BİL TÜRK Journal of Economics and Related Studies
BİL TÜRK Ekonomi ve İlişkili Çalışmalar Dergisi

Examining the Perception of the Metaverse: A Scale Development Study

Öznur Bozkurt[a]
[a] Duzce University, Turkiye, oznurbozkurt@duzce.edu.tr , https://orcid.org/ 0000-0002-8846-1850

ARTICLE INFO

Research Article

2024, Vol. 6(4), 248-268

e-ISSN 2667-5927

Article History:

Received: 06.08.2024
Revised: 12.10.2024
Accepted: 19.10.2024
Available Online: 29.10.2024

JEL Codes: L26, M19, O31

Keywords: Metaverse, metaverse perception, scale development, metaverse perception scale

Examining the Perception of the Metaverse: A Scale Development Study

Abstract

Metaverse is an innovative step that has the potential to impact investors, users, and other segments of society. In terms of the impact it creates, the metaverse can be perceived as positive by some people, while it can be perceived as negative by others. To manage the perception of Metaverse correctly, it is important to reveal what Metaverse is, what aspects provide social benefits, what factors cause negative consequences, and what features may unsettle users. This study aims to develop a measurement tool that can be used to measure both positive and negative perceptions of Metaverse. In this context, a quantitative research method was used, and data was collected using a survey technique. As a result of the analysis of the data, the eight-dimensional and 29-item "Metaverse Perception Scale" emerged. It was also observed that participants' negative perceptions of the Metaverse were higher than their positive perceptions.

Metaverse Algısının İncelenmesi: Bir Ölçek Geliştirme Çalışması

Öz

Metaverse, yatırımcıları, kullanıcıları ve toplumun diğer kesimlerini etkileme potansiyeline sahip yenilikçi bir adımdır. Oluşturduğu etki açısından metaverse kimileri tarafından olumlu olarak algılanırken kimileri tarafından olumsuz olarak algılanabilir. Metaverse algısını doğru yönetebilmek için Metaverse'nin ne olduğunu, hangi yönlerinin toplumsal fayda sağladığını, hangi faktörlerin olumsuz sonuçlar doğurduğunu ve hangi özelliklerinin kullanıcıları tedirgin edebileceğini ortaya koymak önemlidir. Bu çalışma, Metaverse'ye ilişkin hem olumlu hem de olumsuz algıları ölçmek için kullanılabilecek bir ölçüm aracı geliştirmeyi amaçlamaktadır. Bu kapsamda nicel bir araştırma yöntemi kullanılmış ve anket tekniği ile veriler toplanmıştır. Verilerin analizi sonucunda sekiz boyutlu ve 29 maddelik "Metaverse Algı Ölçeği" ortaya çıkmıştır. Ayrıca katılımcıların Metaverse hakkındaki olumsuz algılarının olumlu algılarından daha yüksek olduğu görülmüştür.

To cite this document: Bozkurt, Ö. (2024). *Examining the Perception of the Metaverse: A Scale Development Study.* BILTURK, The Journal of Economics and Related Studies, 6(4), 248-268. doi: 10.47103/bilturk. 1528751.

1. Introduction

The metaverse and the new industry structure it has revealed have not been fully clarified in the relevant literature. Of course, it takes time for innovations to mature. In this respect, the contribution of each study is quite high. In the relevant literature, some studies approach the Metaverse concept and the innovations it brings from a positive perspective; However, some studies approach the subject from a negative perspective. Many studies have also been conducted suggesting that caution should be exercised when interacting in these environments and inviting individuals to be inquisitive. Of course, studies that approach the issue critically are not carried out to prevent the progress of the system. These studies contribute to what is most appropriate for both platform providers and users. Metaverse, as a new marketing platform, has the potential to enable new initiatives to emerge. Therefore, establishing safe systems is very important for the sustainability of successful entrepreneurs and enterprises. Metaverse offers opportunities to experience unique expressions by integrating real and virtual environments. It will be supported and developed depending on developments in artificial intelligence and blockchain technologies. There are concerns about protecting users and preventing crime regarding Metaverse, which allows people to interact in the digital world.

In studies on the Metaverse, it is seen that research has been conducted on positive and negative effects. The negative effects of the metaverse are mostly addressed in psychological, physical, security, moral, and legal dimensions. It is also emphasized that it may have negative effects such as stress, addiction, data security, psychological security, data theft, misuse, and loss of moral values. While it is much easier to see these negative effects on platforms where the necessary precautions are not taken and not inspected by public authorities, it is also a fact that security risks can be minimized on platforms where the necessary security measures are taken (Dwivedi et al., 2023b). Since the Metaverse is a new concept, studies show that participants do not have clear ideas. While some view the issue as having negative consequences, some view it as having positive consequences. Uncertainty will disappear over time and user experiences will shape the view of the event (Ramachandran, 2023, p. 1009-1014). According to Usmani (2022), various biometric data can be used to log in to the system to ensure the security of entry to the system, prevent the theft of personal data, and prevent the identities created by users' avatars from being copied. With identity verification, users can be assured that they are who they claim to be. This provides confidence in the system and the accuracy of the information shared in the system.

Metaverse has the potential to cause visual impairments and addictions. Spending long hours on screens can create addiction and cause eye disorders. It also involves the problem of monitoring and using personal data. Especially those who work in the field of marketing can create product advertisements that attract people's attention by monitoring their emotions and reactions (Usmani, 2022). The individual, who can take on many different personalities with the avatars created, may engage in antisocial behavior in real life. An individual who communicates on the screen may have problems in bilateral relations in real life; because he can express himself with a different character in the virtual environment. Users who impress others with characteristics they do not have may take on an introverted personality in real life (Jamison and Glavish, 2022).

