	30,83	42,25	20,75	36,33	47,42	55,17	19,50	22,00	22,67	17,33	32,25	23,75	37,17	30,92	18,92	60,92
2017	68,92	34,42	58,92	50,75	48,08	52,00	52,25	62,92	52,17	18,83	29,50	66,00	43,83	48,00	21,92	43,08	33,92	13,83	60,58
2018	85,58	39,75	79,00	59,75	65,83	72,17	63,25	72,25	55,00	35,00	38,25	73,42	49,50	61,17	45,42	62,92	40,75	36,17	78,00
2019	91,00	45,67	81,25	62,42	75,67	84,67	66,58	79,25	56,25	45,08	71,50	77,08	57,42	69,33	65,67	69,42	45,92	41,58	82,50
2020	89,83	47,50	78,08	71,17	80,00	67,42	70,08	80,75	71,08	57,83	77,75	83,42	60,08	72,67	66,25	72,83	57,75	48,67	87,08
2021	80,25	38,08	59,00	57,92	58,08	39,50	66,50	65,83	63,50	32,00	55,92	74,42	49,50	56,75	54,50	61,67	45,67	27,08	62,17
2022	88,50	42,33	73,08	79,33	81,08	19,17	67,00	81,25	84,08	32,75	56,92	86,92	53,67	78,00	73,08	71,83	57,67	37,92	73,92
2023	89,42	56,42	76,67	88,58	92,67	17,42	71,08	89,00	84,17	34,67	88,08	91,58	81,50	84,67	86,50	69,58	64,92	38,83	78,83

Table A11

01.05.2011 – 20.12.2023 Average Awareness of IoT Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	8,00	13,63	5,88	16,63	33,38	15,88	5,75	5,75	4,38	1,63	51,38	2,13	2,50	3,00	2,50	1,88	1,00	0,25	10,38
2012	6,83	14,33	5,00	17,58	32,75	11,25	5,92	5,75	4,00	1,25	46,08	2,25	3,75	1,67	4,00	3,00	0,58	0,75	9,50
2013	16,75	23,75	11,63	28,75	53,88	21,13	12,63	15,38	10,88	3,63	64,25	3,25	10,00	5,50	5,13	4,38	0,88	1,50	19,75
2014	29,67	24,42	19,08	27,00	41,67	20,50	19,17	39,00	16,92	4,08	48,83	12,83	47,42	8,17	8,00	11,00	1,83	2,08	28,08
2015	53,17	42,17	39,58	43,83	42,25	55,67	39,50	64,67	41,33	11,42	64,58	50,58	72,50	20,25	16,17	15,33	5,75	5,92	51,58
2016	72,08	55,17	65,75	51,50	42,25	48,92	61,17	83,67	58,08	19,83	77,42	77,75	73,33	29,33	26,42	16,75	8,92	28,08	69,17
2017	82,58	57,42	76,83	59,92	48,08	73,83	83,83	82,42	67,75	21,83	81,50	83,67	74,83	43,08	37,25	33,00	13,33	15,42	79,75
2018	70,58	69,25	82,08	65,83	65,83	85,33	83,42	68,83	66,08	32,83	80,33	81,92	65,17	59,67	46,00	44,00	21,42	16,33	77,33
2019	68,17	75,25	83,00	65,75	75,67	80,42	76,75	67,42	64,75	51,58	79,33	69,25	55,58	60,00	50,00	36,17	24,25	14,92	84,00
2020	69,08	73,50	68,33	68,83	80,00	74,33	59,83	59,92	58,58	47,83	67,83	54,17	49,67	53,83	48,25	28,58	22,00	14,42	87,08
2021	68,67	76,33	57,42	72,58	58,08	74,08	53,25	55,25	59,00	47,00	63,75	44,67	42,17	47,25	53,42	56,58	22,58	14,83	69,58
2022	65,75	77,75	65,50	72,33	81,08	65,33	56,17	60,08	83,58	73,00	76,33	41,00	43,25	60,50	64,50	35,75	37,00	17,83	69,67
2023	61,67	78,67	62,58	80,92	92,67	52,17	55,50	56,42	80,83	78,50	78,58	37,58	55,83	61,25	73,83	30,42	33,25	15,42	66,67

