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INSTITUTE OF SOCIAL SCIENCES

BUSINESS MANAGEMENT

EVALUATING THE EFFECT OF WEB BASED AUGMENTED REALITY ON PURCHASE INTENTION IN THE ONLINE FURNITURE RETAILING BASED ON S-O-R MODEL

MASTER'S THESIS

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I hereby declare that this thesis is an original work. I also declare that, I have acted in accordance with academic rules and ethical conduct at all stages of the work including preparation, data collection and analysis. I have cited and referenced all the information that is not original to this work.

Ferhat SAYIN

to my grandfather Kemal ÜLKER

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ÖZET

Online Mobilya Perakendeciliğinde Web tabanlı Artırılmış Gerçekliğin Satın Alma Niyeti üzerindeki Etkisinin S-O-R Modeli temelinde Değerlendirilmesi

Çevrimiçi perakendecilik müşteriler tarafından her geçen yıl daha fazla talep görmektedir. Perakendeciler özellikle çevrimiçi müşteri deneyimini arttırmak ve müşterilerin ürün ya da hizmet seçiminde doğru karar verebilmesini sağlamak için alternatif çözümler aramaktadır. Bu tezde çevrimiçi mobilya perakendeciliğine odaklanılmaktadır. Çevrimiçi mobilya perakendeciliğinde yaygın olarak kullanılan uygulama temelli artırılmış gerçeklik yerine web tabanlı artırılmış gerçeklik araştırılmıştır. Web tabanlı artırılmış gerçeklik müşterilere görsel ve interaktif bir deneyim sunmakla birlikte uygulama temelli artırılmış gerçekliğe göre daha ulaşılabilir ve kolaydır. Bu tez web tabanlı artırılmış gerçekliğin müşterilerin satın alma niyetine etkisini S-O-R model çerçevesinde ölçmektedir. Araştırma kapsamında 146 katılımcı ile yüz yüze anket yöntemiyle toplanan veriler, kısmi küçük kareler yol modelleme yöntemi kullanılarak yapısal eşitlik modellemesi ile analiz edilmiştir. Araştırma kapsamında web tabanlı artırılmış gerçekliğin karakteristik özelliklerinden olan etkileşim, canlılık ve güçlendirmenin mekânsal mevcudiyete, akabinde mekânsal mevcudiyetin karar konforuna ve nihayetinde karar konforunun satın alma niyeti etkisi incelenmiştir. Çalışma sonucuna göre tüm hipotezler desteklenmiş, satın alma niyetinin pozitif yönde etkilendiği görülmüştür.

Anahtar Kelimeler: Web tabanlı artırılmış gerçeklik, çevrimiçi perakendecilik, satın alma niyeti, mobilya perakendeciliği

Tarih: 20.07.2023

ABSTRACT

Evaluating the Effect of Web based Augmented Reality on Purchase Intention in the Online Furniture Retailing based on S-O-R Model

Online retailing is becoming more and more demanded by customers every year. Retailers are looking for alternative solutions to enhance the online customer experience and enable customers to make the right decision when choosing products or services. This thesis focuses on online furniture retailing. Web-based augmented reality is investigated instead of application-based augmented reality, which is widely used in online furniture retailing. Web-based augmented reality offers customers a visual and interactive experience and is more accessible and easier to use than app-based augmented reality. This thesis measures the effect of web-based augmented reality on customers' purchase intentions within the framework of the S-O-R model. Within the scope of the research, the data collected by the face-to-face survey method with 146 participants was analyzed by structural equation modeling using the partial least squares path modeling method. Within the scope of the research, the effects of interactivity, vividness, and enhancement, which are the characteristic features of web-based augmented reality, on spatial presence, then the effect of spatial presence on decision comfort, and finally the effect of decision comfort on purchase intention, were examined. According to the results of the study, all hypotheses were supported, and purchase intention was positively affected.

Key Words: Web-based augmented reality, online retailing, purchase intention, furniture retailing

Date: 20.07.2023

LIST OF ABBREVIATIONS

AR : Augmented Reality

ARA : Augmented Reality Advertising

ARG : Augmented Reality Games

ARIT : Augmented Reality Interactive Technology

AUG : Augmentation

CB-SEM : Covariance –based Structural Equation Modelling

DCM : Decision Comfort

INT : Interactivity

MAR : Mobile Augmented Reality

MTurk : Amazon Mechanical Turk

PIN : Purchase Intention

PLS : Partial Least Squares

QR : Quick Response

ROI : Return on Investment

SEM : Structural Equation Modeling

SOR : Stimulus – Organism - Response

SPT : Spatial Presence

TAM : Technology Acceptance Model

UEQ : User Experience Questionnaire

UK : United Kingdom

VIV : Vividness

Web-AR : Web-based Augmented Reality

WOM : Word of Mount

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1. INTRODUCTION

In recent times, advancements in technology and the ongoing digital transformation have significantly propelled the adoption and utilization of innovative technologies in the retail sector, particularly augmented reality. The incorporation and effective utilization of these emerging technologies hold great potential within the furniture retail industry. Web-based augmented reality has emerged as a novel tool in the furniture retailing sector, aiming to enhance consumer experiences, simplify purchase decisions, and foster customer loyalty.

The utilization of AR applications in the realm of e-commerce has gained significant momentum as it proves to be an effective method of enhancing the overall customer experience, resulting in its surging popularity. AR technology has found widespread applications across various industries, with the retail sector being particularly prominent in its adoption. AR is being employed in both physical retail stores and online shopping environments, providing customers with an immersive and interactive shopping experience. Traditionally, AR applications in retail have been delivered through mobile apps. However, research indicates that a substantial portion of customers, approximately 75%, do not engage with or reuse the AR apps they download on their smartphones (Varnalı, 2020). This reveals a potential limitation in the widespread adoption of mobile-based AR solutions.

To address this challenge, a promising solution known as Web-AR has emerged. Despite its potential to overcome the limitations associated with mobile-based AR apps, Web AR has received relatively limited attention in the existing literature. Web-AR enables users to access AR experiences directly through web browsers, eliminating the need for additional app downloads. This approach offers enhanced convenience and accessibility to customers, potentially leading to higher levels of engagement and utilization.

In addition to the growing prominence of AR in e-commerce, online marketplaces have emerged as significant players alongside traditional markets due to the widespread adoption of the internet in our daily lives. The advent of e-commerce has enabled middle- and small-sized businesses to access larger markets while simultaneously providing customers with a broader range of options (Deliçay, 2021). This shift towards online marketplaces has fundamentally transformed the retail landscape, creating new opportunities for businesses to reach a global customer base and for customers to enjoy the convenience of shopping from anywhere at any time.

Companies in e-commerce employ augmented reality, particularly on an application-based basis. The incorporation of augmented reality (AR) applications has become a vital asset for businesses operating across diverse sectors, encompassing footwear, eyewear, toys, literature, cosmetics, and beyond. However, the realm of augmented reality's potential within the furniture industry remains considerably underexplored, with a noticeable dearth of comprehensive studies in this area. The present corpus of study focuses mostly on the usage of augmented reality in the furniture sector via mobile apps, with the IKEA Place App acting as a prominent example. The purpose of this study is to look into the usage of Web-AR technology in the furniture sector and how it affects consumers' online purchasing intentions.

The study's main hypothesis is that web-based augmented reality would improve customer experiences and influence purchase decisions in the furniture retailing industry. To test this hypothesis, a series of experimental tests and survey data will be used, as well as statistical analysis.

The purpose of this thesis is to demonstrate the potential benefits of using web-based augmented reality as a marketing tool in the furniture retailing industry. This research aims to provide significant insights for companies in the furniture retailing sector to better understand the benefits of using web-based augmented reality to achieve an advantage over competitors when making strategic decisions.

There are seven main chapters in this thesis. In the introduction part, information was given about augmented reality, Web-AR, and furniture retailing in Turkey. In the second chapter, AR studies in the literature, AR studies in furniture retailing, and the stimulus-organism-response model are analyzed separately. The third chapter explains

the theoretical framework. The fourth chapter describes the research methodology. The fifth chapter presents the research findings. In the sixth chapter, there is a discussion of the results of the research. The seventh chapter contains the conclusion.

1.1. AUGMENTED REALITY

Augmented reality is a technology that augments reality by bringing virtual things into the actual world (Azuma, 1997). AR functions as a human-computer interface, delivering three-dimensional objects and real-time interactions created by computers employing numerous sensors (Hong, 2006). According to Olsson et al. (2013), augmented reality is a means of combining actual and computer-based digital information into one. Augmented reality is described as a technology that connects the virtual world with reality since it is frequently utilized to integrate virtual elements into the actual environment (Watson et al., 2018).

Customers are using more augmented and mixed reality-based applications as a result of recent advancements in mobile technology. Poushneh and Vasquez-Parraga (2017a) define augmented reality as a set of technologies that integrate virtual information with the real world. AR improves users' interaction with and perception of the real world.

Augmented reality is used in different areas of companies. AR in companies is used in marketing, as an experiential marketing tool, logistics, brand communication, as a multi-channel shopping experience provider, after-sales services, and retailing. In retailing, AR applications are used in three different areas: in-store, mobile retailing, and online retailing. This study focuses on the use of AR in online retailing. Pan and Chen (2010) argue that products presented in two dimensions in e-commerce do not provide enough information to customers in terms of dimensions, texture, and even appearance. Smink et al. (2019) suggest that the lack of sensory information, which they identify as one of the most important problems of online retailing, can be improved with the help of AR. Caboni and Hagberg (2019) argue that integrating augmented reality into websites in online retailing allows customers to have an immersive shopping experience without visiting the store.

Different devices are used to access augmented reality technology. Augmented reality has three different display units: hand-held displays, head-attached displays, and spatial displays (Bimber & Raskar, 2006). This study uses handheld display technologies as a tool to measure the impact of AR on customers' purchase behavior. Gervautz and Schmastieg (2012) argue that handheld displays are devices such as phones and tablets and are widely used. Bimber and Raskar (2006) state that the video cameras of devices such as phones and tablets combine the real environment with the virtual object. Goh et al. (2019) state that AR will increase the use of handheld imaging systems such as phones and tablets more widely and easily than monitor-based augmented reality imaging and will give a new direction to the prevalence of AR.

Finally, the historical development of AR is examined. When looking at the historical evolution of augmented reality, the Sword of Damocles, the first head-mounted display in history, was discovered in 1966 (Qiao et al., 2019b). The term of augmented reality in marketing first appeared in the 1990s. Azuma published the first article on AR in 1997 (Azuma, 1997). The first AR game, called AR-Quake, was introduced in 2000 (Qiao et al., 2019). AR was used commercially for the first time in 2008 for BMW's new Mini Cooper (Javornik, 2016b). AR technologies are used in numerous industries today, including retail, archaeology, architecture, urban planning, education, manufacturing, health, emergency management, search and rescue, video games, military, media, aviation, etc. (Boyles, 2017). According to McLean and Wilson (2019), augmented reality technology has existed for a long time, but the absence of suitable devices for augmented reality has prevented its growth.

1.2. WEB-BASED AUGMENTED REALITY

Web-based augmented reality is a novel technology that allows augmented reality apps to be accessed via a web browser (Kurt & Ince, 2020). This technology makes augmented reality more accessible and easier to use (Bal & Içten, 2019). Users do not need to download apps to use web-based augmented reality because it operates through a web browser (Bal & Içten, 2019). Web-AR works by making 2D and 3D material available via specific URLs in web browsers (Nitika et al., 2021). Web-AR technology is employed in a variety of applications, including education, tourism, cultural heritage protection, and virtual accessibility. Web-AR can be designed with tools like Three.js, A-Frame, AR.js, ARCore, ARKit, and more (Shepiliev et al., 2021). Web-AR technology provides users with an interactive virtual world experience, allowing them to execute operations such as zooming, panning, rotating, and navigating (Nitika et al., 2021b).

Web-AR refers to an augmented reality experience that may be accessed by scanning the QR code of the relevant product on a mobile device using a web browser instead of installing a mobile app (Web AR Definition: Augmented Reality Glossary, n.d.). Users do not have to download a mobile application to use Web-AR. One of the primary benefits of Web-AR is its ability to reach a larger variety of consumers because it can be utilized with a QR code on a browser. Web-AR technology is expected to exceed the limits of application-based AR applications as it can be easily used by different devices, is fast, and has the potential to spread among users easily (Zhang et al., 2017). Furthermore, Meydanoğlu et al. (2015), in their study on QR code usage, suggest that customers scan the code for curiosity and information purposes. The QR code experience provided by Web-AR has the potential to improve customer adoption of AR technologies.

Web-AR technology can be used in many different areas. Web-AR is used for web-based visualization of cultural heritage. Web-AR technology provides a large collection of photos that may be utilized as a data source for digital cultural heritage documentation (Uslu & Uysal, 2021). Furthermore, Web-AR technology may be leveraged to make course materials more interactive for students. For instance, three unique resources centered on important topics relating to first aid in traffic with the help of Web-AR were created for pupils with autism spectrum disorder (Özcan et al., 2022).

Virtual dressing apps may also be employed with web-AR technologies. A web-based virtual dressing application using augmented reality technology was effectively achieved in research by Bal and Icten (2019), and user feedback and satisfaction levels were acquired with a prepared scale, and successful results were reached with a well-exposed marker. Another sector where Web-AR technology is used is the tourism sector. This technology allows tourists to engage with tourist attractions (Nitika et al., 2021).

FIGURE 1.1: Example of Web-based Augmented Reality
Source: https://www.threekit.com/blog/apple-ar-for-businesses

Goh et al. (2019) suggested that AR will be used more widely and easily through smartphones. But current AR applications are generally app-based augmented reality. Varnalı (2020) claims that 75% of users who download an AR-based application on their phone do not use the application afterward. The fact that Web-AR technology does not require an application and provides an AR experience to users with the QR code reader on smart devices reveals that it is a potential technology for the spread of AR.

1.3. FURNITURE INDUSTRY IN TURKIYE

The beginning of the furniture industry in Türkiye dates back to the 19th century (İnal & Toksarı, 2006). Especially with the effect of migration to big cities, the need for furniture in Türkiye is increasing day by day (Köksal, 2017). In the 1970s, many medium and large furniture enterprises were established due to the increasing demand for furniture (Demirci & Efe, 2006). The furniture production realized in the world in 2020 is approximately 473 billion dollars. China, the USA, Germany, and Italy account for 53.3% of world furniture production. Türkiye's share in furniture production is between 1% and 2%. (Sanayi Bakanlığı, 2020).

Sales of furniture in online channels have surged as a result of the popularity of online commerce (Kolay İhracat Platformu, 2021). It is estimated that Türkiye will rise to the first place in the world ranking in e-commerce in the coming years (Statista, 2021). In 2021, overall e-commerce volume in Türkiye increased by 69% over the previous year, reaching roughly 382 billion TL. E-commerce accounts for approximately 18% of the total volume of the retail sector. In 2021, 53% of sales in different product groups in online retailing were realized via mobile, while 47% were realized via web. However, when furniture retailing is analyzed, it is revealed that 85% of customers use the web and 15% use mobile when purchasing products (Türkiye e-ticaret ekosistemi raporu, 2021). While examining the impact of web-AR on furniture retailing, the starting point of the study is not only that web-AR is less costly than mobile AR applications, but also that customers are more to use browsers to buy furniture in Türkiye. The Turkish Ministry of Trade has recognized augmented reality applications in online furniture retailing as one of the industry's future trends (Kolay İhracat Platformu, n.d.).

The AR-supported IKEA Place App, launched in 2017 by the world's leading furniture manufacturers IKEA, was the one of example of AR use in furniture retailing. Later, researchers carried out different studies on the AR-supported IKEA Place App. For instance, in the study conducted by Rauschnabel et al. (2019) on the use of AR in the furniture industry, it is claimed that IKEA Place app strengthens customers' brand perception towards IKEA. AR technologies, which have just started to be used in furniture

retailing, have the potential to strengthen the industry even more by improving the perception of customers toward online furniture retailers.

The furniture sector is one of Türkiye's major export items. The sector becoming more efficient both in international markets and in the domestic market will contribute to the Turkish economy.

2. LITERATURE REVIEW

Augmented reality has been used as a promising technology with the potential to revolutionize the retail business by enhancing the consumer experience in physical and online establishments. As customer expectations grow, merchants are increasingly turning to AR technologies to provide immersive and engaging experiences that span the digital and physical worlds. This literature review intends to investigate existing studies on the use of AR in retail, with an emphasis on the influence of AR on customer behavior, acceptability, and purchase intention. This review provides a complete grasp of the state of knowledge, identifies research gaps, and recommends prospective directions for future study by combining and evaluating the important results of prior research. Understanding the function of augmented reality in retailing is crucial. The literature is examined in this study in three main sections.

The first section examines research on the usage of AR in various product categories in retail. These studies investigated the influence of AR on customer acceptability and purchase intention using diverse theories and approaches. Cosmetics, eyewear, toys, autos, novels, and other study disciplines have all contributed to the literature, both academically and managerially. Examining this research shows several viewpoints on how AR is utilized in retail and how customers react to it. This chapter reviews research that looks at the implications of augmented reality in retail on customer behavior between 2010 and 2021.

The second section includes research on the usage of augmented reality in retail based on the S-O-R model. The S-O-R model is one example of a popular model for studying the effect of the shop environment on consumer behavior. Since the 2000s, the S-O-R model has also been used to investigate the influence of websites on customer behavior inetail. In this context, research has been carried out to determine the stimuli

that affect customers in emerging technologies such as AR apps, as well as to investigate aspects of customers thinking about stimuli. It is vital to understand how AR has been addressed in prior research in the context of the S-O-R model employed in this work.

The third section presents research on the use of augmented reality in the furniture industry, which is the subject of our study. Customers want to constantly see, touch, and evaluate products such as furniture. Online furniture sales can thrive with innovative technologies such as AR that address customers' concerns. In furniture retailing, AR research has focused on mobile AR applications. The IKEA Place app has been at the forefront of both the furniture industry and academia since its launch in 2017. This study investigates the impact of web AR, a new type of augmented reality, on the furniture trade. To examine the impact of web-based AR technology on customer behavior in furniture retailing, it is essential to review previous research on app-based AR in furniture retailing.

As a result, augmented reality applications may have great potential to improve customer experiences in retail. Through a review of previous studies, this section highlights research to understand the use of AR in retail and customer response. It also tries to emphasize that studies using the S-O-R model, which is the model of the research, provide an important basis for understanding the effects of AR by reviewing previous studies. Studies examining the use of AR applications in furniture retailing have contributed both scientifically and managerially to the industry.

2.1. AUGMENTED REALITY ON LITERATURE

Augmented reality has emerged as a game changer with far-reaching consequences for marketing strategy. Businesses are increasingly investigating the possibilities of augmented reality to engage and fascinate consumers as the lines between the physical and digital worlds continue to blur. The purpose of this literature review is to offer a complete overview of existing research on augmented reality in marketing, including uses, impacts, and implications. These studies, which focus on the applications of various products and firms, give thorough information on the usage of augmented reality technology in shopping.

Bulearca and Tamarjan (2010) directed four different groups to Glasses Direct's AR-enabled website to try on virtual glasses. Each focus group had five to six participants aged between 18 and 30. The study was conducted in the UK. According to the results of the study, influencing enjoyment and enhancing conviction appear to be advantages of AR. In contrast, there is no effect on participants' brand attitudes. At the same time, participants stated that the AR-supported website was difficult to use and that not being able to touch the product was a disadvantage.

Eyüboğlu (2011) conducted research on Banana Flame's AR-enabled website with a focus group of 14 female students in Türkiye based on Bulearca and Tamarjan's (2010) study. Banana Flame is a fashion company that offers virtual dress fittings on its website. According to the results of the study, participants stated that AR is time-saving, practical, and fun. However, some participants said that it was not like the real experience, and they were not sure whether the clothes fit them or not. According to the participants' statements, it was emphasized that AR would increase WOM.

Ganapathy et al. (2011) conducted both a focus group and a survey study with a group of 12 people to investigate the preference of food products with an AR-enabled mobile phone. The study conducted in the shopping center focused especially on the informative aspect of AR. According to the results of the study, AR seems to be particularly useful for expensive food products as they can be examined in more detail.

Olsson and Salo (2011) investigated the adoption of AR by users. The research was both qualitative and quantitative for a group of 90 people of different nationalities in Finland. According to the results of the study, participants gave balanced answers about the strengths and weaknesses of AR. Olsson's (2012) next study presents five different AR scenarios to a group of 260 students. Users found the on-the-bus, jogging, and shopping for furniture scenarios useful and helpful. However, they stated that the availability of too much information rather than the necessary information reduced their trust. Participants were not motivated to use AR in the other two entertainment-oriented scenarios (street art and virtual mirror). Olsson et al. (2013), in their further work, focus on how Mobile AR applications will be accepted by users. According to the results of the study, mobile AR applications will be accepted by users if they fulfill their functional and emotional expectations. Functional expectations include factors such as performance and

efficiency, while emotional expectations include factors such as playfulness, enjoyment, vividness, etc. Salo et al. (2013) conducted a qualitative experiment with a group of 107 participants using the critical incident technique. It was investigated which values of the users come to the fore when using AR. According to the results of the study, it was observed that excellence and utilitarian efficiency came to the forefront.