The effects of the metaverse can be discussed under three headings: economic, social, and environmental. It will make positive contributions to economic recovery. It will facilitate money transfer, especially in trade. Social development will increase with this system, which increases interaction between societies and facilitates e-learning. By ensuring that cultural heritage is stored and transferred to subsequent generations, losses that may occur in this heritage can be prevented. It can also contribute to environmental sustainability through approaches such as design and marketing that ensure efficient use of resources and require less need for physical objects (Ferric, 2023). By providing the opportunity to participate in intercontinental events, Metaverse can prevent distance problems, especially for disabled individuals or others who do not have the opportunity to participate in these events. It will become easier to acquire new knowledge and experience without being limited to the physical world (Burchardt, 1999, p. 227-247). Metaverse, which will facilitate accessibility for tourism businesses operating in the service sector, will increase participation in accessible and sustainable tourism activities by enabling disabled individuals to experience destinations. In addition, Metaverse, as a much more effective tool in product promotion and marketing than the traditional approach, has the potential to provide suitable environments (Ferric, 2023). The metaverse has the potential for both positive and negative effects. Therefore, it is very important to examine its effects on users and their perceptions of the metaverse.

2. Literature Review

2.1. Concept of Metaverse and Perception Towards Metaverse

Metaverse has become a topic of interest in the last few years in the digital age, where technological changes continue unabated. Metaverse describes a universe in which individuals have experiences with their virtual characters. Metaverse refers to an artificial environment that is interpreted as beyond the universe and is connected to the physical world (Lee at al., 2021). Metaverse is a virtual world designed as a copy of the real world, where people interact politically,

economically, psychologically, and culturally with their digital twins called avatars (Duan et al., 2021). Virtual reality and augmented reality applications contribute to the development process of the Metaverse by enabling the visualization of a virtual world. With virtual reality glasses (VR), people interact in a simulated environment and experience the events taking place in this environment in real-time. Augmented reality (AR) provides a better understanding of real environments. In this respect, it differs from virtual reality. Augmented reality, which enhances real-world objects, allows individuals to perceive and interact with real-world objects as if they were real (Xiong et al, 2021, p. 216).

Metaverse increases people's interaction with each other. This enables interactive meetings with customers or business partners. At the same time, customers can obtain detailed information about the product and experience it. It supports interaction in remote working applications during epidemic periods such as Covid 19. Learning can be turned into fun thanks to materials visualized in the virtual environment. For example, medical people can perform surgical interventions on virtual people to improve their experience. In dangerous lines of work, learning can be facilitated by experiencing the work in safe environments. Consumers can be offered different purchasing experiences and try products before purchasing. With the use of cryptocurrencies in trade, the exchange of goods can become easier and this transaction can be carried out safely thanks to blockchain (Bale et al, 2022, p. 1-11). While businesses provide their customers with the opportunity to introduce and experience new products, they also gain new customers thanks to their shares. In addition, experiences and shopping in the virtual world can direct consumers to buy those products and brands in the real world. The contents in Metaverse and the ease of payment systems are effective in attracting consumers to these areas (Kim, 2022). The socialization benefit of consumers interacting with both businesses and other users also affects customer loyalty (Srihadiand and Setiawan, 2015). Observing the behavior of consumers in the virtual environment can provide a convenient data flow to create products that they may be interested in and to direct consumers to the right products (Liu, 2020, p. 669–686).

Restrictions imposed during periods such as the epidemic have directed people to do business online. This situation creates a new economy by increasing the need for internet initiatives. In the new digital economy, many activities such as online education, entertainment, and sports have been offered to large audiences (Yuan and Yang, 2022, p. 15). In the healthcare sector, the use of VR and AR technologies in the fields of education, treatment, and rehabilitation is used to support the services offered. Medical training can be received in realistic environments and provides the basis for correct practices in surgical interventions. The use of metaverse in the treatment of mental problems increases treatment motivation

and therapeutic effect. Physical and mental rehabilitation studies can be carried out in virtual environments similar to the real environment. Metaverse, which facilitates rapid information sharing among health professionals, also provides suitable environments for storing data. It ensures the continuation of health services, especially during epidemic periods, with remote access opportunities for patients (Lee, 2022, p. 14). In addition to facilitating access to treatment for those suffering from psychological problems, Metaverse provides an environment that can provide effective results by diversifying the methods to be used in treatment. It has the potential to be used in many areas such as fear treatments, trauma treatments, combating stress, and combating antisocial behavior (Din and Almogren, 2023, p. 1-23).

With Metaverse, new employment structures, new jobs, and business models will emerge. It is predicted that the virtual economy will surpass the real-world economy. This will not happen all at once, but gradually with the business world dynamics adopted. Access to technology comes at a cost. Although Metaverse is perceived as inaccessible to everyone due to its high costs, access will become easier as costs decrease over time. When smartphones first came out, they were accessible to a limited number of users, and now they have become technologies that everyone can easily access. The meta-universe will also have more users with such a development process. The virtual universe can be a suitable investment areas not only for technology companies but also for traditional manufacturing businesses. According to the report "The role of digital work platforms in the transformation of the working world 15" published by the International Labor Organization in 2021, the number of digital work platforms has increased fivefold in the last decade and the labor demand is increasing every year in parallel with this (Filipova, 2023, p.7-32).