Table A12

01.05.2011 – 20.12.2023 Average Awareness of AI Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	4,38	7,50	6,75	18,00	4,25	3,88	5,00	7,75	6,88	15,00	66,25	14,38	6,38	6,63	18,63	6,75	2,88	6,88	4,38
2012	4,17	7,17	6,00	19,08	4,17	3,33	4,92	8,00	6,17	13,75	71,50	13,00	5,92	6,50	14,33	5,58	2,75	6,92	4,33
2013	6,00	8,00	8,00	27,13	5,88	4,88	6,50	10,75	8,13	16,00	69,92	18,75	9,63	8,00	16,13	7,13	3,88	7,00	6,13
2014	4,33	4,92	5,42	17,75	3,92	4,08	4,75	7,75	7,25	7,92	75,33	10,00	8,42	5,50	9,67	4,08	3,00	4,17	4,33
2015	5,08	5,17	5,92	23,08	4,33	7,00	5,08	8,42	7,92	6,83	80,00	13,08	8,42	5,92	8,67	4,08	3,25	4,92	5,33
2016	5,17	4,33	6,08	19,42	4,67	9,00	5,50	8,92	6,75	5,92	71,58	18,17	11,75	4,92	8,08	3,92	3,00	4,67	5,17
2017	5,58	3,75	5,75	1,58	5,50	13,33	5,25	4,17	4,42	1,17	3,75	18,83	9,83	4,42	5,50	5,25	1,75	5,17	5,00
2018	9,58	5,17	10,42	3,17	9,17	21,58	11,75	8,75	9,83	4,08	6,67	24,92	17,17	6,42	8,83	9,50	4,58	7,83	9,25
2019	10,42	5,50	10,75	6,08	9,33	22,08	13,25	9,08	11,25	7,75	7,67	27,67	19,58	7,17	11,50	9,17	6,92	10,17	10,42
2020	9,50	5,33	9,83	7,25	8,58	19,75	12,00	8,50	10,00	5,75	6,92	25,83	23,42	7,17	12,00	8,50	7,58	9,83	10,00
2021	9,50	6,42	9,75	8,75	8,17	23,17	13,42	9,67	11,33	6,25	8,75	26,33	25,17	7,67	14,58	8,17	8,50	9,92	9,42
2022	19,17	11,83	20,08	17,08	18,75	30,25	21,67	17,17	17,25	9,33	15,50	37,33	38,58	12,92	18,25	15,75	16,00	16,92	19,00
2023	80,58	78,33	84,83	65,17	76,75	78,92	79,00	75,67	75,58	63,33	70,58	83,83	80,58	63,58	67,75	72,00	65,33	68,67	76,33

Table A13

01.05.2011 – 20.12.2023 Average Awareness of Gen AI. Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	0,13	1,50	1,63	0,25	0,25	0,13	0,25	0,88	0,38	1,13	1,00	0,00	2,00	0,75	5,25	18,00	9,75	0,75	0,13
2012	0,00	4,92	1,00	0,58	0,33	0,08	0,42	0,42	0,17	0,00	0,58	0,00	0,00	0,50	2,67	2,92	0,00	2,25	0,25
2013	0,00	5,00	1,00	0,38	0,25	0,13	0,63	0,00	0,25	1,13	1,38	0,00	0,25	1,50	1,75	3,00	2,63	3,13	0,38
2014	0,00	0,92	0,00	0,92	0,42	2,67	0,58	0,00	0,00	1,00	0,00	0,00	0,17	0,67	1,00	3,00	0,92	3,00	0,17
2015	0,00	1,58	0,33	0,17	0,00	2,08	0,25	0,08	0,00	1,08	0,00	0,00	0,42	0,00	1,08	0,50	2,25	0,00	0,00
2016	0,00	3,17	0,17	0,50	0,58	2,00	0,50	0,33	0,08	0,00	0,42	0,00	0,08	0,00	0,58	0,00	3,25	0,00	0,25
2017	0,00	2,08	0,58	0,67	0,25	0,58	0,17	0,17	0,00	1,75	0,58	0,00	0,67	2,00	0,67	3,08	1,33	2,08	0,17
2018	0,00	1,08	0,42	0,00	0,58	0,58	0,33	0,33	0,00	0,83	0,08	0,00	0,25	1,08	1,58	0,83	2,08	1,50	0,17
2019	0,00	1,00	0,42	0,25	0,25	0,83	0,08	0,33	0,00	0,33	0,08	0,00	0,17	0,83	1,25	2,75	2,08	2,08	0,17
2020	0,00	0,58	0,25	0,33	0,33	0,67	0,33	0,25	0,00	0,25	0,42	0,00	0,08	0,25	1,17	1,83	1,75	2,25	0,08
2021	0,00	1,92	0,17	0,00	0,33	0,83	0,17	0,25	0,00	0,50	0,25	0,00	0,17	2,75	0,00	0,42	1,58	1,08	0,08
2022	0,00	1,08	0,08	0,00	0,17	0,75	0,25	0,08	0,00	0,83	0,25	0,00	0,17	1,08	0,83	0,25	3,42	0,00	0,08
2023	61,33	46,17	59,67	50,75	56,00	38,75	60,67	46,83	55,75	46,17	48,08	34,67	40,17	54,75	35,92	44,17	44,33	52,58	57,67