Huang and Liu (2014) conducted a quantitative and qualitative study about the extent to which narrative experiences, media richness, and presence influence the user's experience of augmented reality interactive technology (ARIT). 30 students and 344 consumers participated in the study on virtual dresses at ARIT. The study investigated which of the three stimulus factors created greater value in customers' perceptions of aesthetics, playfulness, consumer ROI, and service excellence. According to the results of the study, it was concluded that perception narrative was more effective than other stimuli.

Kang (2014) conducted a quantitative study of 806 consumers based on mention capture technology related to augmented reality. The value-attitude-behavior model and prospect theory were used together in the study. Researchers asked participants questions about four values, respectively: Monetary value, convenience value, emotional value, and social value. The attitude section of the study concludes a positive correlation between the aforementioned values and utilitarian performance expectancy. Values excluding monetary value and their relationship with hedonic performance expectancy were found to be negative. However, the relationship between hedonic performance expectancy and monetary value is not investigated due to prospect theory. The researchers claim that consumers tend not to enjoy the exhibited technology since it is novel. There are two moderator impacts between utilitarian performance expectancy and usage intention. Those can be counted as ego involvement and cognitive effort, which influence the user's intention, although not heavily.

Poncin and Mimoun (2014) use toys as their research focus, and their field experiment involves 140 participants. The study reveals positive findings concerning the scrutiny of the impact of in-store use of AR over atmosphere. Moreover, the study, which was enabled via Magic Mirror with AR and interactive game terminals, focuses on customers' emotional reactions and their impact on perceived shopping value. Customers'

positive store perceptions increased positive store experience. In particular, magic mirrors with interactive game terminals led to stronger perceptions of utility.

Spreer and Kallweit (2014) focus on the effects of AR use through books. Moreover, the study is conducted with 96 participants. The use of augmented reality in book sales in one of Germany's leading bookstores was investigated. The study found that augmented reality offers both benefits (information about the book) and enjoyment to customers, especially at the point of purchase. However, no effect was observed concerning the ease of use of the technology.

Huang and Liao (2015) conducted a labor experiment to scrutinize AR in clothing with a total of 220 students. One of the worth-mentioning studies in the literature examines whether customers can develop sustainable relationship behaviors towards the use of ARIT through customers with different levels of innovativeness. Hence, the study claims that for low-cognitive innovative customers, the most positively influenced variable from the perceived ease of use is sustainable relationship behavior. Additionally, perceived playfulness has a greater positive effect on high-cognitive innovative customers than on low-cognitive innovative customers. Furthermore, for highly cognitively innovative customers, perceived aesthetics and service excellence have a greater positive effect on sustainable relationship behavior than other variables.

Hopp and Gangadhorbatla (2016) conducted quantitative research on the automotive sector and AR, which has 96 consumers. The study reveals that the operational use of AR in commercials and the attitude towards it exist, with an emphasis on the brand's attitude. The researchers conclude that the more information consumers have on AR, the more positive feedback there is concerning the brand's attitude. The study conducted on Augmented Reality Advertising (ARA) observed that exposure time negatively affected participants' attitudes towards ARA. Moreover, it suggests that participants with high technological self-efficacy maintained their negative attitude towards ARA, which also led to a negative attitude towards the brand.

Javornik (2016b) conducted research on the use of AR in the furniture and glasses sectors with 60 students. Javornik (2016b) argues that AR differs from the definition of "another interactive technology" and that the augmentation construct should be used to examine consumer behavior in AR studies. The study argues that the augmentation

perceived by the customer corresponds to the consumer's understanding of the features provided by AR. It claims that AR features do not increase perceived interactivity.

Kim and Hyun (2016) conducted a field experiment about MAR in which 120 students participated. The study, which enables the use of two TAM models, investigates the mediating effects of usefulness and telepresence separately. It claims that system quality and information quality have an effect on telepresence. However, service quality has no effect on telepresence. The study also argues that telepresence has a full mediation effect. Moreover, there are three different types of quality that have influence over usefulness: system quality, information quality, and service quality. In addition, usefulness and telepresence had an impact on reuse. The theoretical conclusion of the study is that usefulness can be used as a substitute for telepresence. Usefulness has a stronger relationship with system quality and information quality than telepresence. Information quality has a weak relationship with both mediators. However, usefulness interacts more strongly than telepresence.

Mauroner et al. (2016) created a labor experiment with 120 consumers concerning commercials that include AR technology. In the commercials consisting of AR, the perceived interactivity of consumers is shown to be higher in comparison to conventional commercials that do not include AR. Interactivity has a positive effect on brand recognition and the attitude of consumers towards commercials. Additionally, participants stated that the AR commercials are innovative and trustworthy.

Yauyuneyong et al. (2016) conducted a quantitative study concerning the effectiveness of AR ads in comparison to conventional and QR code ads via a labor experiment with 77 consumers. Eight different constructs were used in the study. AR ads were rated higher by users in terms of novelty, ad effectiveness, and informativeness when compared to other ads. In the evaluation phase, AR ads scored higher than the other aforementioned types of ads with respect to attitude towards the ad, entertainment, and advertising value, yet there was no significant difference between them. The study does not show any difference between all ad types in terms of irritation or time effort. Consecutively, QR code advertisements were the least evaluated advertisement type. As a result of the study, although AR ads were evaluated as "better than 7 other ads", when consumers were asked which type of ad they preferred, traditional ads were the most

preferred. In the study, this was attributed to the fact that consumers are not aware of some needs (Haire 1950; Schlackman 1989a; Schlackman 1989b).

Dacko's research (2017) explores the potential of mobile augmented reality applications to create value for customers and retailers, ultimately finding that their use has a positive impact on the retail industry. Mobile Augmented Reality applications can change consumer behavior and have a major impact on the retail industry. The study found that MAR apps were associated with improved merchant ratings. In addition, the MAR app has achieved high levels of user satisfaction due to its ability to provide a more interactive and engaging shopping experience. These apps also benefit retailers as they provide a competitive advantage and potentially offer unique and innovative shopping experiences. Despite some limitations, such as technical issues and accessibility challenges, MAR applications are expected to continue to gain widespread adoption in the near future.

Hilken et al. (2017) conducted a quantitative study on AR and MAR in eyewear and cosmetics with 750 students. In the study, simulated physical control and environmental embedding, which are AR service augmentation variables, have an effect on utilitarian and hedonic values. This effect is mediated by spatial presence. Likewise, there is an interaction between spatial presence and decision comfort. However, the relationship between spatial presence and decision comfort is relatively weaker for participants with high awareness of privacy. The study particularly focuses on the effect of spatial presence on decision comfort and its mediating role.

Huang and Liao (2017) conducted a quantitative study with 336 students about dress on AR. The study discusses which ARIT features and psychological states lead to multisensory flow experiences based on virtual limonoid theory. In the part of the model that encompasses Virtual limonoid theory, the multisensory features of ARIT "self-location and haptic imagery" are modeled into decorating psychological states. Furthermore, decorating psychological states consist of a sense of body ownership, ownership control, and Self-explorative engagement. All constructs of decorating psychological states had a positive effect on concentration, playfulness, time distortion, and exploratory behavior that make up the flow experience. Participants were positively affected in terms of spending more time in ARIT and satisfaction.

Kim et al. (2017) conducted a quantitative study on Smart in-Store Technologies with 567 consumers. In the study, the virtual mirror, socially interactive dressing room, and RFID music tag used in the store were analyzed based on the TAM model. TAM belief constructs can be counted as perceived ease of use, perceived usefulness, and perceived enjoyment. In the research using a virtual mirror and an RFID music tag, perceived usefulness and perceived enjoyment affected attitudes. In the research using a socially interactive dressing room, only perceived enjoyment affected attitudes. As the ultimate outcome, the study concludes that perceived enjoyment is more significant than perceived usefulness to ensure a positive attitude towards Smart In-Store Technologies (SIST).

Pantona et al. (2017) use glasses as their research focus, and their labor experiment involves 318 students. The study with virtual try-ons compares the Italian and German markets. In the study, the relationship between the features considered characteristics of AR and TAM beliefs was investigated. There are various relationships between differing variables to be investigated, such as the relationship between response time and quality of information and perceived usefulness, the relationship between interactivity and aesthetic quality and ease of use and enjoyment, the relationship between TAM belief variables and attitude, and then the relationship between attitude and behavioral intention. According to the results of the study, response time and quality of information have a positive influence on perceived usefulness in both countries. Furthermore, it shows that Italy is more willing to go to the store for a virtual try-on, while Germany is more hesitant than Italy in this regard.

Poushneh and Vasquez Parraga (2017a) formed seven different groups of 70 customers for seven different AR applications. Five of the groups used entertainment services with AR (e.g., Night Sky, Space Journey), while the remaining two groups used two different virtual and augmented reality applications of Ray-Ban. After using the application, the participants answered the questionnaire and open questions and then shared their expected and actual experiences. The higher the difference between the participants' expected and actual AR experiences, the lower the satisfaction, and higher satisfaction levels in a vice versa situation.

Poushneh and Vasquez Parraga (2017b) use Ray-Ban glasses and a virtual model as their research focus, and their labor experiment involves 99 students. The study concluded that AR enhances the customer experience. AR allows customers in the virtual environment to interact more with virtual information, which in turn creates higher usage satisfaction and purchase intention in the customer.

Vonkeman et al. (2017) use glasses as their research focus, and their labor experiment involves 212 students. The study examines the impact of consumers' perceptions of product presentation on online impulse buying. Interactivity and vividness have a high impact on local presence. In addition, the term local presence is used for the first time in this study. Local presence affects product risk and product affect and increases impulse buying. The conclusion is that the applicability of the stimuli of the store atmosphere in the online environment will increase the impulse to purchase, which is supported by the theory of impulsive behavior.

Yim et al. (2017b) use watches and glasses as their research focus, and their labor experiment involves 1059 students. In the study, a comparison was made between a traditional website and AR. The study observed that AR increased purchase intention compared to the conventional website. To add to that, the effects of interactivity and vividness on immersion were examined, and the research suggests that AR was more effective than the website.

Brengman et al. (2018) use furniture as their research focus, and their labor experiment involves 277 students. According to the results of the study, AR applications create more perceived ownership in participants than cell phones with touchable screens or laptops with non-touchable screens. High perceived ownership positively affected attitudes towards products and purchase intentions. In the study, which was conducted on two different product groups, material products (e.g., armchairs) had more perceived ownership than geometric products (e.g., vases).

Beck and Crie (2018) use dresses and glasses as their research focus, and their labor experiment involves 241 consumers. The study implements an online virtual fitting room in both offline and online channels and observes the effect of the participants' purchase intentions in both environments. According to the results of the study, VFR

affects exploratory behavior and purchase intention in both environments compared to an e-catalog.

Poushneh (2018) uses glasses as a research focus in their labor experiment, which involves 409 students. In the study, a qualitative study was conducted to improve the augmentation quality scale. In addition, an experimental study was conducted on 409 customers on the AR using customers' concerns about access to personal data and how augmentation quality affects customer satisfaction. Applied equity theory was used in the study. According to the results of the study, it is understood that customers attach importance to both personal data privacy and augmentation quality, especially the autonomy to control access to personal data, which increases customer satisfaction.

Rauschnabel et al. (2018) conducted quantitative research where 201 consumers were surveyed with respect to MAR. Through an exploratory model, the study investigates whether the new technology of wearable devices will be accepted by customers. Smart, wearable glasses are mostly preferred for functional reasons. The study aims to measure adoption intention. Augmented reality games (ARGs) elicit different motivations among consumers, delivering an immersive gaming experience. These motivations can include practical benefits, pleasure-seeking benefits, and symbolic benefits. However, the extent to which ARGs may compromise the privacy of others is a crucial factor in users' decision-making processes. A qualitative follow-up study has uncovered multiple explanations for this surprising privacy concern, highlighting that ARGs are becoming increasingly aware of this issue.

Heller et al. (2019) use Amazon's AR View application in their research. Five different studies were conducted for five different groups, and Mental Imagery Theory was used. In the first study, a survey was conducted among 304 university students to investigate whether AR supports the mental imagery process. The second study was conducted on 238 Amazon Mechanical Turk (MTurk) participants to measure the regulatory effect of mental imagery processes. The third study was conducted on 214 MTurk participants to investigate the regulatory effect of the product. The fourth study was conducted to investigate the novelty effect of AR on 100 MTurk participants. The fifth study was a field study conducted on 158 participants to investigate the impact of AR on consumers' product preferences and spending. As a result, the study concludes that

bringing products that are suitable for the real environment, such as armchairs, to the environment with AR is more effective than bringing products that are not suitable for the environment, such as "food". Furthermore, Heller et al. find that AR facilitates the decision-making process, facilitates customers' product selection, and increases their spending.

Kumar's (2021) literature review on the use of augmented reality in online retailing highlights the significant impact of AR characteristics on various factors such as perceived risk, experiential value, utilitarian value, and hedonic value. This leads to a positive attitude, assists in decision-making, and influences the behavioral intentions of customers. According to the results of the study, the characteristics of augmented reality applications significantly influence utilitarian benefits, hedonic enjoyment, perceived risk, and experiential value, ultimately leading to a positive attitude, decision-making assistance, and behavioral intentions. The customer experience (flow, mental imagery, spatial presence, and immersion) also plays a mediating role in this model.

Chen et al. (2021) present a synthesis of academic research on augmented reality in retail. Three primary areas of research and theoretical foundations were highlighted by the study: AR user experience design and attributes affecting consumer behavior, AR shopping experience and value theory, and factors and technology acceptance models based on AR acceptance several research techniques from the marketing/management and human-computer interaction fields are used to perform this systematic literature review. The resultant SOR-based conceptual framework underlines the sensory and functional components necessary for successful consumer augmented reality (AR) experiences. Retailers aiming to engage customers with a better shopping experience and make AR apps profitable may put the framework in place. This study combines diverse viewpoints and research methodologies to provide the first comprehensive literature review on AR in retail.

Nikashemi et al. (2021) conduct research on the influence of retail use of mobile augmented reality applications on intention. The study's findings indicate that the quality, dependability, interactivity, customizability, and vividness of an augmented reality app impact people's perceptions of the benefits of augmented reality. Similarly, perceived functional and hedonic advantages were found to have a beneficial influence on users'

desire to use applications and willingness to pay extra. This study also found that the modulating roles of perceived adaptability, functional usefulness, and hedonic utility factors on app interest did not have a linear impact. Furthermore, psychological motivation was found to have no linear influence on the desire to spend more. According to the study, augmented reality apps have a high potential to pique user attention and improve engagement.

As a result, it has been observed that augmented reality applications in different product groups positively affect the purchasing behavior of customers. In light of previous studies, it can be stated that augmented reality is an innovative technology that affects customer behavior in retailing.

2.2. AUGMENTED REALITY IN FURNITURE RETAILING

The literature on the further applications of augmented reality is responsive to fruitful research yet very limited due to the novelty of the technology. Moreover, the literature specialized in the use of augmented reality in the furniture sector has a wide range of benefits to offer the sector, but it is still in its emerging phase.

Rese et al. (2014) follow a different method in their study on customer acceptance of AR applications. Instead of collecting survey data for the traditional TAM model, researchers model customers' comments on the IKEA Place APP according to TAM constructs and scrutinize the relevant data with the SEM Model. The results of the study show that customer comments can be used instead of surveys.

Öztürkcan (2017) examines the IKEA Place App, which was launched in September 2017. The study discusses IKEA's attempt to solve customer problems with its new augmented reality-supported application, which recognizes the problems customers experience when buying furniture. The study concludes that the IKEA Place App creates service-centered value for customers.

The study conducted by Stumpp (2019) researches the relationship between user experience and AR use through the comparison of IKEA’s AR application app called the

IKEA Place App and the conventional IKEA website. To do so, the study divides the sample of 56 students into four groups via A/B testing to later survey the participants with the User Experience Questionnaire (UEQ) with six scales: attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty. The study suggests that there is a direct correlation between enhancing new technology and brand success, which can be achieved through user experience. It should be noted that there are various definitions of the user experience throughout the literature. Stumpp's study refers to the 2010 definition of the International Organization for Standardization, where prior, current, and post-reflections of a user exposed to a touchpoint translate as perceptions and reactions. The study notes that the sample group commented with respect to their experiences with the IKEA Place App as "easy, novel, realistic, and fast However, it was difficult to control at first and not quick to find an object. According to the study, on every scale, the IKEA Place App scores higher, which results in a higher user experience, with especially high scores in perspicuity and dependability. Furthermore, stimulation and novelty are the dimensions in which AR apps perform better. The study illustrates that the use of AR technology in the furniture sector increases the user experience by yielding interaction and creating new and higher stimulation.

Rauschnabel (2019b) argues in his study that AR applications change the customer's brand perception. IKEA Place and Tunnel apps were used in the study. How customers perceive the features of AR apps (utilitarian and hedonic benefits) and augmentation quality was investigated as well as consumer inspiration and attitude toward the AR App mediating construct. The study argues that marketers should emphasize inspiration in the use of mobile AR apps.

McLean and Wilson (2019) investigate the effect of augmented reality mobile retail apps on customer satisfaction and the desire to reuse. The research makes use of mobile applications from Amazon, IKEA, and Asos. According to the study's findings, good customer views of these apps boost brand loyalty, increasing consumer happiness and reuse intention. Brands can give unique and engaging experiences to consumers using augmented reality mobile applications, increasing happiness and retention.

Smink et al. (2020) look at the aspects that influence people's perceptions regarding augmented reality shopping apps. The purpose of this study is to contrast

participants' augmented reality experiences with cosmetic and furniture businesses with their standard mobile app experiences with the same brands. The primary goal of the study is to comprehend the influence of augmented reality apps on users. According to research, augmented reality applications are seen as providing a more customized virtual experience for both companies. Furthermore, in the case of augmented reality beauty items, the perceived personalization feature was discovered to be the factor that most affected purchase intention. On the other hand, the application of augmented reality by a furniture manufacturer discovered that telepresence which provided a virtual experience had the greatest impact on purchase intention. These results contribute significantly to our understanding of how augmented reality retail applications affect users. As a result, consumers' purchasing intentions may be influenced by the capacity of augmented reality apps to create customized virtual experiences.

Haumer et al. (2020) investigate the effect of IKEA's augmented reality applications on purchase intent. Augmented reality experiences were discovered to affect brand equity through brand affinity, brand awareness, and brand awareness elements in this study. It was also discovered that augmented reality experiences had both an indirect and direct influence on purchase intention via brand recognition and loyalty. The purpose of this study was to determine the effect of augmented reality experiences on brand equity and purchase intent.

Jessen et al. (2020) compare experiences on the IKEA website and augmented reality applications to examine the influence of augmented reality on user satisfaction. According to the findings, augmented reality experiences boost customer involvement and inventiveness, resulting in better levels of pleasure. As a result, augmented reality technology has the potential to boost customer happiness by offering more innovative and participatory experiences. These findings show the opportunity for businesses to adopt augmented reality apps to deliver more fulfilling and connected experiences to customers.

Kowalczuk et al. (2021) compare IKEA's web-based product presentation with IKEA's AR application, the IKEA Place App. In the study conducted with 398 students, 190 students used the IKEA mobile website, while 208 students used the AR-enabled IKEA Place app. According to the results of the study, IKEA's web-based product presentation was considered stronger in terms of media usefulness, while the IKEA Place

App was stronger in terms of immersion and enjoyment. The researchers also built Javornik's (2016a) outcome, which states that AR elicits affective, cognitive, and behavioral responses, as the model of the study and analyzed their relationships with each other.

Qin et al. (2021) explore the influence of augmented reality elements on mobile shopping purchase intention. The study is based on IKEA experimentation and an augmented reality software called Rayban Try-on. The study's goal is to determine the influence of these applications on customer behavior. The findings of the experiments demonstrate that the perceived interactivity of augmented reality apps impacts characteristics such as hedonic happiness, reasonable satisfaction, information content, and usability. Above all, customers appreciate the interaction provided by mobile applications, which deliver functional pleasure, a better information retrieval experience, and a simpler usage procedure. However, it was discovered that perceived virtuality had no effect on other characteristics other than usability. In other words, customer impressions of the virtual environment for augmented reality experiences have just a minor impact on usability evaluations. Furthermore, the research findings demonstrate that consumers' views regarding apps are influenced by their hedonic happiness, pragmatic satisfaction, and perception of information from applications. However, simplicity of use has no effect on sentiments regarding applications. These findings will help researchers better understand the influence of augmented reality applications on customers in the context of mobile purchasing. To summarize, augmented reality applications are expected to be favorably welcomed by customers and may have a favorable influence on their purchasing inclinations.