Metaverse increases social and cultural sharing by making it easier for individuals to interact. These environments, which increase the effectiveness of information transfer, can be supportive for people in geographically isolated regions. Apart from this, Metaverse is also an effective tool in supporting the learning processes of individuals with different needs and abilities (Din and Almogren, 2023, p.1-23).Considering the facilitating effect of interesting and interactive environments on learning, it seems that they have positive effects in terms of education. Learning and experience environments ensure the permanence of the acquired knowledge.

Metaverse makes it easy for people to interact virtually; However, this may cause the individual to become antisocial and develop a second personality. An individual who interacts in a virtual environment may not be able to communicate as successfully as in face-to-face relationships. This also shows that mental health problems will increase for future generations. People may perceive this modified virtual world as their real living space, which may increase addiction to the virtual world. Staying in front of screens and sedentary environments for long hours can

negatively affect human health. Since it restricts physical mobility, it can cause obesity and muscle loss. If adequate precautions are not taken in online environments, cybersecurity problems may arise and cyberbullying may increase. Users' data can be captured and used for purposes other than their intended purpose (Bale et al, 2022, p. 1-11). Cyberbullying, addiction to staying in the virtual world, and health problems due to reduced mobility may occur (Denisov, 2019, p. 5-10). Due to long periods spent in the Metaverse, users may experience a blurred consciousness between the real world and the virtual world. Individuals who exist the way they want to be in the virtual environment may want to spend more time in the virtual world because they cannot find what they desire in the real environment. It may also have a lowering effect on real-life self-confidence (Dwivedi et al., 2023b). Individuals who tend to see themselves as in the virtual environment may want to undergo physical and psychological changes. The race to resemble a virtual twin may cause personality disorders in the individual. In addition, another threat to health is that physical harm can be caused to a person who connects to the virtual environment with tactile clothing. Hygiene problems may occur due to shared devices. Visual impairment and problems perceiving the real world may occur due to looking at the screen for a long time.

In the Metaverse, identity theft, gambling, and unethical problems are very likely to occur. It is also possible that it creates an ecosystem that paves the way for moral and legal problems. Metabullying and invasion of privacy may occur. It is very difficult to guarantee that emotional security will also be provided in environments where cyber security is provided. For this reason, it may cause people to experience psychological problems. It is likely to be a system open to cultural destruction and unethical behavior (Dwivedi et al., 2023b). Security issues may trigger psychological problems in users. Cyberbullying can have traumatic consequences. It is also possible that negative consequences such as the marketing of personal data to technology companies and surveillance capitalism may arise. Policymakers may be inadequate on unethical and illegal issues such as fraud, cyber hacking, and location access. With the constant use of XR technological devices, everything people look at and every movement they make can be recorded, and thus predictions can be made about people's future actions. People may face an invasion of privacy and information that leads to conspicuous consumption. As AR glasses become indistinguishable from other glasses, it may become difficult for people to realize that they are being watched and to take legal measures against them. On the contrary to augmented reality, reduced reality technologies can direct and change individuals' perceptions, moving them away from reality. Hackers can install reduced reality applications on users without their knowledge. This situation may have a disruptive effect on social sensitivity (Henz, 2022)

Social and cultural ties may face the threat of weakening. People's tendency to develop bilateral relations in the virtual world may have an impact that will disrupt the social structure of humanity (Weyl et al., 2022). Since all movements of people are recorded in the metaverse, which poses the danger of creating an artificial social structure, a privacy problem may arise. Additionally, when people design avatars, they may present them as having features that they do not have (Vatoropin et al., 2022, p. 19-25). Not being able to find the features of the created avatars in reality may cause psychological problems. Users can experience conflicts in their inner world. It may also cause losses in social relationships with the people around them.

With the globalization of communication, information theft may occur and this requires new regulations to take security measures. Regulatory regulations are necessary to prevent loss of trust in Metaverse platforms and metadata. In particular, problems such as digital inequalities and loss of privacy are likely to arise. The risk of collecting personal data and information about reactions to events in the virtual environment and using them for purposes other than their intended purpose is a serious problem (Filipova, 2023, p. 7-32). It is possible to direct consumers to hedonistic consumption and to create content that will influence them for this purpose. In marketing-oriented enterprises, open systems emerge in which consumers will be manipulated (Liu, 2020, p. 669–686).

Since working environments will change, relations between employees and employers will need to be reconstructed. It is important for people to design their avatars appropriately in the virtual environment. Failure to do so may also negatively impact institutional trust. Determining what to do to encourage employees in a virtual environment can reveal complex processes. Issues such as determining working hours and what the employer's liability will be due to the crime committed by the employee are still controversial (Cheong, 2022). Large businesses that invest in Metaverse can create a monopolistic structure in competition. The economic structure may become centralized as a result of limiting access or causing high costs. Metaverse platforms may create service contracts to increase their profits (Dwivedi et al., 2023a, p. 750-776).

3. Methodology

Phenomenological approach was used in the research. The phenomenological approach was used in the research and it was conducted according to the quantitative research method. This research was conducted based on quantitative data. Primary data was collected by survey technique. It aims to develop a measurement tool to evaluate perceptions of the Metaverse. When the relevant literature is examined, it is seen that the majority of studies on Metaverse in social and human fields are conducted within a conceptual framework. Apart from this, it is seen that research is being done on the use of platforms and the tools in these platforms in other branches of science. Obtaining the opinions of Metaverse users

is important for the development of the system. A very small percentage of the world's population currently has access to Metaverse platforms. It is seen that those with technical infrastructure cannot reach their targeted audiences due to user perceptions. This study aims to measure Metaverse users' or potential users' positive and negative perceptions of Metaverse. For this purpose, since there is no measurement tool in the relevant literature, it is aimed to develop a "perception scale for the Metaverse" that can be used in future studies.