Table A14

01.05.2011 – 20.12.2023 Average Awareness of RPA Technology Across G20 Countries by Year

Years	USA	ARG	AUS	BRA	CAN	CHI	GER	FRA	INDI	INDO	ITA	JAP	KOR	MEX	RUS	SOA	SAR	TÜR	UK
2011	24,88	52,63	85,38	84,50	11,25	0,75	11,88	34,50	6,63	15,38	42,25	0,63	3,63	36,00	5,00	12,25	6,13	10,63	32,38
2012	24,33	52,17	71,75	75,92	12,92	1,33	13,67	36,00	5,58	17,33	28,25	0,67	1,25	32,58	5,67	18,83	10,67	21,67	35,25
2013	34,50	73,63	100,38	107,50	23,13	3,38	16,63	55,13	9,13	18,25	41,13	1,25	4,63	37,25	8,50	31,25	6,00	19,38	46,13
2014	23,42	55,42	67,33	73,50	18,00	3,08	14,83	40,50	7,25	13,00	25,25	0,83	2,50	26,25	5,92	21,75	4,00	12,25	31,92
2015	28,50	55,00	67,08	70,50	14,67	23,00	14,50	42,42	7,75	24,17	31,58	0,58	20,67	29,75	6,25	31,58	6,25	10,42	38,08
2016	24,75	43,67	56,75	57,83	10,42	5,75	13,50	37,83	16,67	13,83	23,67	1,83	25,17	24,75	6,42	19,58	7,25	6,75	33,50
2017	27,25	2,92	10,92	1,25	8,92	9,17	17,00	11,58	58,25	5,08	14,67	28,83	3,25	13,58	2,33	26,25	10,58	3,50	20,92
2018	53,67	17,33	19,58	3,42	17,75	21,33	37,42	45,58	67,50	13,17	41,50	79,42	15,75	27,75	12,75	37,00	20,08	17,00	31,33
2019	76,25	37,17	31,50	24,08	29,58	51,33	54,83	75,50	79,92	48,50	62,83	79,08	40,33	49,25	29,67	64,00	69,75	43,00	61,25
2020	84,92	59,00	39,00	48,50	48,42	57,67	60,08	66,83	70,00	55,33	58,00	54,92	45,08	67,25	38,92	49,00	63,75	53,50	80,75
2021	84,17	76,67	25,08	70,50	41,25	66,83	53,83	78,08	69,75	57,00	61,58	45,75	41,50	66,08	42,67	43,00	72,42	63,25	43,50
2022	82,50	79,67	27,92	84,33	47,08	78,83	58,42	78,42	76,83	41,00	71,83	43,17	42,50	84,92	52,42	53,42	71,17	85,00	47,67
2023	73,67	79,50	29,92	91,42	51,83	70,33	50,50	71,17	58,25	37,92	67,50	41,83	76,17	77,42	72,58	44,33	67,67	79,33	57,83