Ramdani et al. (2022) conducted a study on 383 participants in Indonesia to understand the impact of augmented reality applications on furniture retailing and consumer behavior. As a result of the study, it was suggested that AR has a positive effect on consumer perception. In addition, trust in AR and perceived functional benefits have a direct effect on attitudes towards AR. Moreover, these two constructs have an indirect effect on intention to adopt AR.

It is seen that application-based augmented reality tools, especially the IKEA Place App, have been used in the studies on furniture retailing related to augmented reality

technology to date. Studies have shown that customer behavior is positive toward app-based augmented reality. In some of these studies, IKEA's standard website was compared with the IKEA Place App, and it was revealed that customers had more positive attitudes towards the IKEA Place App (Raska & Richter, 2017; Stumpp, 2019; Jessen, 2020; Kowalczuk, 2021). This study aims to contribute to the literature by investigating the impact of web-based augmented reality on customer behavior.

2.3. STIMULUS – ORGANISM - RESPONSE MODEL ON LITERATURE

Stimulus Organism Response (S-O-R) theory has its foundations laid in the approach-avoidance model of Mehrabian and Russel (1974). In the book titled "An Approach to Environmental Psychology" researchers study the impact of environmental stimuli on emotional responses, which eventually trigger behaviors. According to the study, any emotional condition can be defined under the core matrix of emotional responses, which comprises pleasure, arousal, and dominance.

In this study, based on the S-O-R model, customers' purchase intentions will be measured through web-AR technology. First, the S-O-R model is explained, and the use of the S-O-R model in the marketing literature will be discussed.

2.3.1. History of S-O-R Model

For a better understanding of the theory used in the study, the first emergence of the theory in the field of psychology should be examined. (Mehrabian & Russel, 1974) Some studies before the S-O-R model was introduced were based on the stimulus-response model. However, since these studies did not include the organism part, they ignored how stimuli affect people's intellectual and emotional processes and how these processes are transformed into responses. Previous research in environmental psychology primarily demonstrated interest in the correlation between external (environmental, in that sense) stimuli and emotional responses. Scholars conducted research on the effects

of temperature changes on freshness. Half a decade ago, scholars investigated the annoying effects of sonic booms. However, the impact of external stimulation is not constrained by emotional response, where stimuli create a domino effect on behavior as a variety of emotional reactions lead to different behaviors. Mehrabian and Russel (1974) criticize previous studies of environmental psychology, claiming the mentioned studies lack experimental control.

Modality variables are responsible for the stimulation of emotional responses. An indefinite number of variables under various circumstances can be yielded to scrutinize the stimuli's impact on emotional response; nevertheless, the selection of variables for the thesis is in alliance with previous efforts in marketing literature. Emotional responses are direct reactions to stimulation. Mediating variables (pleasure, arousal, and dominance) may be presented in variety with respect to features of modality variables. All three emotional responses can be understood as a bipolar continuum parallel to each other. As they do not have an intersection point with each other, different levels of each may refer to peculiar reactions. Mehrabian and Russel (1974) explain the relationship between different levels of emotional response and reactions as "... Thus, for example, the feeling of boredom or fatigue may be described as one that is low on pleasure, arousal, and dominance. On the other hand, excitement may be characterized as an emotional state of high pleasure, arousal, and dominance. Anxiety and stress score high on arousal but low on pleasure and dominance. Relaxation, contentment, and comfort are rather high on pleasure and dominance but low on arousal (Mehrabian and Russels, 1974, p. 17)."

Arousal is the state of being awake, fully aware, and responsive to the stimuli of the environment. Many researchers define arousal as the opposite of sleep. Furthermore, pleasure can be defined as an emotional response to enjoyment. As the third emotional response, dominance refers to the sphere of freedom of the subject without any spatial and temporal constraints on possible behavior.

Revealing various behaviors may mean that physical stimuli have an effect on simple emotional responses. For this reason, the physical stimuli of the AR technology mentioned in the study affect the customer's purchase intention with their unique effects on pleasure, arousal, and dominance. However, when explaining this relationship, it should be taken into account that the stimuli of the phenomenon do not act independently

and therefore cannot be observed independently. It is not possible to isolate selected AR features and will not contribute to the study. Moreover, these stimuli, whose effects are variable in various amounts and combinations, also react to the concepts of time and space. In addition, the subject's prior exposure to the stimulus may also have a positive or negative effect on emotional response and behavior.

All these factors should be included in the study by calculating the information rate to ensure correlation, and the study should be verified. According to Mehrabian and Russell (1974), a high Information rate means a high level of arousal. In this case, it can be claimed that the information rate is high considering the mentioned features of AR technology, the fact that it is a new technology, and the low exposure of customers in temporal and spatial dimensions. In this case, it can be deduced that the effect on arousal will increase, which will have a positive effect on purchasing behavior. To test this hypothesis in the study, an information rate calculation will be made based on the studies of Mehrabian and Russel (1974).

As seen in the Figure 2.1, environmental stimuli affect the organism, and this effect turns into avoidance or approach behavior.

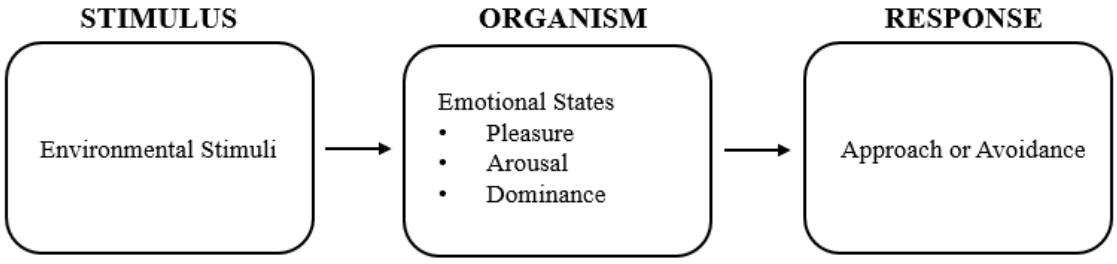

FIGURE 2.1: Stimulus - Organism - Response Model
Source: Mehrabian and Russell (1974)

2.3.2. S-O-R Model in Marketing

The S-O-R model in marketing was developed by Housten and Rothschild (1977). According to Slama and Tashchian's study (1987), the developed paradigm links the individual, the state of the individual and the environment, and the individual's decision-making processes. Watson et al. (2018) state that the S-O-R model is used especially in experimental retailing processes to discover the stimuli that trigger customers and to understand customer behavior.

When examining customer behavior in marketing, the S-O-R Model is a frequently used theory in which the effects of both the stimulating elements of the in-store atmosphere and the elements of the website are observed. The S-O-R model has been frequently used by researchers in retailing, especially on the impact of in-store atmosphere on customer buying behavior. With the popularity of e-commerce since the 2000s, the S-O-R model has been used by researchers to examine customer behavior in the digital environment and understand how website designs affect customer buying behavior.

Some studies on in-store atmosphere based on the S-O-R model are examined. In-store atmospheres are deliberately designed environments to attract customers' attention and ensure the purchase of products (Kotler, 1973). There are many studies based on the S-O-R model, especially to examine the store environment. Baker et al. (1992) argue that the social dimension and ambience of the in-store atmosphere increase consumer satisfaction and willingness to take action, which positively influences purchase. Wakefield and Blodgett (1994), on the other hand, argue that perceived crowding negatively affects consumer excitement, but perceived quality excites the consumer, which increases satisfaction and the desire to return to the store. Spangenberg et al. (1997), unlike other senses, consider the smell in the store as an element of ambiance and argue that it increases consumer satisfaction. Moreover, they claim that increased satisfaction positively affects the number of products examined in the store, the desire to return to the store, and the purchase intention. Chebat and Michon (2003) argue that smell increases customer satisfaction and willingness to take action, which positively affects the customer's spending level. Hul et al. (1997) maintain that in-store music positively

affects the customer's emotional appraisal and leads to an approach response. Bellizzi and Hite (1992) claim that the color blue activates the customer and has a positive relationship with purchase intention. They also argue in their study that the color red negatively affects the customer, postpones the purchase, and reduces the customer's interest in the store.

As a result, studies have investigated how stimuli such as ambiance, crowd perception, smell, music, color, product quality, and social dimension affect customer behavior in a store atmosphere.

With the emergence of retailing, especially on the internet, researchers have conducted some studies to examine the effects of website design on customer behavior. S-O-R model-based studies have also been conducted to measure the impact of website design on the user. Chang and Chen (2008) argue that there is a relationship between the quality and name of the website and the consumer's trust and perceived risk, and that this influences the customer's purchase intention. Wu et al. (2008) claim that the atmospheric elements of the website, such as color and music, affect the customer's satisfaction and action and cause approach or avoidance behaviors in the customer. According to Wu et al.'s (2008) study, websites designed with fast-paced music and warm colors increase customers' satisfaction and reveal their intention to approach. However, Kim et al. (2009) argue in their study that product presentation on the website affects customers both emotionally and cognitively, while music on the website has a negative effect on customers. Jeong et al. (2009) argue that product presentation on the website is related to customer satisfaction, which in turn affects behavioral intention. Kim and Lennon (2010) examined how much information is provided about the products on the website and argued that product information affects customer perception of risk and customer satisfaction. Moreover, they suggest that perceived risk and level of satisfaction affect purchase intention. Wang et al. (2011) claim that the aesthetics of the website have an impact on customers' emotional and cognitive processes and that this has an impact on purchasing and revisiting the website.

As a result, website design in retail has been extensively studied for its impact on customer behavior. Researchers have focused on elements such as website quality, product presentation, atmospheric factors, and aesthetics. Studies have shown that website quality and reputation influence consumer trust and perceived risk, subsequently

affecting purchase intentions. However, the impact of product presentation and the presence of music on websites can vary, influencing customers emotionally and cognitively. Overall, website design plays a crucial role in shaping customer responses and behaviors, offering opportunities for retailers to optimize their platforms and enhance the customer experience.

2.3.3. Augmented Reality based on S-O-R Model

Since the S-O-R model was used in the study, studies on augmented reality using the S-O-R model were examined under a separate heading. However, AR studies using the S-O-R model are limited, and these studies were conducted on cosmetic products." This section is especially critical for understanding how the S-O-R model is used in academic studies on augmented reality applications.

Watson et al. (2018) use cosmetic products as their research focus, and their labor experiment involves 162 female students. In the study, the purchase intention of the participants and the factors affecting the purchase intention were investigated through virtual try-ons using the S-O-R Model. The relationship between augmentation and positive affective response, as revealed in the study conducted by Javornik (2016b), was examined. Hedonic motivation plays a moderating role in this relationship. The study supports Javornik (2016b) and also finds that a high positive affective response leads to a high purchase intention.

Wang et al. (2021) proposed a new model for the S-O-R Model in their study on the use of AR in the beauty product industry. In the study, augmentation, aesthetics, vividness, and interactivity constitute the Stimulus part of the model as AR characteristics. Stimulus constructs affect spatial presence. Then, spatial presence affects flow experience and decision comfort. The mentioned constructs affect purchase intention. Fashion innovation and individualism have a moderator effect. The sample consists of 238 female participants.

Studies on augmented reality with the S-O-R model are limited. Studies measure the effect of AR on purchase intention and suggest that AR has a positive effect on purchase intention.

3. THEORETICAL FRAMEWORK

The S-O-R model has been frequently used to investigate the effect of the in-store atmosphere in retailing and website stimuli on customer behavior in e-commerce. The S-O-R model has been utilized in various studies to investigate the impact of stimuli on customer behavior and analyze customer purchasing behavior in the context of AR in retailing. However, studies based on the S-O-R model in the AR context are limited. The proposed research model of Wang et al.'s study conducted in South Korea, which involves the presentation of cosmetic products to the customer with the help of AR in e-commerce based on the S-O-R model, is used as the research model of this study. However, this study employs a simplified version of the S-O-R model proposed by Wang et al. (2021). Figure 3.1 shows the proposed research model.

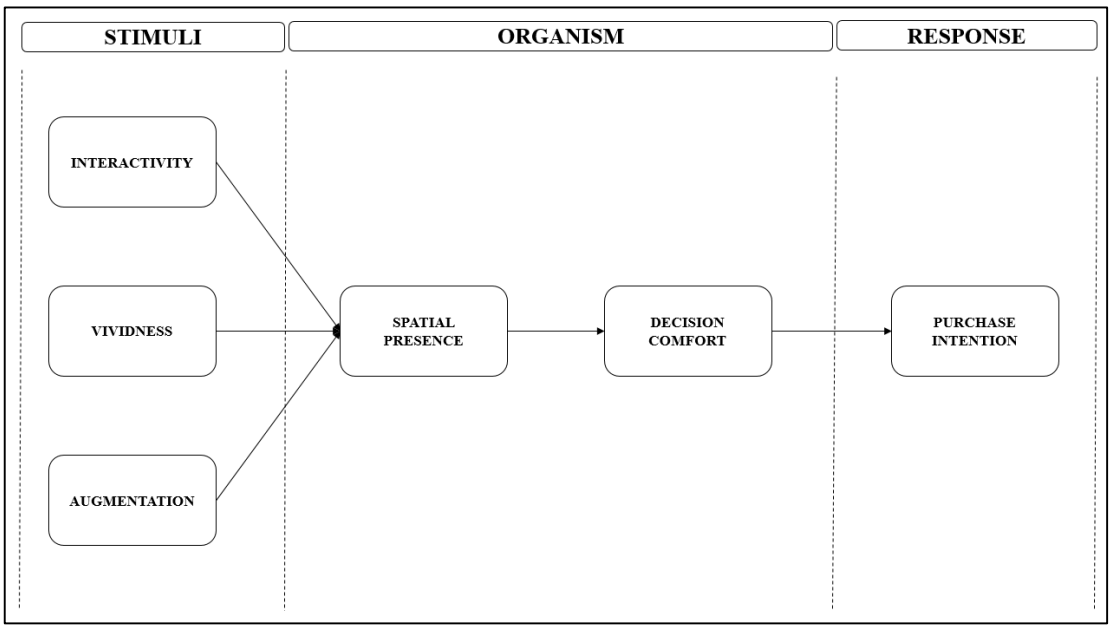

FIGURE 3.1: Proposed Research Model

The first section of the theoretical framework part describes stimuli, which include interactivity, vividness, and augmentation. The second section describes the organism, which includes spatial presence and decision comfort. The third section explains the response as a purchase intention. According to the S-O-R model, the proposed study focuses on the stimulus component, which includes interactivity, vividness, and augmentation. The Organism component includes the examination of spatial presence and decision comfort. The final stage of the research model is the Response component, which investigates purchase intention. The study did not use moderator variables.

3.1. STIMULUS

"S" in the S-O-R model of Mebriban and Russell (1974) represents the factors that affect the organism, known as stimuli. Stimulus are independent variables and environmental factors that bring about changes in customers' behavior and mental states (Bagozzi, 1986). Stimulus can vary depending on the focus of the study. While there are many stimuli such as scent, color, and music that can influence customer behavior when studying the impact of store atmosphere, the stimuli that affect customers shopping on a website can vary completely depending on the focus of the study. In this study, the proposed model by Wang et al. (2021) identified interactivity, vividness, and augmentation as the characteristic features of AR. They were examined as stimuli in the S-O-R model, which is the research model of the thesis. In the study, the features of AR emphasized as interactivity (Yim et al., 2017; McLean and Wilson, 2019), vividness (Yim et al., 2017), and augmentation (Javornik, 2016b) were used as stimulus.

3.1.1. Interactivity

Interactivity refers to the ability of users to quickly connect and communicate using a mobile device, as well as manage content simultaneously (Yim et al. 2017). This study is based on Yim et al.'s definition of interactivity. Sundar et al. (2015) argue that

interactivity has powerful psychological effects on customers' decision-making. Mejía-Gutiérrez et al. (2008) suggest that interactivity is one of the key factors for augmented reality because it is the most efficient way to connect the user with the new environment created.

Many studies have examined the interactivity that makes e-commerce attractive to customers and the effects of interactivity on customer behavior (Coyle & Thorson, 2001; Fiore et al., 2005; Joines et al., 2003). Historically, the first definition of interactivity in the AR context belongs to Steuer. Steuer (1992) defines interactivity as the extent to which the user can control the environment to which they are connected through a technological intermediary. Subsequently, Pavlik (1996) states that interactivity stands out as a critical factor for the internet. Heeter (2000) highlights that people are in constant interaction with each other and with objects. Because of that, interactivity is an essential part of human life, and it shows up in people's reactions (avoidance or acceptance) to new technologies (Arghasgi & Yüksel, 2022). Interactivity: perceptions created by individuals who are constantly in a state of change through the interaction of media and psychological factors are associated with communication channels, technological features, and media characteristics (Kiousus, 2002).

Pantano and Servidio (2012) suggest that interaction will emerge if customers are willing to use AR technology. AR technology can add non-material information or objects in a three-dimensional and virtual way to the user's real environment, even though they do not exist in the real world, which allows customers to interact with virtual objects in the real world through AR (Poushneh, 2018). This provides customers with the ability to control virtual objects and engage in a virtual object-centered interaction in the real world (McLean & Wilson, 2019). Interactivity has been examined by many different academics in the context of AR, and it has been argued that AR offers a high level of interaction (Kim et al., 2017; Yim et al., 2017b; Hoffman & Novak, 2009; Nikhashemi et al., 2021).

3.1.2. Vividness

Vividness, as defined by Steuer (1992, p.80), refers to "the ability of a technology to produce a sensorially rich mediated environment". This study is based on Steuer's definition of vividness. It is often understood as realism or richness in some studies (Sadowski & Stanney 2002; Witmer & Singer 1998), and is associated with the senses people perceive in real products compared to the non-sensory background of virtual objects (Lee, 2004).

In the context of e-commerce, vividness has been frequently understood as the excellence of product displays (Jiang & Benbasat, 2007), and it has been argued by Nisbet and Ross (1980) that more vivid products influence customer decision-making more. Customers are more impressed and informed in the virtual environment by vivid products compared to faded products, which enables them to evaluate products more accurately (Jiang & Benbasat, 2007). The degree of vividness is determined by the number of senses interacting at the same time, with greater vividness resulting from greater sensory interaction (Witmer & Singer, 1998).

According to Wang et al. (2021), if virtual product images presented to customers through augmented reality are as realistic as real product images, customers are more likely to use AR. The vividness of the visual content experienced during the purchase affects the quality of the information the customer receives (Flavián et al., 2017). Additionally, the degree of vividness of products not only influences the customer's cognitive decision-making processes but also enables the customer to recall the product. The quality of vividness can thus affect the customer positively or negatively (Flavián et al., 2016).

Furthermore, Shin (2017) notes that vividness increases customer engagement in interactive environments and prolongs the duration of the experience. Vividness helps customers visualize products in their minds, as does interactivity (Phillips et al., 1995). By encouraging people to engage their senses, vividness makes information more accessible to them (Li et al., 2002).

3.1.3. Augmentation

Augmentation defines the extent to which an augmented product is perceived as real by the user. Javornik (2016b). According to Javornik (2016b), although the main feature of augmented reality applications is interactivity, it is critical that the product look very close to the real thing. Moreover, the quality of the augmentation of augmented objects contributes to an immersive experience for the user. Javornik (2016b) introduced augmentation by arguing that the virtual object should be perceived as real in the real environment. Javornik (2016b) defines interactivity as a common feature of all immersive technologies while arguing that augmentation is a unique variable of AR and its use in the marketing field is necessary. This study is based on Javornik's (2016b) definition of augmentation.

Poushneh (2018) used a more broadly defined augmentation construct than Javornik (2016b). Poushneh (2018) uses the augmentation variable to focus on the user's one-to-one relationship with the virtual object, excluding real objects from the experience.

Billinghurts and Kato (2002) state that AR augments the real environment with a virtual object, and the user experiences a new augmented environment. Javornik (2016b) argues that augmentation should be defined as variable because AR adapts to constantly changing stimuli from the real environment. The better the augmentation, the more seamless the experience for customers (Hilken et al., 2017). If the quality of the augmentation is low, the customer's perception of reality is distorted, and the customer has a negative experience (Rauschnabel et al., 2019). When the quality of the augmentation is high, the users feel that they are in a natural environment rather than an AR environment (Hilken et al. 2017).

3.2. ORGANISM

Emotions are reactions that occur depending on the situations, objects and stimulus and are mostly uncontrollable by the individual (Schmitt, 1999). The organism part of the SOR model developed by Mehrabian and Russell (1974) is used to reveal the emotions experienced in the consumer's inner world. Furthermore, organism is also the mediating variable that explains the relationship between the dependent variable (Response) and the independent variables (Stimulus). The organism part of the study will examine spatial presence and decision comfort.