4. Research Process

In the research, a literature review was conducted to create the relevant scale, and studies on Metaverse were examined. In this review, both the scope of the Metaverse concept and the effects of the Metaverse are analyzed. After evaluating all these studies, it was aimed to create a measurement tool that would best suit the scope of the research. A question pool was created by the researcher to measure positive and negative perceptions towards Metaverse. Then, this question pool was examined by 4 academicians who are experts on the subject, and a questionnaire consisting of 54 items was created. During the pre-test phase, responses to this draft scale were received from 73 people. As a result of the feedback received, 12 questions that were not understood and had low reliability were removed from the scale. The measurement tool, consisting of 42 questions, was finalized and applied to the sample. The research was not conducted on a specific universe and everyone who knew the Metaverse was included in the sample. Convenience sampling was used as the sampling method and surveys were collected online. The first question in the measurement tool aims to determine whether there is an awareness of the Metaverse concept. Those who do not know this concept and its content have not moved on to answer other questions. 393 people participated in the research voluntarily.

In the analysis of the data collected from the sample, reliability tests were first performed. At this stage, analyses were conducted on 393 surveys as explained above. 6 of the 42 statements were removed from the analysis because they compromised reliability. In the second stage, exploratory factor analysis was conducted via SPSS 26. At this stage, 7 more statements with factor loadings below 30% were removed from the scale. The Metaverse perception scale, consisting of a total of 29 statements, emerged in an 8-dimensional structure. After the exploratory factor analysis, confirmatory factor analysis was also conducted using the AMOS program. The fit values were within acceptable limits and the model was confirmed. As a result, the 29-variable and 8-dimensional "Metaverse Perception Scale" emerged. This scale is a 5-point Likert-type scale ranging from disagree to

agree. The reliability coefficient of the scale at this stage is .930. Below are the findings of all analyses.

5. Findings

5.1. Reliability and normal distribution analysis

Before moving on to analyze to determine the factor structure in the study, analysis was conducted to determine the reliability of the variables. Table I shows the confidence coefficient of each variable. Additionally, analyses to determine whether the data set has a normal distribution are included in the table.

Before proceeding with the factor analysis of the research data, analysis was carried out to test the reliability of the data set. According to (Hair et al., 2014), for the scale to be reliable, the alpha value must be .70 and above. When the reliability values of the variables that make up the scale were examined, it was seen that a total of 6 statements that compromised reliability should be removed from the analysis and these statements were removed from the analysis. At this stage, 36 variables in the 42-variable measurement tool have a confidence value of 0.70 or above.

Table 1. Reliability and Normality Analysis

Variable	Mean	St. Dev.	Alpha	Kurtosis	Sweknes
1	3,80	1,191	,928	-,166	-,837
2	3,98	1,148	,928	,219	-1,042
3	3,81	1,170	,928	-,421	-,709
4	3,98	1,088	,927	-,122	-,856
5	3,80	1,195	,927	-,376	-,747
6	3,83	1,191	,929	-,445	-,736
7	3,80	1,228	,929	-,304	-,799
8	3,88	1,172	,928	-,278	-,812
9	3,63	1,182	,928	-,674	-,480
10	3,54	1,247	,928	-,811	-,418
11	3,62	1,238	,928	-,625	-,543
12	3,59	1,199	,928	-,693	-,476
13	3,83	1,150	,927	-,154	-,791
14	3,80	1,084	,927	,751	-,992
15	4,00	1,008	,929	-,295	-,599
16	3,70	1,118	,929	,815	-1,124
17	4,07	1,054	,928	-,686	-,454
18	3,63	1,169	,928	-,524	-,564
19	3,72	1,137	,928	-,389	-,554
20	3,79	1,067	,928	,154	-,851
21	3,92	1,069	,928	-,905	,080
22	2,98	1,256	,927	-1,092	,137
23	2,87	1,354	,927	-,572	-,293
24	3,44	1,135	,929	-,762	,025
25	3,22	1,149	,929	-,032	-,826
26	3,96	1,078	,928	,082	-,880
27	4,00	1,073	,928	,025	-,862
28	4,01	1,076	,928	-,085	-,867
29	3,98	1,102	,928	-,166	-,837

5.2. Exploratory Factor Analysis

Table 2, contains the exploratory factor analysis results for the variables. Factor structure, eigenvalues, and explained variance values are also included in the table. Table 2 shows the exploratory factor analysis of 2 scale expressions. To perform factor analysis on the variables, KMO and Bartlett's tests were first performed to determine the suitability of the data set for analysis. As a result of this analysis, it was seen that the data set was suitable for factor analysis (KMO>.500; sig ≤.050). As a result of the factor analysis, 7 variables with factor loadings below .30 were removed from the data set. As a result of factor analysis, an 8-dimensional structure consisting of a total of 29 expressions with an eigenvalue of 1 and above emerged.