3.2.1. Spatial Presence

According to Schubert (2009), spatial presence is a framework that is subjectively perceived and allows virtual things or environments to be viewed as actual, physical items or environments. This study is based on Schubert's definition of spatial presence. Lee (2004) suggests that spatial presence is a construct that explains to what extent virtual objects are perceived as real by users and how this perception is transformed into a fluid experience.

Hilken et al. (2017) have provided a detailed definition of spatial presence. Spatial presence is defined as the complete focus on a virtual object in a space and the control of the object by the user (Hilken et al., 2017). Spatial presence actually refers to the individual's mere existence in space, with the main focus shifting towards the virtual object that is not actually present in the real environment. To clarify the definition, spatial presence is when the user focuses only on the virtual object in the real environment. This study is based on Hilken et al.'s definition of spatial presence.

When analyzed historically, it appears that there are different concepts of presence. Lee (2004) attributed the fact that presence has been called by different names, such as telepresence, presence, or spatial presence, in previous studies to the fact that researchers could not reach a common definitional decision. In order to explain why the

concept of spatial presence is used in this study, the concepts of presence, telepresence, and spatial presence should be explained separately.

Presence refers to a user's sense of being present in a virtual or media environment. Steuer (1992) explains presence as the natural perception of being in a virtual environment. The user experiences presence when immersed in the virtual environment. Presence is defined as a subjective experience where the experience is perceived as real and its virtuality is not recognized by the user (Slater & Wilbur, 1997; Lee, 2004). On the other hand, Riva and Waterworth (2003) consider presence a neuropsychological phenomenon and define it as the feeling of being in a new environment independent of the physical environment. For example, when a gamer is playing a computer game, he or she is completely immersed in the virtual world of the game.

Telepresence is the concept of presence where a person feels as if they are present in a remote environment (Steuer, 1992). For example, a person videoconferencing for a business meeting feels that he or she is in the environment of the person he or she is meeting with. The first description of telepresence was made by Minsky (1980). In his study, he defined telepresence as the user's feeling of being present in environments created through technology. Steuer (1992) defines it as "being there". Steuer (1992) explains telepresence as the perception that users feel in a new environment through technology; in later studies, telepresence has been associated with the perception that users are distanced from their physical environment (Sheridan, 1992; Schoerb, 1995). Kim and Biocca (1997) define telepresence as the subjective feeling of being present in a virtual environment but distanced from the physical environment.

Spatial presence is a special concept of presence used for augmented reality. Customers perceive virtual objects as if they exist in the real world through AR (Smink et al., 2020). It describes the experience in which a person feels as if the virtual object is present in their real environment (Schubert, 2009). The concept of spatial is used in environments where reality and virtuality are combined (Schubert, 2009). For example, it is the feeling that someone who wants to buy a chair perceives when looking at what a virtual chair looks like in a workroom through AR.

An AR-enabled application provides users with the ability to interact with virtual objects by changing, moving, shrinking, enlarging, adding, or removing them (Scholz &Smith, 2015). Virtual objects adapt to the users' real environment in AR-mediated environments and are perceived as real by the users (Smink et al., 2020; Scholz & Smith, 2015; Lee, 2004). In order for users' sense of spatial presence to be strengthened, the number of senses used during the experience needs to be increased, and the user needs to have more control over the new space of presence to which they feel they belong (Hilken et al. 2017). Increasing the reality level of the spatial presence experience by the user increases the coherence between the virtual object and the real world, allowing the user to have a more real experience (Suh & Chang, 2006). Moreover, Ahn et al. (2016) argue that this realistic spatial presence that is experienced leads users to be more responsive to the AR-mediated environment. For this reason, the concept of spatial presence is used in this study.

3.2.2. Decision Comfort

Parker et al. (2016) define decision comfort as a physical and psychological comfort supported by soft positive emotions that arise during the decision-making process and a state of well-being for the individual. Parker et al. (2016) have placed decision comfort on an emotion-based scale. The negative emotions experienced by an individual have been examined in two phases, with hard negative emotions consisting of feelings such as distress or tension and soft negative emotions consisting of feelings such as resignation or sadness. Similarly, positive emotions have been examined in two phases on the other side of the scale, with hard positive emotions being defined as excitement and enjoyment, while decision comfort is defined as a soft positive emotion.

Kahnemann et al. (1990) define the endowment effect as the tendency for people to place greater value on products and services that they own. Hilken et al. (2017) argue that the sense of ownership that can be fulfilled through augmented reality can strengthen customers' hedonic values. Dacko (2017) suggests that AR technology not only provides customers with convenience during shopping but also helps them combat indecisiveness. Song et al. (2019) claim in their study on the relaxing effect of AR on customers' decision-

making processes that the endowment effect can be achieved through AR and can be effective in customers' decision-making. For this reason, decision comfort was used in the research. Since decision comfort is derived from affective responses, it differs from decision confidence, which is based on cognitive processes (Broniarczyk & Griffin, 2014; Parker et al., 2016). Parker et al.'s (2016) definition of decision comfort emphasizes the importance of soft emotional processes instead of cognitive processes.

3.3. PURCHASE INTENTION AS A RESPONSE

Purchase intention, as defined by Peter and Olson (2010), is a consumer's plan to buy a specific product. In the study, purchase intention is evaluated through this definition. Kim and Ko (2010) define purchase intention as the probability of customers purchasing a product. Yadav et al. (2013) suggest that purchase intention is a behavioral outcome.

Beck and Crie (2018) argue that AR applications have a significant influence on consumers' purchase intentions by allowing them to visualize and virtually experience the product. In addition, Hilken et al. (2017) suggest that the utilization of augmented reality applications that foster high levels of interaction positively affects customers' perception of value and, as a result, influences their behavioral intentions. In this thesis, purchase intention is considered the response part of the S-O-R model.

4. RESEARCH METHODOLOGY

Academic studies are investigations that employ scientific techniques and are carried out in a methodical manner. These studies' research approach is their lynchpin. Planning the research approach entails deciding how it will be carried out, what procedures it will utilize, and what methods it will employ. This planning makes sure that the study is supported by reliable, valid, and scientifically valuable premises.

The research methodology of the study is analyzed under eight headings. In the first section, the purpose of the research is explained. In the second section, the conceptual model is explained, hypotheses are proposed, and the relationships between the constructs are supported by previous studies. The third section describes the research method, and the fourth section describes the research and experimental design. In the fifth section, measurement development is explained, the scales used to measure the constructs are mentioned, and the researchers who developed these scales are mentioned. In the sixth section, information about the sample is given. The seventh section explains how the data was collected. In the eighth section, the methodology used to analyze the data is explained in detail.

4.1. RESEARCH PURPOSE

This thesis aims to examine the impact and implications of employing web-based augmented reality in furniture retailing on consumer behavior. To accomplish this, a comprehensive framework will be developed based on the S-O-R (Stimulus-Organism-Response) paradigm, which will facilitate the examination of stimuli and subsequent consumer behavioral responses within the context of web-AR. The S-O-R model has been used frequently in the past, such as for the effect of the in-store atmosphere and website

design on customers (Bakırtaş, 2013). It has been used by some researchers to examine the effect of AR technology on customer behavior. (Wang et al., 2021). The thesis aims to contribute to the literature on the compatibility of the S-O-R model while examining customer behavior in web-AR.

Given the growing importance of AR in e-commerce and the rise of online marketplaces, the purpose of this research is to investigate the potential of web-AR as an innovative method to improve the consumer experience in online retailing. The study aims to contribute to the current body of information on AR technology adoption and its effects on customer behavior in online retail environments by analyzing the application and efficiency of web-AR. The findings of this research can provide valuable insights for businesses seeking to leverage AR technologies, particularly through web-AR, to create engaging and memorable customer experiences in the ever-evolving digital retail landscape.

4.2. CONCEPTUAL MODEL AND HYPOTHESES

The theoretical framework of the research was developed based on the Stimulus-Organism-Response (S-O-R) model proposed by Mehriban and Russell (1974). The research model proposed by Wang et al. (2021) in their study was presented as the research model of this study. The study uses a simplified version of the research model proposed by Wang et al. (2021). Wang et al. (2021) examined whether customers' trials of beauty products with AR and the characteristic features of AR resulted in purchase intention based on the S-O-R theory. Since beauty products are tried personally and are personal products, individualism was excluded from the research model. Similarly, fashion innovation was excluded from the research model because the study was conducted with furniture. Since the research could not be conducted in a specific, pre-designed research room, the aesthetic construct was removed from the stimuli.

The study identified interactivity, vividness, and augmentation as characteristic features of AR. The Organism section of the model investigates the effect of the stimuli on spatial presence. Spatial Presence affects decision comfort. In the final stage, the

relationship between decision comfort and purchase intention is examined. Figure 4.1 shows the proposed research model.

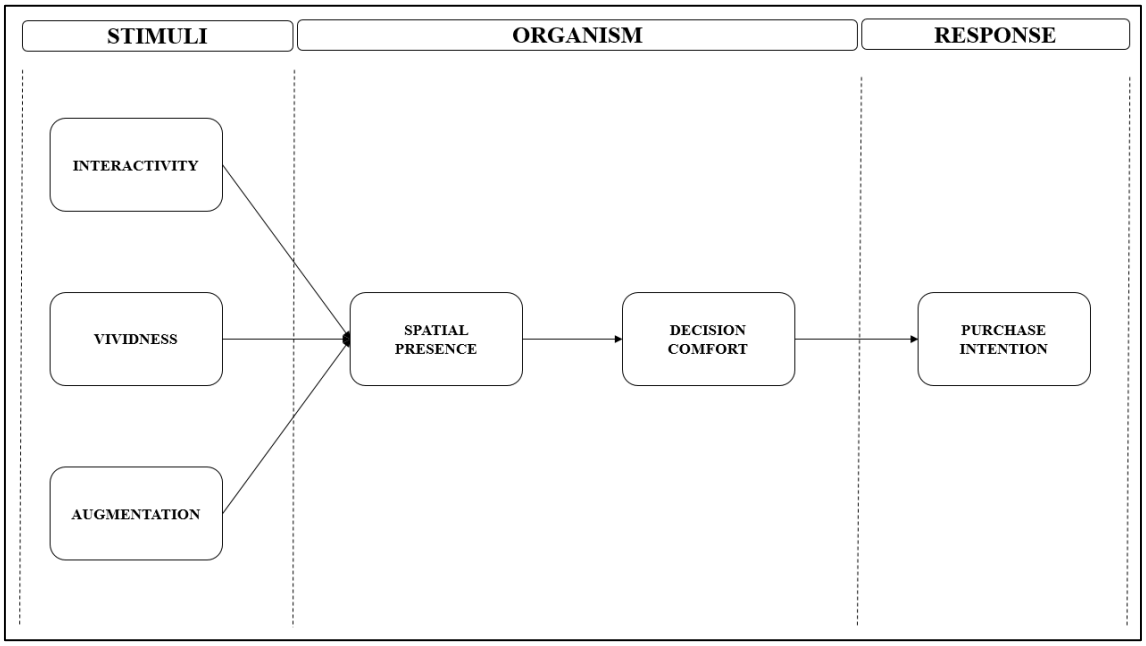

FIGURE 4.1: Proposed Research Model

4.3. HYPOTHESES DEVELOPMENT

→ The Relationship between Interactivity and Spatial Presence

Regenbrecht and Schubert (2002) suggest that interactivity has a positive effect on spatial presence. Walther et al. (2005), in their study on online health information systems, argue that interactivity plays a role and positively affects the perception of presence in online environments. Wang et al. (2021) argue that interactivity, a characteristic feature of AR, has a positive effect on spatial presence. Ruyter et al. (2020) suggest that interactivity leads to a sense of spatial presence in digital content users and that there is a positive relationship between them. Kumar and Srivastava (2022), in their study on the extended theory of spatial presence, argue that interactivity has a positive effect on spatial presence among AR features.

Therefore, the following hypothesis were developed in the study.

H_{1a}: *Interactivity provided by Web-AR has a positive influence on a user's feeling of the online furniture store's spatial presence.*

→ The Relationship between Vividness and Spatial Presence

Wang et al. (2021) claim that vividness has a positive effect on spatial presence in their study on the use of AR in an online beauty products store. D'Angiulli et al. (2013) suggest in their study that vividness has a positive effect on a stronger sense of spatial presence. Wu and Lai (2021) claim that high levels of vividness increase the sense of presence. Ruyter et al. (2020) suggest that vividness leads to a sense of spatial presence in digital content users and that there is a positive relationship between them.

Therefore, the following hypothesis were developed in the study.

H_{1b}: *Vividness provided by Web-AR has a positive influence on a user's feeling of the online furniture store's spatial presence.*

→ The Relationship between Augmentation and Spatial Presence

Wang et al. (2021) suggest that augmentation, a characteristic feature of AR, has a positive effect on spatial presence. Kumar and Srivastava (2022), in their study on the extended theory of spatial presence, argue that augmentation has a positive effect on spatial presence among AR features. Hilken et al. (2017) suggest that using spatial presence as a success metric for AR-based service augmentation requires replacing a person's "own location" with a sense of "object location" in physical reality. This reveals the positive effect of augmentation on spatial presence.

Therefore, the following hypothesis were developed in the study.

H_{1c}: *Augmentation provided by Web-AR has a positive influence on a user's feeling of the online furniture store's spatial presence.*

→ The Relationship between Spatial Presence and Decision Comfort

Hilken et al. (2017) argue that there is a positive relationship between decision comfort and spatial presence in the AR context. However, in order for this relationship to be stronger, customers need to be fully aware of privacy issues. Sengupta and Cao (2022) argue that there is a positive relationship between spatial presence and decision comfort, but this relationship will decrease if customers' privacy concerns increase. Wang et al. (2021) also reveal the positive relationship between spatial presence and decision comfort in their study.

Therefore, the following hypothesis were developed in the study.

H_2: *Spatial presence has a positive influence on decision comfort.*

→ The Relationship between Decision Comfort and Purchase Intention

Wang et al. (2021) revealed a positive relationship between decision comfort and purchase intention in their study on how mobile augmented reality applications affect customer behavior. Liu et al. (2022) suggest that customers' feeling comfortable has a positive effect on purchase intention.

Therefore, the following hypothesis were developed in the study.

H_3: *Decision comfort has a positive influence on customers' purchase intention in the online furniture store.*

4.4. RESEARCH DESIGN

In order to test the research model, data was collected from 146 participants via a questionnaire in June 2023. The participants were selected by the researcher from online shoppers. At the first stage of the study, participants were asked to scan the QR code of virtual furniture developed with web-AR. Participants were asked to use the web-AR for 5 minutes. In the second phase of the study, participants were asked to complete an online questionnaire. Participation in the questionnaire was voluntary. In addition, participants were asked for their explicit consent at the beginning of the questionnaire. An example of furniture developed with web-AR technology by Basebros company used in the study is shown in Figure 4.2.

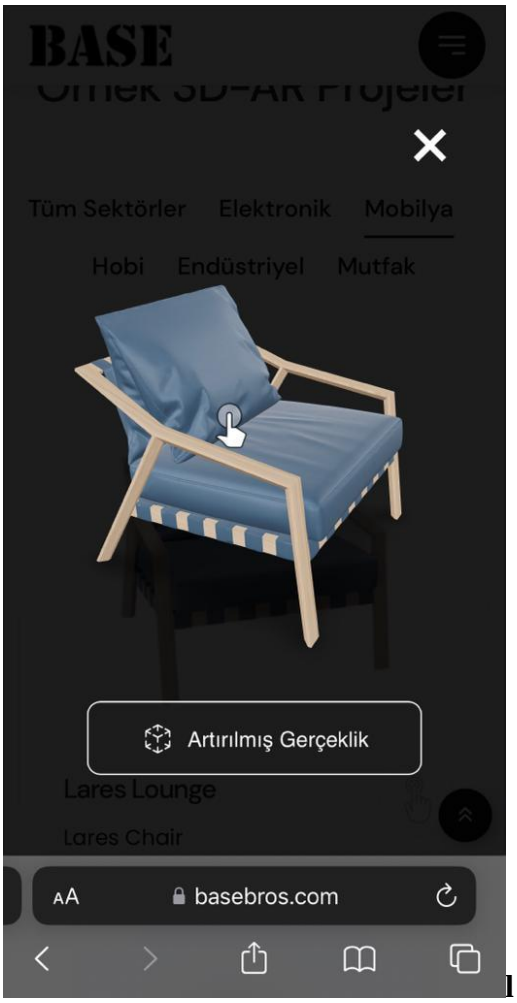

FIGURE 4.2: Web-AR Interface
Source: https://www.basebros.com/3d-artirilmis-gerceklik.html

The participants' experience of using web-AR technology during the research is shown in Figure 4.3.

FIGURE 4.3 : Web-AR from a User Perspective
Source: Author's own work, Istanbul, June.

After scanning the QR code, participants see the screen in Figure 4.3. The expression "Artırılmış Gerçeklik" written in Turkish under the furniture in Figure 4.2, means augmented reality. After clicking on this phrase, the user scans the room with the phone camera. Immediately afterwards, the virtual furniture appears in the real environment, as shown in Figure 4.3. The user can rotate the furniture 360 degrees and also zoom it. Figure 4.3 shows the web-AR experience of a participant in the study as seen on the phone screen.

4.5. THE MEASUREMENT DEVOLOPMENT

When designing the questionnaire, questions were rearranged according to web-based augmented reality technology, and furniture expressions were added to the places where objects were defined as X. For example, "the way AR technology displays X is attractive" was rearranged as "the way web-ar technology displays furniture is attractive." The questionnaire consists of 28 questions based on the S-O-R model, with 13 questions related to stimuli, 12 questions related to the organism, and 3 questions related to the response. Vividness, augmentation, and decision comfort have reverse questions, indicated by an asterisk. A 7-point Likert scale was used in the study (1 = strongly disagree, 4 = neutral, 7 = strongly agree) (Symonds, 1924).

TABLE 4.1: Questionnaire design

Construct (Factor)	Item Codes	Number of Questions	Adopted from
Interactivity	INT	3	Wu (2005)
Vividness	VIV	5	Babin and Burns (1998)
Augmentation	AUG	5	Javornik (2016b)
Spatial Presence	SPT	7	Vorderer (2004)
Decision Comfort	DCM	5	Parker et al. (2016)
Purchase Intention	PIN	3	Moriuchi, E. (2018); Spears and Singh (2004)

Personal questions were asked in the continuation of the questionnaire. These questions include demographic questions such as gender, age, education level, etc., while also asking questions that support the study but have a different focus from the main research topic, such as whether the participant has previously purchased a product or service using AR, whether they have used AR before, and to what extent their AR experience would be helpful in shopping, etc. The construct names, item codes to be used for statistical analysis of construct names, the number of questions, and the researchers who developed the scales for each construct are shown in Table 4.1.

4.6. SAMPLE SELECTION

A questionnaire was created for the purpose of the study to investigate the impact of web-based augmented reality applications on users' purchase intentions. The questionnaire form will be chosen from people who live in Istanbul and purchase it online. At the same time, participants were over 18 years of age and of all genders.

A non-probability sampling method was used to select the sample. Nakip (2013) and Denscombe (2010) suggest that the non-probability sampling method should be used in cases where it is difficult to reach the main population. There are different methods under the non-probability sampling method. In this study, a purposive (judgmental) sampling method was used. According to Nakip (2017), in judgmental sampling, it is emphasized that who will be selected for the sample can be left to an expert or the researcher himself. This is the difference between convenience sampling and judgmental sampling. The researcher targeted online shoppers when selecting the sample. In the same way, people from different age groups and professions were included in the sample.

Gorsuch (1983) suggests that the number of participants should be five per item. In the study, 28 questions were asked. There should be at least 140 participants in the study. The total number of participants was 146.

4.7. DATA COLLECTION

Within the scope of the research, data was collected with a questionnaire to measure the influence of web-AR technology on customer purchase intentions. Denscombe (2010) suggests that a questionnaire can be used to access the primary data source and test hypotheses. The questionnaire was organized through Google Forms, which is free of charge. Denscombe (2010) states that collecting data online does not lead to any change in data quality. Then, the Google Form link to the survey was organized as a QR code so that the participants could easily access the questionnaire.

Data collection lasted throughout June 2023. The questionnaire was administered face-to-face to the participants by the researcher. It takes an average of 5 minutes for a participant to use the web-AR technology. Participants took an average of 7 minutes to complete the questionnaire.

4.8. DATA ANALYSIS METHOD

Structural Equation Modeling (SEM) is a multivariate statistical analysis technique for estimating dependent relationships between measured variables and latent constructs (Malhotra, 2010). SEM is used to measure and assess the relationships between variables in a conceptual model (Hair et al., 2011). Savalei and Bentler (2006) argue that the use of SEM in psychology and marketing is increasing. Furthermore, Savalei and Bentler (2006) argue that SEM is suitable for theory testing in research where experimentation is not possible. When compared to other multivariate statistical approaches, SEM provides flexibility, allowing researchers to model connections, construct unobservable latent variables, and test theoretical assumptions against empirical data (Chin, 1998).