Table 2. Exploratory Factor Analysis

Dimensions	1	2	3	4	5	6	7	8	Eigenvalue	Variance
CA									7,027	18,906
1	,788									
2	,771									
3	,650									
4	,616									
5	,544									
SE									4,501	14,036
6		,831								
7		,773								
8		,739								
9		,688								
EH									4,240	12,115
10			,857							
11			,813							
12			,550							
SC									1,688	4,823
13				,741						
14				,733						
15				,645						
16				,608						
17				,533						
EI									1,388	3,966
18					-,789					
19					-,713					
20					-,677					
PD									1,179	3,370
21						,813				
22						,797				
23						,724				
24						,708				
ER									1,089	3,112
25							,728			
26							,705			
NP									1,016	2,902
27								,899		
28								,780		
29								,520		

KMO: ,928; Bartlett' s Test, 7308,788; df:595; Sig: ,000 Total Variance Explained: 63,224
CA-Perception of Contribution to the Development of **C**ommercial **A**ctivities
SE-Perception of **S**afe **E**nvironment (Platform)
EH-Perception of Facilitating **E**ffect of **H**ealth Services
SC-Perception of **S**ocial-**C**ultural Impact
EI-Perception of **E**conomic **I**nequality
PD-Perception of Concern Regarding the Reliability of Shared **P**ersonal **D**ata
ER-Perception of **E**quipment **R**isk
NP-Perception of **N**egative **P**sychological Impact

5.3. Confirmatory factor analysis

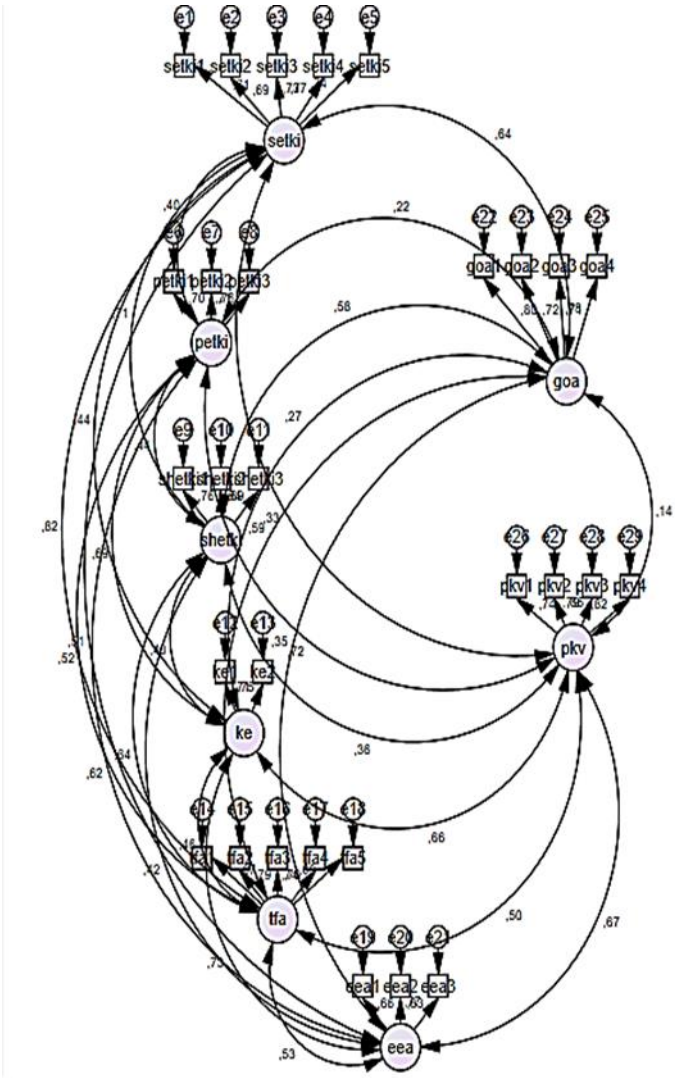
Confirmatory factor analysis was conducted to verify the structure that emerged as a result of the exploratory analysis. Below are the confirmatory factor analysis findings using the AMOS program. First-level multi-factor confirmatory factor analysis (CFA) was applied to verify the structure obtained as a result of the exploratory factor analysis conducted for the validity of the research model and to make measurements with the structure. The fit values of the analysis results are in Table 3; The model diagram and factor loadings are given in Figure 1.

Table 3. First Level Multi-Factor Confirmatory Factor Analysis Findings Reliability And Normality Analysis

Compatibility Values	Acceptable Fit Values1[1]	Research Model
χ^2/df	$2 \leq \chi^2/df \leq 5$	2,084
GFI	.80 ≤ GFI ≤ 95	,889
CFI	.80 ≤ CFI ≤ .95	,934
TLI	.80 ≤ TLI ≤ .95	,923
NFI	.80 ≤ NFI ≤ .95	,881
RMSEA	.05 ≤ RMSEA ≤ .10	,053
[1][25]		

Table 3 shows that all fit values are within the acceptable range (Tabachnick and Fidell, 2013; Marsh, 2012; Kline, 2011; Hooper et al.,2008). Therefore, the validity of the structure obtained by exploratory factor analysis was also confirmed by confirmatory factor analysis. The diagram of the model obtained by confirmatory factor analysis is given in Figure 1.

Figure1. First-level multifactor CFA model diagram



5.4. Descriptive Data on Metaverse Perception Dimensions

The means, standard deviations, reliability values, kurtosis, and skewness values of each dimension of the eight-dimensional metaverse perception scale, which emerged as a result of factor analysis, are given in Table 4. According to the findings in Table 4, the reliability values of the Metaverse perception scale are over 70%. The variable that the participants evaluated with the highest average tendency was the concern they had about the reliability of personal data. It is noteworthy that people or organizations interacted with on the platforms do not correctly identify themselves and there are concerns that legal controls will be insufficient in this regard. Another issue that stands out in a negative dimension is that it will have negative effects on the psychological health of users. Apart from this, there is a perception that it will have a positive impact on the economy by improving commercial activities. Participants also have the perception that interpersonal interaction will positively affect cultural and social development. The first four dimensions measure positive perception and the next four dimensions measure negative perception. When evaluated in general, the negative perception averages of the research participants are higher than the positive perception averages.

Table 4. Statistics of Metaverse Perception Dimensions

Variables	Mean	Std. Dev.	Skewness	Kurtosis	α
Perception of Contribution to the Development of Commercial Activities	3,90	,842	-,736	,542	,822
Perception of Safe Environment (Platform)	3,13	1,007	,159	-,495	,849
Perception of Facilitating Effect of Health Services	3,59	1,032	-,408	,546	,830
Perception of Social-Cultural Impact	3,87	,913	-,711	,064	,825
Perception of Economic Inequality	3,71	,942	-,462	-,206	,827
Perception of Concern Regarding the Reliability of Shared Personal Data	3,99	,925	-,869	,445	,833
Perception of Equipment Risk	3,71	1,029	-,605	-,259	,836
Perception of Negative Psychological Impact	3,84	,991	-,766	-,031	,834

6. Discussion and Conclusions

Since the first industrial revolutions, many innovations have emerged for humanity. It is also seen that innovations do not remain in their original form and change and develop over time. For example, the steam engine, which was the energy source, was replaced by electrical energy over time. Nowadays, it is seen that artificial intelligence is included in economic and social life with the influence of developments in the IT sector. Virtual worlds have emerged as a new sharing platform with the tools supported by the development of communication technologies. These innovations have sometimes been considered and accepted as quite useful; However, it sometimes encountered resistance. Metaverse is one of these innovative steps. Although it has not been made available to everyone equally around the world, it has become a subject that almost everyone follows with curiosity and talks about.

It is seen that the studies on Meteverse have increased in the last few years and the subject has been addressed by researchers from almost every branch of science; Because the effects of the Metaverse appear in a very wide area. Metaverse, which has the potential to be used in a wide range of areas, from commercial activities to social life, from health to tourism, can be evaluated differently by users in these areas. While some are against the Metaverse and the virtual world that emerged with its influence and think about its negative aspects, some have a positive view of the Metaverse. Metaverse requires, first of all, a good technological infrastructure. In addition, it is very important to use this technology for the benefit of humanity and to prevent its possible negative effects. The idea behind the negative view of the Metaverse is the perception of risk for these negative effects to occur.

When academic studies on the Metaverse are examined, it is seen that the people studied have different ideas on the subject. It is stated that conspicuous consumption will increase, and people will present themselves with different identities in the virtual environment and will even tend to make changes in their real lives to become the person with this identity. It is thought that economic inequalities will increase, negative effects on physical and psychological health will occur, security and privacy will be violated, interaction between people will harm cultural values, and unlawful acts will occur due to legal gaps. However, there are many positive opinions about Mateverse. The prevailing views are that new entrepreneurial opportunities will emerge, that it will have very beneficial results for educational purposes,

especially in the health sector, that access to information will be easier, that it will make positive contributions to commercial activities, and that it will increase social development. According to Srihadiand and Setiawan (2015), Metaverse increases the sharing of information among consumers. This provides positive contributions to commercial activities. Customer loyalty increases with the rapid resolution of customer requests. According to Liu (2020) in the metaverse, it is easier to observe consumers' purchasing behavior and offer them personalized products. This ensures the production of the right products. These two approaches, positive and negative, are discussed in detail in the literature section of the article.

In a study conducted with Metaverse, 47% of the participants stated that they thought it would increase the interaction between people, while 37% stated that it would harm or decrease the interaction between people. 16% of the participants reported that they did not have a clear idea of this issue (Ramachandran, 2023, p.1009-1014). This study shows that people still have concerns about the Metaverse. On the other hand, another study found the following findings: In some societies, skin color, origin, gender, and even physical appearance can lead decision-makers to act biasedly. Metaverse can be used effectively in environments where discrimination and biased behavior will occur. It can improve the efficiency of the judicial process by using it in the operations of legal systems. For this reason, it can also be used in courts. Thanks to the avatars of disabled individuals, it can make it easier to benefit from the service by ensuring that they are equally included in the common platform with non-disabled individuals (Bozkurt and Gümüş, 2023).

It is thought that the results obtained in the studies on the Metaverse are due to concerns about the subject. For this reason, it is necessary to determine the reasons for the particularly negative perception regarding Metaverse. Unless developments are made to eliminate people's negative thoughts, Metaverse will be insufficient to provide the benefits expected from it. In this study, it was aimed to develop a measurement tool to be used to measure the perception about Metaverse. It is thought that this measurement tool will provide useful data for Metaverse's current users, potential future users, investors, and policymakers. All research methodologies were followed meticulously in the development of the measurement tool. Validity and reliability tests of the measurement tool

were conducted. The measurement tool has a structure that measures both positive and negative perceptions. However, additional analyzes showed that it was appropriate to use the dimension measuring positive perception alone with its four sub-dimensions. This positive perception dimension can be expressed as a "Metaverse perception scale short form". The scale, consisting of 29 variables and 8 dimensions, is given in the appendix of the article.