SEM consists of a measurement model and a structural model. The measurement model involves factor analysis as well as internal reliability, whereas the structural model includes multiple regression (Anderson & Gerbing, 1988). There are two different SEM approaches. Covariance-based structural modeling (CB-SEM) and partial least squares structural equation modeling (PLS-SEM) are two alternative techniques to SEM.

In contrast to CB-SEM, which is theory-based, PLS-SEM is predictor-oriented and variance-based in how it handles data analysis. (Hubona, 2010) While CB-SEM requires parametric data, PLS-SEM employs non-parametric data. Additionally, compared to CB-SEM, which needs a minimum of 200 respondents, PLS-SEM permits smaller sample sizes. For complicated models, PLS-SEM can be modeled either formatively or reflectively to ensure optimum prediction accuracy. However, only reflective modeling of CB-SEM is possible, ensuring optimal parameter accuracy.

There are two reasons for using the PLS-SEM approach in this study. The first reason is that PLS-SEM, unlike CB-SEM, is prediction-oriented. The second reason is that the total number of participants in the study was less than 200. For all these reasons, PLS-SEM was used as the data analysis method in this study. Descriptive statistics and tests of multiple groups were performed with SPSS 26.0. The PLS-SEM method was applied using Smart PLS 4.0.

5. RESEARCH FINDINGS

The details of the research methodology were explained in the previous chapter. In this chapter, the results obtained by the selected PLS-SEM data analysis method are analyzed according to the research model.

During the analysis of the research findings, the first chapter examines the demographic characteristics of the sample, their knowledge about AR, and data regarding their previous use of AR under the descriptive statistics chapter. The second chapter focuses on the measurement model and conducting reliability and validity tests on the sample. The third chapter examines the goodness-of-fit of the model. The fourth chapter analyzes the structural model and interprets the results of hypothesis testing. The fifth chapter tests group differences on various factors such as occupation, age groups, education levels, and gender.

In this study, both descriptive and inferential statistics were performed. SPSS 26.0 and Smart PLS 4.0 were utilized for data analysis.

5.1. DESCRIPTIVE STATISTICS

Bordens and Abbot (2002) suggest that descriptive statistics should be explained to identify the characteristics of the target audience and show how the target audience reflects the sample. Although the sample consisted of 146 people, it was selected from different age and occupational groups of the society. Table 5.1 below shows the demographic characteristics of the sample.

TABLE 5.1: Sample demographics

Characteristics	Category	Number (N = 146)	Percentage (%)
Gender	Female	72	49.3
	Male	74	50.7
Age	18 - 25	37	25.4
	26 - 30	57	39.1
	31 - 35	15	10.3
	36 - 40	10	6.8
	41 - 45	10	6.8
	45+	17	11.6
Education	High School graduated	11	7.5
	Undergraduate student	29	19.9
	Undergraduate graduated	59	40.4
	Master's student	27	18.5
	Master's graduate	13	8.9
	PhD student	7	4.8
Occupation	Student	32	21.8
	Private Sector Employee	88	60.3
	Public Officer	19	13.0
	Homemaker	2	1.4
	Self-employment	4	2.8
	Retired	1	0.7

Table 5.1 is analyzed in detail below. The sample for this study consists of a group of 146 participants. Participants were selected from all segments of society and from different age groups. The fact that 49.3% of the participants were women and 50.7% were men shows that the sample was balanced in terms of the ratio of men and women.

When the age distribution of the sample is analyzed, it is seen that the 26–30 age group constitutes the age range with the highest number of participants in the sample,

with 39.1%. The presence of 25.4% of the 18–25 age group and 10.3% of the 31–35 age group in the sample indicates that the sample mainly represents the young and middle age groups. In the rest of the sample, the 36–40 age range is 6.8%, the 41–45 age range is 6.8%, and the 46 and over age range is 11.6%.

When the educational level is analyzed, it is seen that most of the participants in the sample are undergraduate graduates (40.4%). The remaining participants consisted of 19.9% undergraduate students, 18.5% master's students, 8.9% master's graduates, 7.5% high school graduates, and 4.8% PhD students. 72.6% of the sample has at least a bachelor's degree.

When the occupational distribution of the sample is analyzed, it is seen that private sector employees constitute more than half of the sample, with a rate of 60.3%. The rest of the sample consists of students (21.8%) and public officers (13.0%). Apart from this, self-employment (2.8%), homemaker (1.4%), and retired (0.7%) are represented at very low rates in the sample.

Table 5.2 below presents the answers to the question about whether the participants had used augmented reality before participating in the study.

TABLE 5.2: The Experience of Using Augmented Reality

Have you ever used augmented reality before taking this questionnaire?		
Category	Number (N = 146)	Percentage (%)
Yes	79	54.1
No	58	39.7
I don't remember	9	6.2

Table 5.2 shows that 54.1% of the participants had previously used AR. This corresponds to more than half of the sample. 39.7% of the participants had never experienced AR before participating in the study. 6.2% of the participants did not remember whether they had used AR before.

The table 5.3 below shows the responses to the question on whether respondents have ever purchased products or services using AR.

TABLE 5.3: The Experience of Buying a Product or Service Using Augmented Reality

Have you ever purchased a product or service using augmented reality?		
Category	Number (N = 146)	Percentage (%)
Yes	31	21.2
No	108	74.0
I don't remember	7	4.8

Table 5.3 shows that 74.0% of the respondents have not purchased products or services using AR before. This corresponds to almost three-quarters of the sample. While 21.2% of the participants stated that they had purchased products or services using AR before, 4.8% stated that they did not remember whether they had purchased products or services using AR.

Within the scope of the research, participants were asked to evaluate the usefulness of the use of web-AR in e-commerce on a 7-point Likert scale. According to the evaluation results, participants gave a score above six. They strongly agreed that the use of AR in e-commerce is beneficial.

5.2. THE MEASUREMENT MODEL

In the measurement model, the factor loadings of VIV3 from the Vividness scales and SPT5 from the Spatial Presence scales were excluded because they were below 0.5.

Anderson and Gerbing (1988) define structural equation modeling as two different conceptual analyses. Of these two analyses, defined as the measurement model and structural model (Savalei & Bentler, 2006), the measurement model should be analyzed first (Wong, 2013). Anderson and Gerbing (1988) suggest that measurement model analysis is used to determine the reliability and validity of the model. This section examines the first part of the PLS-SEM approach, the measurement model.

According to the values given in Table 5.4, the measurement model should be examined. First of all, the reliability tests of the research results should be examined. According to Fornell and Larcker (1981), the standardized factor loading of observed variables that belong to latent variables must be statistically significant and greater than 0.50. The factor loadings of the observed variables included in the study are higher than 0.5. Then, reliability and consistency tests of the measurement model should be performed. According to Hair et al. (1998), each construct must have Composite Reliability (CR) and Cronbach's Alpha (CA) values of more than 0.70 for reliability and consistency tests. The composite reliability and Cronbach's Alpha values of all latent variables in the study are above 0.7. These values indicate that the measurement model passes the reliability test.

After the reliability test, the validity of the measurement model should be examined. Wong (2013) states that convergent and discriminant validity tests should be considered for validity analysis. Average Variance Extracted values should be considered for convergent validity. Each latent variable's Average Variance Extracted (AVE) value must be greater than 0.50 for convergent validity (Fornell & Larcker, 1981). AVE values of all constructs are above 0.5. The measurement model ensures convergent validity.

TABLE 5.4: Measurement Constructs

Construct (Factor)	Coding	Item (Indicator)	Factor Loadings	Cronbach's alpha	CR (rho_a)	CR (rho_c)	AVE
Interactivity	INT	INT1	0.720	0.722	0.788	0.833	0.625
		INT2	0.810				
		INT3	0.838				
Vividness	VIV	VIV1	0.790	0.751	0.762	0.843	0.574
		VIV2	0.780				
		VIV4	0.657				
		VIV5	0.794				
Augmentation	AUG	AUG1	0.797	0.762	0.785	0.838	0.514
		AUG2	0.564				
		AUG3	0.650				
		AUG4	0.697				
		AUG5	0.841				
Spatial Presence	SPT	SPT1	0.867	0.874	0.915	0.907	0.627
		SPT2	0.895				
		SPT3	0.914				
		SPT4	0.844				
		SPT6	0.601				
		SPT7	0.551				
Decision Comfort	DCM	DCM1	0.894	0.877	0.910	0.914	0.686
		DCM2	0.892				
		DCM3	0.526				
		DCM4	0.874				
		DCM5	0.893				
Purchase Intention	PIN	PIN1	0.944	0.891	0.903	0.933	0.823
		PIN2	0.922				
		PIN3	0.853				

Heterotrait-Monotrait (HTMT) ratio of correlations should be examined for the discriminant validity of the study (Henseler et al., 2015). The Heterotrait - Monotrait Ratio Analysis of Correlations between Indicators of the measurement model is shown in Table 5.5 below. Kline et al. (2011) suggest that the cut-off values between constructs should not exceed 0.85. Except for the value between spatial presence and vitality, all values are below the cut-off value of 0.85 and are at acceptable levels. The value between vividness and spatial presence is 0.880. According to Henseler et al. (2015), since there may be similarities between constructs, it suggests that cases where the cut-off value of 0.90 is not exceeded can be accepted. Therefore, all values satisfy discriminant validity.

TABLE 5.5: Heterotrait - Monotrait Ratio Analysis of Correlations among Contructs

	AUG	**DCM**	**INT**	**PIN**	**SPT**	**VIV**
AUG						
DCM	0.678					
INT	0.814	0.607				
PIN	0.703	0.800	0.629			
SPT	0.779	0.808	0.746	0.771		
VIV	0.765	0.686	0.782	0.631	0.880	

The measurement model of the study meets the reliability and validity tests. In the next stage, the goodness of fit of the model and then the structural model is examined.

5.3. GOODNESS OF FIT OF THE RESEARCH MODEL

The goodness of fit of the model should be examined before proceeding to the hypothesis tests. According to Hair et al. (2019a), the necessity of looking at the goodness of fit of the model in PLS-SEM applications is discussed. However, the goodness of fit of the model was examined. Hu and Bentler (1999) set the SRMR value as a measure of model goodness for PLS-SEM and suggest that it should be less than 0.10 or 0.08. When the model fit is examined, it seems that the SRMR value is 0.089. The goodness of fit of the model is below 0.10.

In order to examine the goodness of fit of the model in more detail, VIF values should be checked. VIF values are expected to be below five (Hair et al., 2019a). As seen in Table 5.6, all VIF values in the structural model are below five.

TABLE 5.6: VIF Values of the Structural Model

	AUG	DCM	INT	PIN	SPT	VIV
AUG					1.918	
DCM				1.000		
INT					2.024	
PIN						
SPT			1.000			
VIV					1.806	

Hair et al. (2019b) also suggest that the R^2 value (determination coefficient) of the model should be considered for the model's goodness of fit. In this study, the coefficient of determination of the purchase intention construct is 0.506. The independent variables in the model explain the purchase intention of 50.6%. The model moderately explains the effects on purchase intention.

5.4. THE STRUCTURAL MODEL AND ANALYSIS TEST RESULTS

The measurement model was considered reliable and valid. Subsequently, information about model fit is given. In this section, the structural model is analyzed. Hypotheses were tested using bias-corrected bootstrapping method in Smart PLS 4.0 (Efron, 1987). Henseler (2017) suggested that 4999 subsamples should be selected in order for the test results to be close to infinity, so 4999 subsamples were selected in the analysis. Wong (2013) states that hypotheses should be tested using the t-significant and path coefficient values of the research model. In this study, all hypotheses were tested at 5% ($p = 0.05$) significance level. Wong (2013) states that path coefficient values are considered significant when they are greater than 0.2 or less than -0.2. The outcomes are as follows; H_{1a} ($\beta = 0.197$, $t = 2.251$, $p < 0.05$), H_{1b} ($\beta = 0.425$, $t = 3.576$, $p < 0.05$), H_{1C} ($\beta = 0.320$, $t = 3.829$, $p < 0.05$), H_2 ($\beta = 0.723$, $t = 10.263$, $p < 0.05$) and lastly H_3 ($\beta = 0.712$, $t = 10.498$, $p < 0.05$). Hypothesis test results are shown in Table 5.7 below.

TABLE 5.7: Hypothesis testing Results

Hypothesis No.	Path	Path Coefficient	T statistics	P values	Remark
H_{1a}	INT -> SPT	0.197	2.251	0.024	Accepted
H_{1b}	VIV -> SPT	0.425	3.576	0.000	Accepted
H_{1c}	AUG -> SPT	0.320	3.829	0.000	Accepted
H_2	SPT -> DCM	0.723	10.263	0.000	Accepted
H_3	DCM -> PIN	0.712	10.498	0.000	Accepted

All hypotheses proposed in the study were supported.

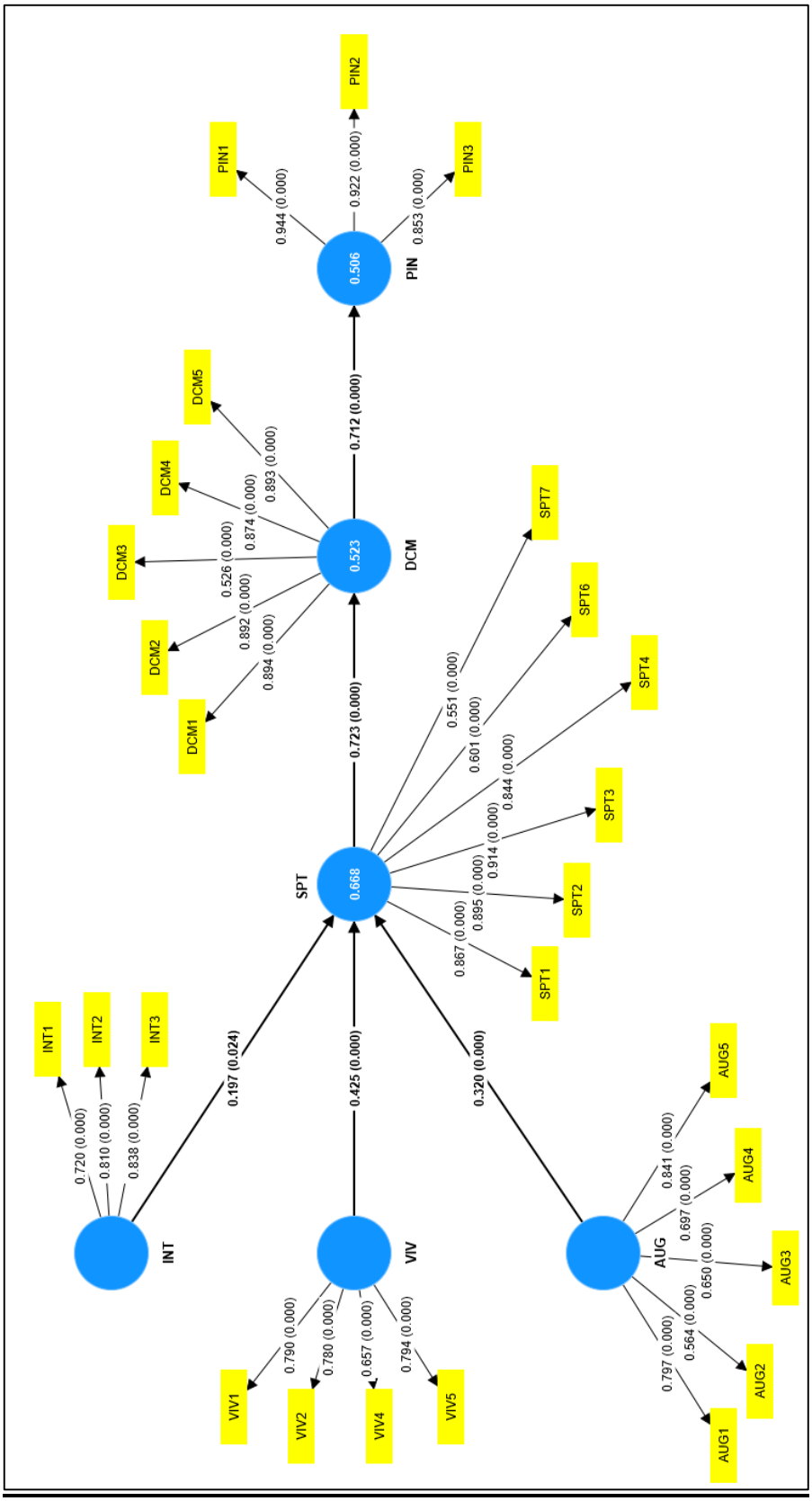

FIGURE 5.1: Revised Model from Smart PLS

Figure 5.1 is from Smart PLS and shows factor loadings in arrow directions. It also shows the R^2 values of spatial presence, decision comfort and purchase intention.

Table 5.8 shows the indirect effects of INT ($\beta = 0.053$, $t = 2.113$, $p < 0.05$), VIV ($\beta = 0.076$, $t = 2.873$, $p < 0.05$), and AUG ($\beta = 0.042$, $t = 3.929$, $p < 0.05$) on purchase intention. These results shows that AUG has the largest indirect effect on purchase intention. The table also shows the indirect effect of INT, VIV and AUG (respectively: interactivity, vividness, and decision comfort) on DCM (decision comfort) and the indirect effect of SPT (spatial presence) on PIN (purchase intention).

TABLE 5.8: Specific Indirect Effects

Path	Original Sample	STDEV	T statistics	P values
INT -> SPT -> DCM	0.143	0.067	2.113	0.035
VIV -> SPT -> DCM	0.308	0.094	3.271	0.001
AUG -> SPT -> DCM	0.231	0.056	4.157	0.000
SPT -> DCM -> PIN	0.515	0.090	5.727	0.000
INT -> SPT -> DCM -> PIN	0.101	0.053	1.925	0.054
VIV -> SPT -> DCM -> PIN	0.219	0.076	2.873	0.004
AUG -> SPT -> DCM -> PIN	0.165	0.042	3.929	0.000

5.5. TEST OF GROUP DIFFERENCES

Table 5.9 below shows the results of the independent sample t-test for differences between females and males. According to the results, there is no statistically significant difference between women and men. According to the t-test results, the effect of web-AR use in e-commerce on purchase intention does not differ between men and women. The significance values are higher than the cut-off value of 0.05.

TABLE 5.9: Independent Samples T-test for Differences between Female and Male

Construct	Gender	N	Mean	STDEV	t-test for Equality of Means		
					T	df	Sig. (2-tailed)
INT	Female	72	6.21	0.71	0.618	144	0.537
	Male	74	6.28	0.68			
VIV	Female	72	6.31	0.63	-1.390	144	0.167
	Male	74	6.15	0.77			
AUG	Female	72	6.23	0.71	-0.206	144	0.837
	Male	74	6.20	0.60			
SPT	Female	72	5.99	0.99	-0.601	144	0.548
	Male	74	5.88	1.20			
DCM	Female	72	6.06	1.07	-1.308	144	0.193
	Male	74	5.82	1.16			
PIN	Female	72	6.11	1.14	-1.288	144	0.200
	Male	74	5.85	1.33			

N: 146; 95% confidence interval; $p<0.05$ significance level

Table 5.10 below shows the independent sample t-test results for the differences between participants who used AR before participating in the study and participants who used AR before participating in the study. According to the results, there is no statistically significant difference between the participants who have used AR before and the participants who have not used AR before. According to the t-test results, the effect of using web-AR in e-commerce on purchase intention does not vary according to whether or not to use AR before participating in the study. Those who could not remember whether they had used AR before were not included in the test. Significance values are higher than the cut-off value of 0.05.

TABLE 5.10: Independent Samples T-test for AR Users and Non-Users before participating in the Study

Construct	Have you ever used augmented reality before taking this questionnaire?	N	Mean	STDEV	t-test for Equality of Means		
					T	df	Sig. (2-tailed)
INT	Yes	79	6.27	0.69	0.855	135	0.394
	No	58	6.17	0.71			
VIV	Yes	79	6.17	0.67	-0.911	135	0.364
	No	58	6.29	0.79			
AUG	Yes	79	6.21	0.67	-0.229	135	0.819
	No	58	6.23	0.64			
SPT	Yes	79	5.89	1.17	-0.373	135	0.710
	No	58	5.96	1.06			
DCM	Yes	79	5.96	1.24	0.480	135	0.632
	No	58	5.87	1.02			
PIN	Yes	79	6.00	1.33	0.436	135	0.633
	No	58	5.91	1.19			

N: 137; 95% confidence interval; $p<0.05$ significance level

Table 5.11 below shows the independent sample t-test results for the differences between the participants who purchased products or services using AR before participating in the study and the participants who did not purchase products or services using AR before participating in the study. According to the results, there is no statistically significant difference between the participants who have purchased products or services using AR before and the participants who have purchased products or services using AR before. According to the t-test results, the effect of web-AR use in e-commerce on purchase intention does not vary according to whether or not they purchased products or services using AR before participating in the study. Those who could not remember whether they had purchased products or services using web-AR before were not included in the test. Significance values are higher than the cut-off value of 0.05.