When the findings obtained from the measurement tool were evaluated in general, it was seen that the participants' negative perceptions about Metaverse were higher than their positive perceptions. In the negative perception dimension, it is seen that statements such as data security will not be ensured and deceptive information will be shared come to the fore. Apart from this, there is a strong belief that it will have detrimental effects on psychological health. In the positive perception dimension, the idea that it will increase the effectiveness of commercial activities comes to the fore. It has been observed that the belief that data will be shared on a platform where necessary security measures are taken is low. In short, there is a safe environment concern among the participants, and this is very effective in directing the perception towards the Metaverse. Based on this result, it is clear that it is necessary to ensure that legal regulations are made for the supervision and control of Metaverse environments, that the accuracy of the data shared by users must be ensured, and that preventive measures must be taken against illegal and unethical content. According to Filipova (2023) although investment in digital technologies is increasing, it is still not sufficient. Such situations affects accurate and fast data sharing. With the metaverse, antisocial behaviors may increase and interaction between people becomes artificial (Din and Almogren, 2023). According to Jamison and Glavish (2022), the metaverse has the potential to cause behavioral problems by causing people to perceive characteristics that they do not have. Cyberbullying, addiction to staying in the virtual world, and health problems due to reduced mobility may occur (Denisov, 2019, p. 5-10). In this context, the biggest responsibility falls on lawmakers and Metaverse platform owners. It is important to make promotions to inform users behind these regulations. Another issue is about tools that will facilitate trading in the Metaverse environment. It is necessary to facilitate access to these tools, to eliminate the harm that these tools may cause to human health, and to prevent the collection of information that the user does not consent to through these tools

This study aims to contribute to the development of the relevant literature by contributing to studies in the field of Metaverse. The most fundamental of this contribution is the development of a measurement tool that can be used by those who will research the metaverse. In future studies using this perception scale, it may be suggested that the following subjects be addressed together with perception in Metaverse perception studies: personality traits, technology acceptance, technological stress, culture, innovation tendency, individual values, and risk perception. In addition, considering that there is a much greater need for studies based on quantitative data on Metaverse, it is recommended that the studies to be carried out should be carried out away from conceptual scanning.

References

Bale, A. S., Ghorpade, N., Hashim, M. F., Vaishnav J., and Almaspoor, Z. (2022). A Comprehensive study on Metaverse and its impacts on humans. *Advances in Human-Computer Interaction*, 2022, 1-11 https://doi.org/10.1155/2022/3247060, 2022

Bozkurt, Ö and Gümüş, İ. H. (2022). Metaverse and MetaEntrepreneurship: A conceptual framework. *Journal of Entrepreneurship and Development,* 17(1), 75-85

Burchardt, T., Le Grand, L. and Piachaud,D. (1999). Social exclusion in Britain 1991–1995. *Social Policy and Administration,* 33(3), 227–244. https:// doi. org/ 10. 1111/ 1467- 9515. 0014

Cheong, B. C. (2022). Avatars in the Metaverse: Potential legal issues and remedies. *International Cybersecurity Law Review*, 3(2), https://doi.org/10.1365/s43439–022–00056–9

Denisov, E. I. (2019). Robots, artificial intelligence, augmented and virtual reality: ethical, legal and hygienic issues. *Hygiene and Sanitation,* 98(1), 5–10. (In Russ.). https://doi.org/10.18821/0016–9900–2019–98–1–5–10, 2019

Din, I. U. and Almogren, A. (2023). Exploring the psychological effects of metaverse on mental health and well-being. *Information Technology & Tourism,* 25(3), 1–23, http://dx.doi.org/10.1007/s40558-023-00259-8

Duan, H., Li, J., Fan, S., Lin, Z., Wu, X. and Cai,W. (2021). Metaverse for social good: a university campus prototype. *Proceedings of the 29th ACM International Conference on Multimedia*

Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J., Balakrishnan, J., and Wirtz, J. (2022). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology & Marketing,* 40(4), 750–776. https://doi. org/ 10. 1016/j. jbusr es. 2022. 113420

Dwivedi, Y.K., Kshetri, N. and Hughes, L.et al.,(2023b). Exploring the darkverse: A multi-perspective analysis of the negative societal impacts of the Metaverse. *Information Systems Frontiers,* 25, 2071-2114, https://doi.org/10.1007/s10796-023-10400-x.

Ferric, L. F. (2023). New digital culture metaverse preparation digital society for virtual ecosystem, *E3S Web of Conf*., https://doi.org/10.1051/e3sconf/202338804057

Filipova, I. A. (2023). Creating the metaverse: consequences for economy, society, and law. *Journal of Digital Technologies and Law*, 1(1), 7–32, https://doi.org/10.21202/jdtl.2023.1

Hair, J. F., Black, W. C., Babin B. J., and Anderson, R. E. (2014). *Multivariate data analysis*. (7). Harlow: Pearson New International Edition

Henz, P. (2022). The societal impact of the metaverse. *Discov Artif Intell*, 2(19), https://doi.org/10.1007/s44163-022-00032-6

Hooper, D., Coughlan, J., and Mullen,M. (2008). Structural equation modeling: Guidelines for determining model fit. *Electronic Journal of Business Research,* 6, 1, 53–60

Jamison, M. and Glavish, M. (2022). The dark side of the Metaverse, Part I. *AEIdeas,* March 17, https://www.aei.org/technology-and-innovation/the-dark-side-of-the-metaverse-part-i/, 2022

Kim, J.H. (2022). Retailers seeking new growth Engines with NFT, Metaverse. *The Korea Times*, 2022.

Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York, NY: The Guilford Press

Lee, C. W. (2022). Application of Metaverse service to the healthcare industry: A strategic perspective. *Int. J. Environ. Res. Public Health,* 19(3038),1-14, https://doi.org/10.3390/ijerph192013038, 2022.

Lee, L.H., Braud, T., Zhou,P., et al. (2021). All one needs to know about metaverse: a complete survey on technological singularity, virtual ecosystem, and research agenda. *Journal of Latex Class Files*,14, 2021

Liu, L., Dzyabura, D., and Mizik, N. (2020). Visual listening in Extracting brand image portrayed on social media. *Marketing Science,* 39(4), 669–686

Marsh, H. W. (2012). Application of confirmatory factor analysis and structural equation modeling in sport and exercise psychology. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology,* 737–799, New Jersey, NJ: John Wiley & Sons

Ramachandran, K. K., Lakshmi, J. K., Singh, K. Prusty, A. Panduro-Ramirez J.and Lourens, M. (2023). The impact of the Metaverse on organizational culture and communication," *3rd International Conference on Advance Computing and Innovative Technologies in Engineering* (ICACITE), Greater Noida, India, 1009-1014, https://doi.org/10.1109/ICACITE57410.2023.10182655

Simon, D., Kriston, L., Loh, A., Spies, C., Scheibler, F., Wills, C., and Harter, M. (2010). Confirmatory factor analysis and recommendations for improvement of the Autonomy-Preference-Index (API). *Health Expectations,*13, 234–243

Srihadiand, T.F., and Setiawan, D. (2015). The influence of different levels of service characteristics and personal involvement towards consumer relational response behaviors. *Procedia-Social and Behavioral Sciences,*210, 378-387, doi: 10.1016/j.sbspro.2015.11.385.

Tabachnick, B. G., and Fidell L. S. (2013). *Using multivariate statistics.* (6th ed.). Pearson, Boston.

Usmani, S. S., Sharath, M., and Mehendale, M. (2022). Future of mental health in the metaverse. *General Psychiatry*, 35(4), e100825

Vatoropin A. S., Vatoropin, S. A., Teplyakov, I. I., and Chevtaeva, N. G. (2022). Metaverse: creation perspectives and social consequences. *Theory and Practice of Social Development,* 4, 9–25. (In Russ.). https://doi.org/10.24158/tipor.2022.4.2

Weyl, E. G., Ohlhaver, P., and Buterin V. (2022). Decentralized society: Finding web3's soul. *ResearchHub*, 1–36. https://doi.org/10.2139/ssrn.4105763, 2022

Xiong, E.L., Hsiang, Z., Zhan, T., and Wu, S.T. (2021). Augmented reality and virtual reality displays: Emerging technologies and future perspectives. Lig*ht: Science & Applications,* 10(1), 216

Yuan,Y., and Yang,Y. (2022). Embracing the Metaverse: Mechanism and logic of a new digital economy. *Metaverse,* 3(2), 15, doi: 10.54517/met.v3i2.1814

Appendix: Metaverse Perception Scale

Perception of Contribution to the Development of Commercial Activities					
I think it will have an employment-increasing effect	1	2	3	4	5
I think it will facilitate payment transactions as it will popularize the use of cryptocurrencies in commercial activities.	1	2	3	4	5
I think it will create new business lines	1	2	3	4	5
I think the customer and the seller will be able to interact faster	1	2	3	4	5
I think it will provide very convenient virtual work environments for those who have difficulty accessing physical spaces.	1	2	3	4	5
Perception of Safe Environment (Platform)					
I believe that the data shared by users on Metaverse will not be used out of purpose by other users and the Metaverse platform owner.	1	2	3	4	5
I think Metaverse platforms are safe environments	1	2	3	4	5
I think it will provide a safer interaction thanks to security protocols	1	2	3	4	5
I think it will provide the opportunity to experience dangerous work in advance and take precautions against risks.	1	2	3	4	5
Perception of Facilitating Effect of Health Services					
I think it will facilitate access to health services	1	2	3	4	5
I think it will make it easier to store and use health-related data	1	2	3	4	5
I think it is a useful technology in case of epidemics or other disasters.	1	2	3	4	5
Perception of Social-Cultural Impact					
I think it will be easier for people to come together in virtual channels.	1	2	3	4	5
It will provide a suitable environment for artistic activities.	1	2	3	4	5
I think it will increase cultural interaction between countries	1	2	3	4	5
I think it will make access to information easier	1	2	3	4	5
I think it will support educational activities	1	2	3	4	5
Perception of Economic Inequality					
I think everyone can't access it due to usage costs.					
I think it will create inequalities due to digital monopolization	1	2	3	4	5
I think there will be an unemployment problem due to investments shifting to the virtual world.	1	2	3	4	5
Perception of Concern Regarding the Reliability of Shared Personal Data					
I have concerns about the reliability of the data contained in the Metaverse	1	2	3	4	5
I think it will threaten personal data security (account hijacking, illegal use, etc.)	1	2	3	4	5
I think the avatars created may be misleading	1	2	3	4	5
I am concerned that legal controls will be insufficient	1	2	3	4	5
Perception of the Risk of the Equipment Used					
I think virtual reality glasses may cause injury (crash, fall, etc.)	1	2	3	4	5
It may cause hygiene problems due to shared equipment	1	2	3	4	5
Perception of Negative Psychological Impact					
I think it will create asocial individuals who tend to disconnect from social life.	1	2	3	4	5
I think it will cause a loss of perception of time	1	2	3	4	5
I think it can facilitate access to illegal activities (gambling, etc.) that are difficult to access in real life.	1	2	3	4	5