TABLE 5.11: Independent Sample T-test for those who purchased Products or Services with AR before participating in the Study and those who did not

Construct	Have you ever purchased a product or service using augmented reality?	N	Mean	STDEV	t-test for Equality of Means		
					T	Df	Sig. (2-tailed)
INT	Yes	31	6.37	0.58	1.166	137	0.246
	No	108	6.20	0.72			
VIV	Yes	31	6.16	0.80	-0.585	137	0.593
	No	108	6.25	0.68			
AUG	Yes	31	6.32	0.67	1.091	137	0.277
	No	108	6.18	0.64			
SPT	Yes	31	6.01	1.11	0.466	137	0.642
	No	108	5.90	1.11			
DCM	Yes	31	6.15	1.16	1.232	137	0.220
	No	108	5.87	1.12			
PIN	Yes	31	6.30	1.15	1.690	137	0.093
	No	108	5.87	1.27			

N: 139; 95% confidence interval; $p<0.05$ significance level

The results of the ANOVA test performed according to the age groups of the participants are in Table 5.12. There is no difference between age groups in the effect of web-AR experience on purchase intention. Different age groups are homogeneously distributed and do not differ in purchase intention.

TABLE 5.12: ANOVA Results by Age

Factors	Age Groups	N	Mean	STDEV	F	p
	18-25	37	6.13	0.76		
	26-30	57	6.26	0.74		
	31-35	15	6.51	0.52		
INT	**36-40**	10	6.13	0.59	0.919	0.471
	41-45	10	6.10	0.59		
	46+	17	6.37	0.60		
	Total	146	6.24	0.69		
	18-25	37	6.14	0.68		
	26-30	57	6.12	0.81		
	31-35	15	6.39	0.52		
VIV	**36-40**	10	6.14	0.69	1.557	0.176
	41-45	10	6.48	0.39		
	46+	17	6.55	0.60		
	Total	146	6.23	0.71		
	18-25	37	6.15	0.64		
	26-30	57	6.11	0.72		
	31-35	15	6.47	0.39		
AUG	**36-40**	10	6.16	0.69	1.341	0.250
	41-45	10	6.38	0.44		
	46+	17	6.42	0.64		
	Total	146	6.21	0.65		
	18-25	37	5.71	1.35		
	26-30	57	5.86	1.13		
	31-35	15	6.26	0.95		
SPT	**36-40**	10	5.70	0.81	1.380	0.236
	41-45	10	6.31	0.48		
	46+	17	6.32	0.80		
	Total	146	5.94	1.10		
	18-25	37	5.80	1.24		
	26-30	57	5.93	1.25		
	31-35	15	6.33	0.68		
DCM	**36-40**	10	5.66	1.10	0.658	0.656
	41-45	10	6.08	0.61		
	46+	17	6.04	0.96		
	Total	146	5.94	1.12		

Factors	Age Groups	N	Mean	STDEV	F	p
	18-25	37	5.80	1.57		
	26-30	57	5.98	1.33		
	31-35	15	6.42	0.71		
PIN	**36-40**	10	5.87	1.19	0.550	0.738
	41-45	10	6.07	0.70		
	46+	17	5.98	0.67		
	Total	146	5.98	1.24		

N: 146; 95% confidence interval; $p<0.05$ significance level

Table 5.13 contains the findings of the ANOVA test conducted in accordance with the participants' educational levels. The impact of a web-AR encounter on purchase intention is the same regardless of education level. The distribution of education levels is homogeneous, and purchase intentions are not different among them.

TABLE 5.13: ANOVA Results according to Educational Level

Factors	Age Groups	N	Mean	STDEV	F	p
	High school graduated	11	6.27	1.03		
	Undergraduate student	29	6.07	0.86		
	Undergraduate graduated	59	6.27	0.59		
INT	**Master's student**	27	6.36	0.55	0.507	0.770
	Master's graduated	13	6.28	0.74		
	PhD Students	7	6.29	0.52		
	Total	146	6.24	0.69		
	High school graduated	11	6.16	1.59		
	Undergraduate student	29	6.30	0.54		
	Undergraduate graduated	59	6.21	0.66		
VIV	**Master's student**	27	6.10	0.60	0.489	0.784
	Master's graduated	13	6.43	0.42		
	PhD Students	7	6.29	0.36		
	Total	146	6.23	0.71		
	High school graduated	11	6.69	1.94		
AUG	**Undergraduate student**	57	6.18	1.42	1.763	0.124
	Undergraduate graduated	15	6.22	0.79		

Factors	Age Groups	N	Mean	STDEV	F	p
	Master's student	10	6.09	1.08		
	Master's graduated	10	6.28	0.62		
	PhD Students	17	5.91	0.81		
	Total	146	6.21	1.10		
	High school graduated	11	5.78	1.39		
	Undergraduate student	57	5.74	1.24		
	Undergraduate graduated	15	6.13	1.07		
SPT	**Master's student**	10	5.67	1.24	1.303	0.287
	Master's graduated	10	6.22	0.66		
	PhD Students	17	5.84	0.78		
	Total	146	5.94	1.12		
	High school graduated	11	5.40	1.39		
	Undergraduate student	57	5.89	1.24		
	Undergraduate graduated	15	6.06	1.07		
DCM	**Master's student**	10	5.94	1.24	0.786	0.561
	Master's graduated	10	6.12	0.66		
	PhD Students	17	5.59	0.78		
	Total	146	5.94	1.12		
	High school graduated	11	6.15	1.46		
	Undergraduate student	57	5.77	1.69		
	Undergraduate graduated	15	6.10	1.01		
PIN	**Master's student**	10	6.09	1.18	0.572	0.721
	Master's graduated	10	5.74	0.83		
	PhD Students	17	5.57	1.57		
	Total	146	5.98	1.24		

N: 146; 95% confidence interval; $p<0.05$ significance level

The results of the ANOVA test performed by occupation of the participants are in Table 5.14. According to the ANOVA test results, the effect of Web-AR on purchase intention does not differ according to occupation, except for spatial presence. In order to analyze the difference in more detail, Scheffe analysis was applied because the difference between occupations was large. In the spatial presence factor, students and private sector employees differ from others in the perception of spatial presence. While performing the ANOVA test by occupation, retired, self-employed, and homemakers were excluded from the analysis due to the low number of participants.

TABLE 5.14: ANOVA Results by Occupation

Factors	Age Groups	N	Mean	STDEV	F	p
INT	**Student**	32	6.10	0.64	1.815	0.167
	Private Sector Employee	88	6.28	0.72		
	Public Officer	19	6.47	0.49		
	Total	139	6.26	0.68		
VIV	**Student**	32	6.19	0.50	0.118	0.889
	Private Sector Employee	88	6.26	0.79		
	Public Officer	19	6.27	0.55		
	Total	139	6.25	0.70		
AUG	**Student**	32	6.16	0.56	1.668	0.192
	Private Sector Employee	88	6.32	0.65		
	Public Officer	19	6.08	0.56		
	Total	139	6.25	0.62		
SPT *	**Student ****	32	5.53	1.44	2.253	0.033
	Private Sector Employee **	88	6.12	0.98		
	Public Officer	19	6.16	0.76		
	Total	139	5.97	1.10		
DCM	**Student**	32	5.78	1.42	0.470	0.518
	Private Sector Employee	88	6.04	1.07		
	Public Officer	19	5.97	0.74		
	Total	139	5.97	1.18		
PIN	**Student**	32	5.67	1.66	0.979	0.385
	Private Sector Employee	88	6.11	1.10		
	Public Officer	19	6.09	1.10		
	Total	139	6.00	1.25		

N: 139; 95% confidence interval; $p<0.05$ significance level; *differing factors; ** differing variables

6. DISCUSSION ON RESULTS

The research results of this thesis, which was conducted within the scope of the S-O-R model to understand the impact of web-AR technology on purchasing behavior in online furniture retailing, are discussed below. Park and Lee (2004) define one of the biggest risks of e-commerce as the fact that the products that customers purchase through the online channel are different from the products they expect. As a result of this study, it was revealed that web-AR can change customer risk perception in online furniture sales as it is a technology that allows customers to try the furniture in their homes before buying it.

Before discussing the hypotheses of the study, the characteristics of the sample should be specified. The ratio of male and female participants in the study is almost equal. Participants with different levels of education are at least high school graduates. Moreover, 72.6% of the participants in the study had a bachelor's degree. When the age group of the participants is analyzed, it is seen that those between the ages of 18 and 35 constitute 74.7% of the participants. The study was adapted for a sample of young participants. More than half of the sample, which consists of different occupational groups, consists of private sector employees. The study focused especially on people who need and can afford furniture. Moreover, the participants in the study expressed a positive opinion about the widespread use of e-based augmented reality in e-commerce.

Within the framework of the S-O-R model used in this thesis, the effect of interactivity, vividness, and augmentation, which are the characteristics of AR, on spatial presence was examined, then the relationship between spatial presence and decision comfort was examined, and finally, the effect of decision comfort on purchase intention was examined. Interactivity, vividness, and augmentation, which are exogenous variables in the model, explain 66.8% of the variance in spatial presence, indicating that the model

shows a good fit. Spatial presence explains 52.3% of the variance in decision comfort, indicating a good fit for the model. Decision comfort explains 50.6% of the variance in purchase intention, indicating a good fit for the model. The findings demonstrate that the study model successfully describes the connections between the variables employed. The fact that the variables' relationships have high variance explanation rates indicates that the model is good at explaining the dependent variables in a trustworthy and valid manner.

Hypotheses H_{1a}, H_{1b}, and H_{1c} suggest that AR's characteristic features of interactivity, vividness, and augmentation, respectively, have a positive effect on spatial presence, and all of these hypotheses were supported.

Hypothesis H_{1a} suggests that interactivity affects spatial presence positively. This hypothesis is accepted according to the research results. With web-AR technology, interactivity is expected to affect spatial presence as users can rotate the product 360 degrees and have full control over the virtual furniture. In previous studies, Wang et al. (2021) suggested that interactivity positively affects spatial presence in the context of AR. Kumar and Srivastava (2022) showed that interactivity has a positive effect on spatial presence in their research on extended spatial presence theory. Moreover, there is evidence in the literature that interactivity has a positive effect on spatial presence (Regenbrecht & Schubert, 2002; Walther et al., 2005; Ruyter et al., 2020).

Hypothesis H_{1b} suggests that vividness affects spatial presence positively. Hypothesis H_{1b} is supported according to the research results. It is expected that users' spatial presence will increase due to the increased vividness of the virtual furniture during the use of web-AR. When previous studies are examined, D'angiulli et al. (2013) suggest that vividness has a positive effect on spatial presence. Furthermore, Wang et al. (2021) claim that spatial presence is positively affected by vividness in the AR context. There are studies in the literature suggesting that vividness has a positive effect on spatial presence (Wu & Lai, 2021; Ruyter et al., 2020).

Hypothesis H_{1c} claims that augmentation positively affects spatial presence. Hypothesis H_{1c} is accepted according to the research results. Augmentation is considered to be one of the key characteristics of AR as reality enhancement. In previous studies, Kumar and Srivastava (2022) argued that augmentation positively affects spatial

presence. Moreover, there are studies showing that spatial presence is positively affected by augmentation (Wang et al., 2021).

Hypothesis 2 suggests that spatial presence positively affects decision comfort, and the results of the study support this hypothesis. The customer's feeling of "being here" through web-AR is expected to increase decision comfort. In previous studies, Hilken et al. (2017) suggested that spatial presence positively affects decision comfort. Moreover, there are studies in the literature that claim that spatial presence positively affects decision comfort (Wang et al., 2021; Sengupta & Cao, 2022).

Hypothesis 3 suggests that decision comfort positively influences purchase intention. This hypothesis is accepted according to the research findings. Web-AR is expected to provide pre-purchase decision comfort by allowing customers to try the furniture virtually at home. In previous studies, Wang et al. (2021) suggested a positive relationship between decision comfort and purchase intention. In the literature, there are studies showing that decision comfort affects purchase intention positively (Liu et al., 2022).

Finally, it is necessary to discuss whether there are different decision-making processes among different groups. There is no difference between the participants in the study according to their gender, whether they have used AR before, or whether they have purchased products or services using AR before.

ANOVA tests were conducted according to different age groups, different education levels, and different occupations. According to the ANOVA test results, no difference was observed in the effect of web-AR on purchase intention in online furniture retailing among different age groups and different education levels. However, according to the results of the ANOVA test conducted by occupation, the effect of web-AR on purchase intention in online furniture retailing differs between students and private sector employees. Because the gap between professions was considerable, Scheffe analysis was used to examine it in more detail. In terms of spatial presence, students and private sector employees perceive it differently than others.

All hypotheses of this thesis, which tried to analyze the effect of using web-AR technology in online furniture retailing on customer behavior by using the S-O-R model,

were confirmed. Differences between groups were determined by different analysis methods. In addition, demographic data were examined, and users' knowledge and demographic data about AR were analyzed.

7. CONCLUCION

This study investigates whether the use of web-based augmented reality technology in e-commerce influences customers' purchase intentions in furniture retailing. According to the research results, web-AR technology has a positive effect on customers' purchase intentions.

The research results show that the use of web-AR technology in online furniture technology offers customers an interactive and realistic online shopping experience. Web-AR technology has had a positive influence on customers' purchase intentions in terms of enabling customers to try products before purchasing, to understand whether the product is what they are looking for, and to make a clearer visualization. This facilitates customers' decision-making processes and also provides them with more information about the product.

The academic implications, managerial implications, and limitations of this thesis are analyzed in detail below.

7.1. ACADEMIC IMPLICATIONS

As an academic contribution, the most important feature of this research is that it uses a simplified version of the S-O-R model proposed by Wang et al. (2021). Since the use of the S-O-R model is limited in the studies on AR, this study also provides information on the use of the S-O-R model in the context of AR use in online retailing. Another academic implication of the study is that it tests the S-O-R model in an AR context.

The first academic contribution of this study is to investigate web-based augmented reality and the impact of the use of web-based augmented reality in furniture retailing on customer purchase intention. Previous studies have not investigated how web-based AR works, how web-based AR affects the cognitive processes of customers who want to buy furniture through the online channel, or how customers who use web-based AR react to the product. In this context, this study contributes to the literature.

The second academic implication of this study is to introduce the S-O-R model to the literature by simplifying the model proposed by Wang et al. (2021). The S-O-R model used in this study is characterized by interactivity, vividness, and augmentation as features of AR. In the organism part of the S-O-R model, it aims to explore customers' cognitive processes with spatial presence and decision comfort. The response section reveals the reactions of web-AR users.

The third academic implication is that although the sample size in this study is small, it differs from previous studies in that it includes participants from different socio-economic and age groups. Rauschnabel (2018) argues that students are the first to discover new technologies. However, a study of students to measure their purchase intentions in furniture retailing may yield incomplete results given their economic status. For this reason, although the sample of this study is relatively small, it was selected from a wider community.

7.2. MANAGERIAL IMPLICATIONS

The results of the study revealed that 39.2% of the participants who used augmented reality before participating in this study had previously shopped using augmented reality. More than a third of respondents who have used augmented reality before have used AR technology to purchase products.

The first managerial implication is that web-AR's characteristic features increase the customer's perception of spatial presence and offer a more interesting, intriguing, unique, and immersive shopping experience. As a result, customers' decision-making comfort and purchase intention increase. For this reason, web-AR technology can create

a new marketing strategy for marketers. The study offers strategies and solutions in online channels for marketers in furniture retailing in Türkiye. Thanks to web-AR, customers can shop in a livelier environment by entering both a hedonistic and interactive process in their online furniture shopping. Confirming the hypotheses of the study, it seems that customers can shop more in the online furniture sector thanks to this web-AR, and this will provide more benefits for the brand perception of companies using web-AR.The second managerial implication is that web-based AR increases decision comfort and purchase intention by informing customers about the product and enabling them to evaluate it more accurately.

The third managerial implication is that web-AR increases decision comfort and purchase intention by personalizing the customer experience in online furniture retailing.

The fourth academic implication is that increasing the technical capacity of web-AR will provide more immersion for the customer. The development of AR's technical features will enable customers to understand AR's features more clearly and make better decisions about the product.

The fifth managerial implication is that the studies conducted in the context of AR and the results of this study show that customers are open to innovation in the online shopping environment and strengthen their purchase intention by rebuilding their decision-making processes.

The last managerial implication reveals that 39.6% of the participants who used AR before the demographic characteristics of this study were examined purchased products or services with AR. This shows that online shopping customers in Türkiye also use AR commercially. He also stated that the participants in the study participated in the use of web-based AR technology in e-commerce.

7.3. LIMITATIONS OF THE STUDY

This study has significant academic limitations. First, the sampling constraints must be evaluated. Because this study was only done in Istanbul, its applicability to other

cities may be restricted. This may limit the broader population's representation of the results. Furthermore, the limited sample size restricts the generalizability of the findings.

Secondly, the study may not have included external factors related to online furniture retailing. The study should be evaluated with this situation in mind.

The third limitation is that the research could not be done more comprehensively due to the budget. More detailed analyses can be obtained by applying this study to more efficient and wider environments with higher budgets. In addition, this study was carried out in furniture online retailing. In other product categories, the effect of web-AR on customers' purchase intentions may differ.

Researchers must be aware of these constraints in order to appropriately evaluate and generalize their findings. The validity and generalizability of the study's conclusions should be more carefully examined, and the limitations should be highlighted. Future research must also employ more thorough approaches.

8. LIST OF REFERENCES

Ahn, S. S., Nowak, K. L., & Bailenson, J. N. (2022). Unintended consequences of spatial presence on learning in virtual reality. Computers & Education, 186, 104532. https://doi.org/10.1016/j.compedu.2022.104532

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Arghashi, V., & Yüksel, C. A. (2022). Interactivity, Inspiration, and Perceived Usefulness! How retailers' AR-apps improve consumer engagement through flow. Journal of Retailing and Consumer Services, 64, 102756. https://doi.org/10.1016/j.jretconser.2021.102756

Azuma, R. (1997). A Survey of Augmented Reality. Presence: Teleoperators & Virtual Environments, 6(4), 355–385. https://doi.org/10.1162/pres.1997.6.4.355

Babin, L. A., & Burns, A. C. (1998). A modified scale for the measurement of communication-evoked mental imagery. Psychology & Marketing, 15(3), 261–278. https://doi.org/10.1002/(SICI)1520-6793(199805)15:3<261::AID-MAR4>3.0.CO;2-8

Bagozzi, R. P. (1986), Principles of Marketing Management, Science Research Associates, Inc., Chicago.

Baker, J., Levy, M., & Grewal, D. (1992). An experimental approach to making retail store environmental decisions. Journal of Retailing, 68(4), 445–460.

Bakırtaş, H. 2013. "S-O-R Paradigması Temelinde Mağaza Atmosferi ve Duyguların Pazarlamadaki Önemi: Bir Literatür İncelemesi" Dergi Park, Cilt:2013, Sayı 2, 47-55.

Bal, G., & Içten, T. (2019). Web Tabanlı Artırılmış Gerçeklik Sanal Giyinme Uygulamasının Tasarımı ve Test Edilmesi. Gazi Üniversitesi Fen Bilimleri Dergisi, 7(2), 425–438. https://doi.org/10.29109/gujsc.530684

Beck, M., & Crié, D. (2018). I virtually try it . . . I want it ! Virtual Fitting Room: A tool to increase on-line and off-line exploratory behavior, patronage and purchase intentions. Journal of Retailing and Consumer Services, 40, 279–286. https://doi.org/10.1016/j.jretconser.2016.08.006

Beck, M., & Crié, D. (2018). I virtually try it . . . I want it! Virtual Fitting Room: A tool to increase on-line and off-line exploratory behavior, patronage and purchase intentions. Journal of Retailing and Consumer Services, 40, 279–286. https://doi.org/10.1016/j.jretconser.2016.08.006

Bellizzi, J. A., & Hite, R. E. (1992). Environmental color, consumer feelings, and purchase likelihood. Psychology & Marketing, 9(5), 347–363. https://doi.org/10.1002/mar.4220090502

Billinghurst, M., & Kato, H. (2002). Collaborative augmented reality. Communications of the ACM, 45(7), 64–70. https://doi.org/10.1145/514236.514265

Bimber, O., & Raskar, R. (2006). Modern approaches to augmented reality. https://doi.org/10.1145/1185657.1185796

Bordens, K. S. & Abbott, B. B. 2002. Research Design and Methods: A process approach. 5th Ed. New York, NY, USA: McGraw-Hill.

Boyles, B.D. (2017). Virtual Reality and Augmented Reality in Education, United States Military Academy, West Point, NY, 2017.

Brengman, M., Willems, K., & Van Kerrebroeck, H. (2018). Can't touch this: the impact of augmented reality versus touch and non-touch interfaces on perceived ownership. Virtual Reality, 23(3), 269–280. https://doi.org/10.1007/s10055-018-0335-6

Broniarczyk, S. M., & Griffin, J. G. (2014). Decision Difficulty in the Age of Consumer Empowerment. In Journal of Consumer Psychology (Vol. 24, Issue 4, pp. 608–625). Elsevier BV. https://doi.org/10.1016/j.jcps.2014.05.003

Bulearca, M.; Tamarjan, D. (2010): Augmented Reality: A Sustainable Marketing Tool? in: Global Business & Management Research, 2 (2/3), 237–252. http://gbmrjournal.com/pdf/Bulearca%20&%20Tamarjan,%202010.pdf

Caboni, F. & Hagberg, J. (2019). Augmented reality in retailing: a review of features, applications and value. International Journal of Retail & Distribution Management, 47(11), 1125-1140. http://dx.doi.org/10.1108/IJRDM-12-2018-0263

Chang, H. Y., & Chen, S. (2008). The impact of online store environment cues on purchase intention. Online Information Review, 32(6), 818–841. https://doi.org/10.1108/14684520810923953

Chebat, J., & Michon, R. (2003). Impact of ambient odors on mall shoppers' emotions, cognition, and spending. Journal of Business Research, 56(7), 529–539. https://doi.org/10.1016/s0148-2963(01)00247-8

Chen, R., Perry, P., Boardman, R., & McCormick, H. (2021). Augmented reality in retail: a systematic review of research foci and future research agenda. International Journal of Retail & Distribution Management, 50(4), 498–518. https://doi.org/10.1108/ijrdm-11-2020-0472

Chin, W. W. 1998. Commentary: Issues and Opinion on Structural Equation Modelling. MIS Quarterly, 22(1): 7 – 16.

Coyle, J. L., & Thorson, E. (2001). The Effects of Progressive Levels of Interactivity and Vividness in Web Marketing Sites. Journal of Advertising, 30(3), 65–77. https://doi.org/10.1080/00913367.2001.10673646

D'Angiulli, A., Runge, M., Faulkner, A., Zakizadeh, J., Chan, A., & Morcos, S. (2013). Vividness of Visual Imagery and Incidental Recall of Verbal Cues, When Phenomenological Availability Reflects Long-Term Memory Accessibility. Frontiers in Psychology, 4. https://doi.org/10.3389/fpsyg.2013.00001

Dacko, S. G. (2017). Enabling smart retail settings via mobile augmented reality shopping apps. Technological Forecasting and Social Change, 124, 243–256. https://doi.org/10.1016/j.techfore.2016.09.032

De Ruyter, K., Heller, J., Hilken, T., Chylinski, M., De Ruyter, K., & Mahr, D. (2020). Seeing with the Customer's Eye: Exploring the Challenges and Opportunities of AR Advertising. Journal of Advertising, 49(2), 109–124. https://doi.org/10.1080/00913367.2020.1740123

Deliçay, M. 2021. "Perakende E-Ticaretin Yükselişi - Fırsatlar, Sorunlar ve Öneriler", Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, Yayın No: 0019. https://www.sbb.gov.tr/wp-content/uploads/2021/01/Perakende_E-Ticaretin_Yukselisi.pdf, Last accessed: 23 December 2022.

Demirci, Y. D. D. S. & Efe, P. D. H. (2006). Türkiye Mobilya Endüstrisinin Yapısı ve Bölgesel Dağılımı . Kastamonu University Journal of Forestry Faculty , 6 (1) , 120-134 . Retrieved from https://dergipark.org.tr/tr/pub/kastorman/issue/17246/180163

Denscombe, M. (2010). The good research guide: For small-scale social research projects. McGraw-Hill Education.

Efron, B. (1987). Better Bootstrap Confidence Intervals. Journal of the American Statistical Association, 82(397), 171. https://doi.org/10.2307/2289144

Eyüboğlu, E. (2011): Augmented Reality as an Exciting Online Experience: Is it Really Beneficial for Brands?, in: International Journal of Social Sciences and Humanity Studies, 3 (1), 113–123. http://www.sobiad.org/eJOURNALS/journal_IJSS/arhieves/2011_1/ezgi_eyuboglu.pdf

Fiore, A. M., Kim, J., & Lee, H. (2005). Effect of image interactivity technology on consumer responses toward the online retailer. Journal of Interactive Marketing, 19(3), 38–53. https://doi.org/10.1002/dir.20042

Flavián, C., Gurrea, R., & Ors, C. (2017). The influence of online product presentation videos on persuasion and purchase channel preference: The role of imagery fluency and need for touch. Telematics and Informatics, 34(8), 1544–1556. https://doi.org/10.1016/j.tele.2017.07.002

Flavián, C., Gurrea, R., & Orús, C. (2016). Choice confidence in the webrooming purchase process: The impact of online positive reviews and the motivation

to touch. Journal of Consumer Behaviour, 15(5), 459–476. https://doi.org/10.1002/cb.1585

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, 18(1), 39. https://doi.org/10.2307/3151312

Ganapathy, S.; Anderson, G. J.; Kozintsev, I. V. (2011): MAR Shopping Assistant Usage: Delay, Error, and Utility, in: Proceeding of the IEEE Virtual Reality Conference, 207–208. https://doi.org/10.1109/vr.2011.5759471

Gervautz, M., & Schmalstieg, D. (2012). Anywhere Interfaces Using Handheld Augmented Reality. IEEE Computer, 45(7), 26–31. https://doi.org/10.1109/mc.2012.72

Goh, E. S., Sunar, M. S., & Ismail, A. W. (2019). 3D Object Manipulation Techniques in Handheld Mobile Augmented Reality Interface: A Review. IEEE Access, 7, 40581–40601. https://doi.org/10.1109/access.2019.2906394

Gorsuch, R. L. (1983), Factor Analysis (2nd. Ed). Hillsdale, NJ: Erlbaum.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. The Journal of Marketing Theory and Practice, 19(2), 139–152. https://doi.org/10.2753/mtp1069-6679190202

Hair, J. F., Sarstedt, M., & Ringle, C. M. (2019). Rethinking some of the rethinking of partial least squares. European Journal of Marketing, 53(4), 566–584. https://doi.org/10.1108/ejm-10-2018-0665

Haire, M. (1950). Projective Techniques in Marketing Research. Journal of Marketing, 14(5), 649–656. https://doi.org/10.1177/002224295001400501

Haumer, F., Kolo, C., & Reiners, S. (2020). The impact of augmented reality experiential marketing on brand equity and buying intention. Journal of Brand Strategy, 8(4), 368-387.

Heeter, C. (2000). Interactivity in the Context of Designed Experiences. Journal of Interactive Advertising, 1(1), 3–14. https://doi.org/10.1080/15252019.2000.10722040

Heller, J., Chylinski, M., De Ruyter, K., Mahr, D., & De Ruyter, K. (2019). Let Me Imagine That for You: Transforming the Retail Frontline Through Augmenting Customer Mental Imagery Ability. Journal of Retailing, 95(2), 94–114. https://doi.org/10.1016/j.jretai.2019.03.005

Henseler, J. (2017). Partial least squares path modeling. In Advanced methods for modeling markets (pp. 361-381). Springer, Cham.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hilken, T., De Ruyter, K., Chylinski, M., Mahr, D., & De Ruyter, K. (2017). Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences. Journal of the Academy of Marketing Science, 45(6), 884–905. https://doi.org/10.1007/s11747-017-0541-x

Hoffman, D. L., & Novak, T. P. (2009). Flow Online: lessons learned and future prospects. Journal of Interactive Marketing, 23(1), 23–34. https://doi.org/10.1016/j.intmar.2008.10.003

Hong H. (2006). Augmented Virtual Environments. Optics and Photonics News, OSN. https://www.optica-opn.org/opn/media/Images/PDFs/10569_21638_108591.pdf?ext=.pdf Last accessed: 17 December 2022

Hopp, T., & Gangadharbatla, H. (2016). Novelty Effects in Augmented Reality Advertising Environments: The Influence of Exposure Time and Self-Efficacy. Journal of Current Issues and Research in Advertising, 37(2), 113–130. https://doi.org/10.1080/10641734.2016.1171179

Houston, M. J., & Rothschild, M. L. (1977). A Paradigm for Research on Consumer Involvement.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Huang, T., & Liao, S. (2015). A model of acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness. Electronic Commerce Research, 15(2), 269–295. https://doi.org/10.1007/s10660-014-9163-2

Huang, T., & Liao, S. (2017). Creating e-shopping multisensory flow experience through augmented-reality interactive technology. Internet Research, 27(2), 449–475. https://doi.org/10.1108/intr-11-2015-0321

Huang, T., & Liu, F. (2014). Formation of augmented-reality interactive technology's persuasive effects from the perspective of experiential value. Internet Research, 24(1), 82–109. https://doi.org/10.1108/intr-07-2012-0133

Hubona, G. S. (2010). Structural equation modelling using SmartPLS: A partial least squares path modelling tool, August 2-3, Hamburg, Germany.

Hul, M. K., Dubé, L., & Chebat, J. (1997). The impact of music on consumers' reactions to waiting for services. Journal of Retailing, 73(1), 87–104. https://doi.org/10.1016/s0022-4359(97)90016-6

İnal, M. E. & Toksarı, M. (2006). Mobilyacılık Sektöründe Karşılaşılan Pazarlama Sorunları ve bu Sorunlara Çözüm Üretmeye Yönelik bir Araştırma: Kayseri Örneği,. Uluslararası Yönetim İktisat ve İşletme Dergisi , 2 (4) , 105-121. Retrieved from https://dergipark.org.tr/tr/pub/ijmeb/issue/54837/750789

Javornik, A. (2016a). 'It's an illusion, but it looks real!' Consumer affective, cognitive and behavioural responses to augmented reality applications. Journal of Marketing Management, 32(9–10), 987–1011. https://doi.org/10.1080/0267257x.2016.1174726

Javornik, A. (2016b). Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour. Journal of Retailing and Consumer Services, 30, 252–261. https://doi.org/10.1016/j.jretconser.2016.02.004

Jeong, S. Y., Fiore, A. M., Niehm, L. S., & Lorenz, F. O. (2009). The role of experiential value in online shopping. Internet Research, 19(1), 105–124. https://doi.org/10.1108/10662240910927858

Jessen, A., Hilken, T., Chylinski, M., Mahr, D., Heller, J., De Ruyter, K., & De Ruyter, K. (2020). The playground effect: How augmented reality drives creative customer engagement. Journal of Business Research, 116, 85–98. https://doi.org/10.1016/j.jbusres.2020.05.002

Jiang, Z., & Benbasat, I. (2007). The Effects of Presentation Formats and Task Complexity on Online Consumers' Product Understanding. Management Information Systems Quarterly, 31(3), 475. https://doi.org/10.2307/25148804

Joines, J. L., Scherer, C. W., & Scheufele, D. A. (2003). Exploring motivations for consumer Web use and their implications for e-commerce. Journal of Consumer Marketing, 20(2), 90–108. https://doi.org/10.1108/07363760310464578

Kahneman D., Knetsch J.and Thaler R., Journal of Political Economy, 1990, vol. 98, issue 6, 1325-48

Kang, J. M. (2014). Augmented reality and motion capture apparel e-shopping values and usage intention. International Journal of Clothing Science and Technology, 26(6), 486–499. https://doi.org/10.1108/ijcst-05-2013-0055

Kim, A. J., & Ko, E. (2010). Impacts of Luxury Fashion Brand's Social Media Marketing on Customer Relationship and Purchase Intention. Journal of Global Fashion Marketing, 1(3), 164–171. https://doi.org/10.1080/20932685.2010.10593068

Kim, H. S., Lee, J. H., Mun, J. M., & Johnson, K. K. P. (2017). Consumer adoption of smart in-store technology: assessing the predictive value of attitude versus beliefs in the technology acceptance model. International Journal of Fashion Design, Technology and Education, 10(1), 26–36. https://doi.org/10.1080/17543266.2016.11

Kim, H., & Hyun, M. Y. (2016). Predicting the use of smartphone-based Augmented Reality (AR): Does telepresence really help? Computers in Human Behavior, 59, 28–38. https://doi.org/10.1016/j.chb.2016.01.001

Kim, H., & Lennon, S. J. (2010). E-atmosphere, emotional, cognitive, and behavioral responses. Journal of Fashion Marketing and Management, 14(3), 412–428. https://doi.org/10.1108/13612021011061861

Kim, J., Kim, M., & Lennon, S. J. (2009). Effects of web site atmospherics on consumer responses: music and product presentation. Direct Marketing: An International Journal, 3(1), 4–19. https://doi.org/10.1108/17505930910945705

Kim, T. Y., & Biocca, F. (2006). Telepresence via Television: Two Dimensions of Telepresence May Have Different Connections to Memory and Persuasion. [1]. Journal of Computer-Mediated Communication, 3(2), 0. https://doi.org/10.1111/j.1083-6101.1997.tb00073.x

Kiousis, S. (2002). Interactivity: a concept explication. New Media & Society, 4(3), 355–383. https://doi.org/10.1177/146144480200400303

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

Köksal, B. (2017). Türkiye'de Mobilya Sektörünün Gelişimi Kayseri Örneği, İleri Teknoloji Bilimleri Dergisi, 410-421. Retrieved from https://dergipark.org.tr/tr/pub/duzceitbd/issue/33124/363867 Last accessed: 06 December 2022

Kolay İhracat Platformu. (2021) Mobilya Sektör Analizi, https://www.kolayihracat.gov.tr/sektorler/mobilya, Last accessed: 15 December 2022.

Kotler, P. (1973), "Atmospherics as a Marketing Tools", Journal of Retailing, 49(4), 48-64.

Kowalczuk, P., Siepmann, C., & Adler, J. (2021). Cognitive, affective, and behavioral consumer responses to augmented reality in e-commerce: A comparative study. Journal of Business Research, 124, 357–373. https://doi.org/10.1016/j.jbusres.2020.10.050

Kumar, H. (2021). Augmented reality in online retailing: a systematic review and research agenda. International Journal of Retail & Distribution Management, 50(4), 537–559. https://doi.org/10.1108/ijrdm-06-2021-0287

Kumar, H., & Srivastava, R. (2022). Exploring the role of augmented reality in online impulse behaviour. *International Journal of Retail & Distribution Management*, *50*(10), 1281–1301. https://doi.org/10.1108/ijrdm-11-2021-0535

Kurt, G., & Ince, G. (2020). ARgent: Web Tabanlı Dinamik İçerik Destekli Artırılmış Gerçeklik Geliştirme Altyapısı. Europan Journal of Science and Technology, 244–257. https://doi.org/10.31590/ejosat.779946

Lee, K. M. (2004). Presence, explicated. Communication Theory, 14(1), 27–50. https://doi.org/10.1111/j.1468-2885.2004.tb00302.x.

Li, H., Daugherty, T., & Biocca, F. (2002). Impact of 3-D Advertising on Product Knowledge, Brand Attitude, and Purchase Intention: The Mediating Role of Presence. Journal of Advertising, 31(3), 43–57. https://doi.org/10.1080/00913367.2002.10673675

Liu, F., Wang, Y., Dong, X., & Zhao, H. (2022). Marketing by live streaming: How to interact with consumers to increase their purchase intentions. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.933633

Malhotra, N.K. 2010. Marketing Research: An Applied Orientation. 6th Ed. New Jersey, USA: Pearson.

Mauroner, O.; Le, L.; Best, S. (2016): Augmented Reality in Advertising and Brand Communication: An Experimental Study, in: International Journal of Information and Communication Engineering, 10 (2), 422–425. https://web.archive.org/web/20201226170610/https://zenodo.org/record/1338858/files/10003504.pdf, Last accessed: 06 December 2022

McLean, G., & Wilson, A. (2019). Shopping in the digital world: Examining customer engagement through augmented reality mobile applications. Computers in Human Behavior, 101, 210–224. https://doi.org/10.1016/j.chb.2019.07.002

Mehrabian, A., & Russell, J. A. (1974). An Approach to Environmental Psychology. MIT Press (MA).

Mejía-Gutiérrez, R., Fischer, X., & Bennis, F. (2008). Virtual knowledge modelling for distributed teams: towards an interactive design approach. International Journal of Networking and Virtual Organisations. https://doi.org/10.1504/ijnvo.2008.017009

Meydanoğlu, E. S. B., Klein, M., & Çilingirtürk, A. M. (2015). Impacts of QR codes on buying decision process of Turkish consumers. In International journal of technology marketing (Vol. 10, Issue 3, p. 287). Inderscience Publishers. https://doi.org/10.1504/ijtmkt.2015.070643

Minsky, M. (1980) Telepresence. OMNI Magazine, 44-52. https://philpapers.org/rec/MINT

Moriuchi, E. (2018). Is That Really an Honest Online Review? The Effectiveness of Disclaimers in Online Reviews. The Journal of Marketing Theory and Practice, 26(3), 309–327. https://doi.org/10.1080/10696679.2018.1451257

Nakip, M. (2013). Pazarlamada Araştırma Teknikleri. Ankara: Seçkin Yayıncılık.

Nikhashemi, S. R., Knight, H. H., Nusair, K., & Liat, C. B. (2021). Augmented reality in smart retailing: A (n) (A) Symmetric Approach to continuous intention to use retail brands' mobile AR apps. Journal of Retailing and Consumer Services, 60, 102464. https://doi.org/10.1016/j.jretconser.2021.102464

Nitika, N., Sharma, T. K., Rajvanshi, S., & Kishore, K. (2021). A study of Augmented Reality performance in web browsers (WebAR), " 2nd International Conference on Computational Methods in Science & Technology (ICCMST), Mohali, India, 2021, pp. 281-286, https://doi.org/10.1109/iccmst54943.2021.00065

Nitika, N., Sharma, T. K., Rajvanshi, S., & Kishore, K. (2021b). A study of Augmented Reality performance in web browsers (WebAR). https://doi.org/10.1109/iccmst54943.2021.00065

Olsson, T., & Salo, M. (2011). Online user survey on current mobile augmented reality applications. International Symposium on Mixed and Augmented Reality. https://doi.org/10.1109/ismar.2011.6092372

Olsson, T., Kärkkäinen, T., Lagerstam, E., & Ventä-Olkkonen, L. (2012). User evaluation of mobile augmented reality scenarios. Journal of Ambient Intelligence and Smart Environments, 4(1), 29–47. https://doi.org/10.3233/ais-2011-0127

Olsson, T.; Lagerstam, E.; Kärkkäinen, T.; Väänänen-Vainio-Mattila, K. (2013): Expected User Experience of Mobile Augmented Reality Services: A User Study in the Context of Shopping Centres, in: Personal and Ubiquitous Computing, 17 (2), 287–304.

Özcan, H., Şahin, H., Çira, O., & Koca, P.P. (2022). Otizm Spektrum Bozukluğu Gösteren Öğrenciler İçin Oyun-tabanlı Artırılmış Gerçeklik Uygulaması Tasarlama ve Geliştirme. Bilgi ve İletişim Teknolojileri Dergisi. https://doi.org/10.53694/bited.1177541

Ozturkcan, S. (2021). Service innovation: Using augmented reality in the IKEA Place app. Journal of Information Technology Teaching Cases, 11(1), 8–13. https://doi.org/10.1177/2043886920947110

Pan, Q., & Chen, D. (2010). Augmented reality in e-commerce with markerless tracking. https://doi.org/10.1109/icime.2010.5478308

Pantano, E., & Servidio, R. (2012). Modeling innovative points of sales through virtual and immersive technologies. Journal of Retailing and Consumer Services, 19(3), 279–286. https://doi.org/10.1016/j.jretconser.2012.02.002

Pantano, E., Rese, A., & Baier, D. (2017). Enhancing the online decision-making process by using augmented reality: A two country comparison of youth markets. Journal of Retailing and Consumer Services, 38, 81–95. https://doi.org/10.1016/j.jretconser.2017.05.011

Park, J. Y., & Lee, W. (2004). Augmented E-commerce: Making Augmented Reality Usable in Everyday E-commerce with Laser Projection Tracking. In Lecture Notes in Computer Science. Springer Science Business Media. https://doi.org/10.1007/978-3-540-30493-7_22

Parker, J. B., Lehmann, D. R., & Xie, Y. (2016). Decision comfort. Journal of Consumer Research, 43(1), 113–133. https://doi.org/10.1093/jcr/ucw010

Pavlik, J. V. (1996). New Media Technology: Cultural and Commercial Perspectives. Allyn & Bacon.

Peter, J. P., & Olson, J. C. (2008). Consumer behavior and marketing strategy. Boston: McGraw-Hill/Irwin.

Phillips, D. M., Olson, J. C., & Baumgartner, H. (1995). Consumption visions in consumer decision making. Advances in Consumer Research, 22, 280–284.

Poncin, I., & Mimoun, M. S. B. (2014). The impact of "e-atmospherics" on physical stores. Journal of Retailing and Consumer Services, 21(5), 851–859. https://doi.org/10.1016/j.jretconser.2014.02.013

Poushneh, A. (2018). Augmented reality in retail: A trade-off between user's control of access to personal information and augmentation quality. Journal of Retailing and Consumer Services, 41, 169–176. https://doi.org/10.1016/j.jretconser.2017.12.010

Poushneh, A.; Vasquez-Parraga, A. Z. (2017a): Customer Dissatisfaction and Satisfaction with Augmented Reality in Shopping and Entertainment, in: Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 30, 1–22.

Poushneh, A.; Vasquez-Parraga, A. Z. (2017b): Discernible Impact of Augmented Reality on Retail Customer's Experience, Satisfaction and Willingness to Buy, in: Journal of Retailing and Consumer Services, 34, 229–234. https://doi.org/10.1016/j.jretconser.2016.10.005

Qiao, X., Ren, P., Dustdar, S., Liu, L., Ma, H., & Chen, J. (2019b). Web AR: A Promising Future for Mobile Augmented Reality—State of the Art, Challenges, and Insights. Proceedings of the IEEE, 107(4), 651–666. https://doi.org/10.1109/jproc.2019.2895105

Qin, H., Peak, D. A., & Prybutok, V. R. (2021). A virtual market in your pocket: How does mobile augmented reality (MAR) influence consumer decision making? Journal of Retailing and Consumer Services, 58, 102337. https://doi.org/10.1016/j.jretconser.2020.102337

Ramdani, A. a. U., Pankaj, K., Sander, D. J., Siddharth, G. G., Sherif, H., & Volker, V. (2022). Three-dimensional morphometric analysis and statistical distribution of the Early Kimmeridgian Hanifa Formation stromatoporoid/coral buildups, central Saudi Arabia. Marine and Petroleum Geology, 146, 105934. https://doi.org/10.1016/j.marpetgeo.2022.105934

Rauschnabel, P. A., Felix, R., & Hinsch, C. (2019). Augmented reality marketing: How mobile AR-apps can improve brands through inspiration. Journal of Retailing and Consumer Services, 49, 43–53. https://doi.org/10.1016/j.jretconser.2019.03.004

Rauschnabel, P. A., Felix, R., & Hinsch, C. (2019b). Augmented reality marketing: How mobile AR-apps can improve brands through inspiration. Journal of Retailing and Consumer Services, 49, 43–53. https://doi.org/10.1016/j.jretconser.2019.03.004

Rauschnabel, P. A., He, J., & Ro, Y. S. (2018). Antecedents to the adoption of augmented reality smart glasses: A closer look at privacy risks. Journal of Business Research, 92, 374–384. https://doi.org/10.1016/j.jbusres.2018.08.008

Regenbrecht, H., & Schubert, T. W. (2002). Real and Illusory Interactions Enhance Presence in Virtual Environments. Presence: Teleoperators & Virtual Environments, 11(4), 425–434. https://doi.org/10.1162/105474602760204318

Rese, A., Schreiber, S., & Baier, D. (2014). Technology acceptance modeling of augmented reality at the point of sale: Can surveys be replaced by an analysis of online reviews? Journal of Retailing and Consumer Services, 21(5), 869–876. https://doi.org/10.1016/j.jretconser.2014.02.011

Riva, G and Waterworth, J A (2003). Presence and the Self: a cognitive neuroscience approach. Presence-Connect, 3 (3), posted 07-04-2003.

Sadowski, W., & Stanney, K. (2002). Presence in virtual environments. In K. M. Stanney (Ed.), Handbook of virtual environments: Design, implementation, and applications (pp. 791–806). Lawrence Erlbaum Associates Publishers.

Salo, M. (2013). Sources of Dissatisfaction: Mobile Interaction with the Real World and Other Mobile Internet Applications. Hawaii International Conference on System Sciences. https://doi.org/10.1109/hicss.2013.493

Sanayi ve Teknoloji Bakanlığı (2020) Mobilya Sektörü Raporu, https://www.sanayi.gov.tr/assets/pdf/plan-program/MobilyaSektorRaporu2020.pdf, Last accessed: 15 December 2022

Savalei, V., & Bentler, P. M. (2010). Structural Equation Modeling. The Corsini Encyclopedia of Psychology, 1–3. https://doi.org/10.1002/9780470479216.corpsy0953

Schlackman, W. (1989a) An historical perspective, in Robson, S. & Foster, A. (eds) Qualitative Research in Action. London: Hodder & Stoughton Limited, pp. 58–75.

Schlackman, W. (1989b) Projective tests and enabling techniques for use in market research, in Robson, S. & Foster, A. (eds) Qualitative Research in Action. London: Hodder & Stoughton Ltd, Chapter 6, pp. 58–75

Schloerb, D. W. (1995). A Quantitative Measure of Telepresence. Presence: Teleoperators & Virtual Environments, 4(1), 64–80. https://doi.org/10.1162/pres.1995.4.1.64

Schmitt, B.H. (1999) Experiential Marketing. How to Get Customers to Sense, Feel, Think, Act, Relate to Your Company and Brands. The Free Press, New York.

Scholz, J., & Smith, A. (2016). Augmented reality: Designing immersive experiences that maximize consumer engagement. Business Horizons, 59(2), 149–161. https://doi.org/10.1016/j.bushor.2015.10.003

Schubert, T. W. (2009). A New Conception of Spatial Presence: Once Again, with Feeling. In Communication Theory (Vol. 19, Issue 2, pp. 161–187). Wiley-Blackwell. https://doi.org/10.1111/j.1468-2885.2009.01340.x

Sengupta, A. and Cao, L. (2022), "Augmented reality's perceived immersion effect on the customer shopping process: decision-making quality and privacy concerns", International Journal of Retail & Distribution Management, Vol. 50 No. 8/9, pp. 1039-1061. https://doi.org/10.1108/IJRDM-10-2021-0522

Shepiliev, D. S., Modlo, Y. O., Yechkalo, Y. V., Tkachuk, V. V., Mintii, M. M., Mintii, I. S., Markova, O. M., Selivanova, T. V., Drashko, O., Kalinichenko, O. O., Vakaliuk, T. A., Osadchyi, V., & Semerikov, S. O. (2021). WebAR development tools: An overview. https://doi.org/10.31812/123456789/4356

Sheridan, J.E. (1992) Organizational Culture and Employee Retention. Academy of Management Journal, 35, 1036- 1056. http://dx.doi.org/10.2307/256539

Shin, D. (2017). How does immersion work in augmented reality games? A user-centric view of immersion and engagement. Information, Communication & Society, 22(9), 1212–1229. https://doi.org/10.1080/1369118x.2017.1411519

Slama, M. E., & Tashchian, A. (1987). Validating the S-O-R Paradigm for Consumer Involvement with a Convenience Good. Journal of the Academy of Marketing Science, 15(1), 36–45. https://doi.org/10.1177/009207038701500105

Slater, M., & Wilbur, S. (1997). A Framework for Immersive Virtual Environments (FIVE): Speculations on the Role of Presence in Virtual Environments. Presence: Teleoperators & Virtual Environments, 6(6), 603–616. https://doi.org/10.1162/pres.1997.6.6.603

Smink, A. R., Van Reijmersdal, E. A., Van Noort, G., & Neijens, P. (2020). Shopping in augmented reality: The effects of spatial presence, personalization and intrusiveness on app and brand responses. Journal of Business Research, 118, 474–485. https://doi.org/10.1016/j.jbusres.2020.07.018

Smink, A. R., Van Reijmersdal, E. A., Van Noort, G., & Neijens, P. (2020). Shopping in augmented reality: The effects of spatial presence, personalization and intrusiveness on app and brand responses. Journal of Business Research, 118, 474–485. https://doi.org/10.1016/j.jbusres.2020.07.018

Song, H. S., Baek, E., & Choo, H. J. (2019). Try-on experience with augmented reality comforts your decision. Information Technology & People, 33(4), 1214–1234. https://doi.org/10.1108/itp-02-2019-0092

Spangenberg, E. R., Crowley, A. E., & Henderson, P. W. (1996). Improving the store environment: Do olfactory cues affect evaluations and behaviors? Journal of Marketing, 60(2), 67–80. https://doi.org/10.2307/1251931

Spears, N., & Singh, S. (2004). Measuring Attitude toward the Brand and Purchase Intentions. Journal of Current Issues and Research in Advertising, 26(2), 53–66. https://doi.org/10.1080/10641734.2004.10505164

Spreer, P., & Kallweit, K. (2014). Augmented Reality in Retail: Assessing the Acceptance and Potential for Multimedia Product Presentation at the PoS. SOP

Transactions on Marketing Research, 1(1), 23–31. https://doi.org/10.15764/mr.2014.01002

Statista. (2023, March 29). E-commerce retail sales CAGR 2023-2027, by country. https://www.statista.com/forecasts/220177/b2c-e-commerce-sales-cagr-forecast-for-selected-countries, Last accessed: 21 November 2022.

Steuer, J. (1992). Defining Virtual Reality: Dimensions Determining Telepresence. Journal of Communication, 42(4), 73–93. https://doi.org/10.1111/j.1460-2466.1992.tb00812.x

Stumpp, S., Knopf, T. & Michelis, D. (2019). User Experience Design With Augmented Reality (AR). http://dx.doi.org/10.34190/ECIE.19.019

Suh, K., & Chang, S. (2006). User interfaces and consumer perceptions of online stores: The role of telepresence. Behaviour & Information Technology, 25(2), 99–113. https://doi.org/10.1080/01449290500330398

Sundar, S. S., Jia, H., Waddell, T. K., & Huang, Y. (2015). Toward a Theory of Interactive Media Effects (TIME). The Handbook of the Psychology of Communication Technology, 47–86. https://doi.org/10.1002/9781118426456.ch3

Symonds, P. M. (1924). On the Loss of Reliability in Ratings Due to Coarseness of the Scale. Journal of Experimental Psychology, 7(6), 456–461. https://doi.org/10.1037/h0074469

Türkiye e-ticaret ekosistemi raporu (2021), Iyzico, Dogma alares & elektronik ticaret işletmecileri derneği., https://media.iyzico.com/b/2022/04/DA_iyzico_e-commerce_report_20220414_Bask%C4%B1.pdf, Last accessed: 15 December 2022

Uslu, A., & Uysal, M. (2021). Kitle Kaynaklı Fotoğraflar Kullanılarak Kültürel Mirasın Üç Boyutlu Modellenmesi ve Web Tabanlı Görselleştirilmesi: Afrodisias - Tetrapylon Örneği. Fen Ve Mühendislik Bilimleri Dergisi, 21(3), 632–639. https://doi.org/10.35414/akufemubid.889211

Varnalı, K. 2020. “Mobil Uygulamaların Önlenemez Yükselişi”. Adhoc Dergi https://adhocdergi.com/mobil-uygulamalarin-onlenemez-yukselisi/, Last accessed: 10 August 2022

Vonkeman, C., Verhagen, T., & Van Dolen, W. (2017). Role of local presence in online impulse buying. Information & Management, 54(8), 1038–1048. https://doi.org/10.1016/j.im.2017.02.008

Vorderer, P, Wirth, W., Gouveia, F. R., Biocca, F., Saari, T., Jäncke, F., Böcking, S., Schramm, H., Gysbers, A., Hartmann, T., Klimmt, C., Laarni, J., Ravaja, N., Sacau, A., Baumgartner, T. & Jäncke, P. (2004). MEC Spatial Presence Questionnaire (MEC-SPQ): Short Documentation and Instructions for Application. Report to the European Community, Project Presence: MEC (IST-2001-37661). Online. Available from http://www.ijk.hmt-hannover.de/presence.

Wakefield, K. L., & Blodgett, J. G. (1994). The Importance of Servicescapes in Leisure Service Settings. Journal of Services Marketing, 8(3), 66–76. https://doi.org/10.1108/08876049410065624

Walther, G., Beißner, S., & Burga, C. A. (2005). Trends in the upward shift of alpine plants. Journal of Vegetation Science, 16(5), 541–548. https://doi.org/10.1111/j.1654-1103.2005.tb02394.x

Wang, Y., Ko, E., & Wang, H. (2021). Augmented reality (AR) app use in the beauty product industry and consumer purchase intention. Asia Pacific Journal of Marketing and Logistics, 34(1), 110–131. https://doi.org/10.1108/apjml-11-2019-0684

Wang, Y., Minor, M. S., & Wei, J. (2011). Aesthetics and the online shopping environment: Understanding consumer responses. Journal of Retailing, 87(1), 46–58. https://doi.org/10.1016/j.jretai.2010.09.002

Watson, A., Alexander, B., & Salavati, L. (2018). The impact of experiential augmented reality applications on fashion purchase intention. International Journal of Retail & Distribution Management, 48(5), 433–451. https://doi.org/10.1108/ijrdm-06-2017-0117

Web AR Definition - Augmented Reality Glossary. (n.d.). https://www.ar.rocks/glossary/web-ar, Last accessed: 5 December 2022

Witmer, B.G. and Singer, M.J. (1998) Measuring Presence in Virtual Environments: A Presence Questionnaire. Presence: Teleoperators and Virtual Environments, 7, 225-240. http://dx.doi.org/10.1162/105474698565686

Wong, K. K. 2013. Partial Least Squares Structural Equation Modelling (PLS-SEM) Techniques Using SmartPLS. Marketing Bulletin, 24(1): 1 – 32.

Wu, C., Cheng, F., & Yen, D. C. (2008). The atmospheric factors of online storefront environment design: An empirical experiment in Taiwan. Information & Management, 45(7), 493–498. https://doi.org/10.1016/j.im.2008.07.004

Wu, G. (2005). The Mediating Role of Perceived Interactivity in the Effect of Actual Interactivity on Attitude Toward the Website. Journal of Interactive Advertising, 5(2), 29–39. https://doi.org/10.1080/15252019.2005.10722099

Wu, X., & Lai, I. K. W. (2021). Identifying the response factors in the formation of a sense of presence and a destination image from a 360-degree virtual tour. Journal of Destination Marketing and Management, 21, 100640. https://doi.org/10.1016/j.jdmm.2021.100640

Yadav, M. S., De Valck, K., Hennig-Thurau, T., Hoffman, D. L., & Spann, M. (2013). Social Commerce: A Contingency Framework for Assessing Marketing Potential. Journal of Interactive Marketing, 27(4), 311–323. https://doi.org/10.1016/j.intmar.2013.09.001

Yaoyuneyong, G., Foster, J., Johnson, E. A., & Johnson, D. W. (2016). Augmented Reality Marketing: Consumer Preferences and Attitudes Toward Hypermedia Print Ads. Journal of Interactive Advertising, 16(1), 16–30. https://doi.org/10.1080/15252019.2015.1125316

Yim, M., Chu, S., & Sauer, P. L. (2017b). Is Augmented Reality Technology an Effective Tool for E-commerce? An Interactivity and Vividness Perspective. Journal of Interactive Marketing, 39, 89–103. https://doi.org/10.1016/j.intmar.2017.04.001

Zhang, W., Han, B., & Hui, P. (2017). On the Networking Challenges of Mobile Augmented Reality. https://doi.org/10.1145/3097895.3097900

APPENDIX

Appendix A: ENGLISH QUESTIONNAIRE

Electronic Approval

I understand the intended use of survey and I voluntarily agree to participate.

☐ Yes

☐ No

I am allowing the researcher to use the data obtained from this survey in the mentioned academic research.

☐ Yes

☐ No

I agree that the confidential electronic cells collected in the survey will be recorded in a secure and encrypted database with limited access and run anonymously.

☐ Yes

☐ No

QUESTIONNAIRE

Item Nr.	Please indicate the extent to which you agree with each statement.	1 = Strongly Disagree	2	3	4 = Neutral	5	6	7 = Strongly Agree
1	I was in control of my navigation through the web-based augmented reality technology.	☐	☐	☐	☐	☐	☐	☐
2	I had some control over the content of the augmented reality technology that I wanted to see.	☐	☐	☐	☐	☐	☐	☐

3	The web based augmented reality technology had the ability to respond to my specific needs quickly and efficiently.	☐	☐	☐	☐	☐	☐	☐
4	The visual display through the web-based AR technology was clear.	☐	☐	☐	☐	☐	☐	☐
5	The visual display through the web-based AR technology was detailed.	☐	☐	☐	☐	☐	☐	☐
6	The visual display through the web-based AR technology was vague. *	☐	☐	☐	☐	☐	☐	☐
7	The visual display through the web-based AR technology was vivid.	☐	☐	☐	☐	☐	☐	☐
8	The visual display through the web-based AR technology was well-defined.	☐	☐	☐	☐	☐	☐	☐
9	I felt I could enrich room.	☐	☐	☐	☐	☐	☐	☐
10	After I stopped using the web-based AR, I could still imagine furniture.	☐	☐	☐	☐	☐	☐	☐
11	The virtual furniture seemed completely real.	☐	☐	☐	☐	☐	☐	☐
12	I felt that the virtual furniture did not add anything to room.*	☐	☐	☐	☐	☐	☐	☐
13	Reality seemed richer.	☐	☐	☐	☐	☐	☐	☐
	Please indicate the extent to which you agree with each statement.	**1 = Strongly Disagree**	**2**	**3**	**4 = Neutral**	**5**	**6**	**7 = Strongly Agree**
14	I felt like the furniture was actually there in the real world.	☐	☐	☐	☐	☐	☐	☐
15	It was as though the actual location of the furniture had shifted into the real-world environment.	☐	☐	☐	☐	☐	☐	☐

16	I felt like the furniture meshed with the real-world surroundings.	☐	☐	☐	☐	☐	☐	☐
17	I had the impression that I could interact with virtual furniture in the real world.	☐	☐	☐	☐	☐	☐	☐
18	I felt like I could move the virtual furniture around in the real world.	☐	☐	☐	☐	☐	☐	☐
19	The virtual furniture gave me the feeling I could do things with it.	☐	☐	☐	☐	☐	☐	☐
20	It seemed to me that I could do whatever I wanted with the virtual furniture.	☐	☐	☐	☐	☐	☐	☐
21	I am comfortable with choosing furniture when using web-based augmented reality.	☐	☐	☐	☐	☐	☐	☐
22	I feel good about choosing furniture web-based augmented reality.	☐	☐	☐	☐	☐	☐	☐
23	I am experiencing negative emotions about choosing furniture web-based augmented reality.*	☐	☐	☐	☐	☐	☐	☐
24	I have no issues with furniture selection using web-based augmented reality, whether it's the "best" choice or not.	☐	☐	☐	☐	☐	☐	☐
25	Although I don't know if the furniture is the best, I feel perfectly comfortable with my choices when using web-based augmented reality.	☐	☐	☐	☐	☐	☐	☐
	Please indicate the extent to which you agree with each statement.	**1 = Strongly Disagree**	**2**	**3**	**4 = Neutral**	**5**	**6**	**7 = Strongly Agree**
26	I tend to buy furniture using web-based augmented reality in the future.	☐	☐	☐	☐	☐	☐	☐
27	Web-based augmented reality technology can convince me about the product I want to buy.	☐	☐	☐	☐	☐	☐	☐

28	If I were to buy furniture, I would probably choose a product from a company that uses web-based augmented reality technology.	☐	☐	☐	☐	☐	☐	☐

* = Reverse Questions

Personal Information

29. Gender

- Male
- Female
- Other

30. Age:

- 18-25
- 26-30
- 31-35
- 35-40
- 41-45
- 46+

31. Education Level:

- High School Level
- Undergraduate student
- Undergraduate graduated
- Master's student
- Master's graduate
- PhD student
- PhD graduate

32. Where do you reside?

- Student
- Private Sector Employee
- Public Officer
- Homemaker
- Self-employment
- Other

33. I find the use of augmented reality technologies in e-commerce helpful.

1= Strongly Disagree	2	3	4 = Neutral	5	6	7 = Strongly Agree
☐	☐	☐	☐	☐	☐	☐

34. Have you ever used augmented reality before taking this questionnaire?

- Yes
- No
- I don't remember

35. Have you ever purchased a product or service using augmented reality?

- Yes
- No
- I don't remember

End of the survey
Thanks for your participation

Appendix B: TURKISH QUESTIONNAIRE

Elektronik Onay

Anketin kullanım amacını anlıyorum ve gönüllü olarak katılmayı kabul ediyorum.

☐ Evet

☐ Hayır

Araştırmacının bu anketten elde ettiği verileri söz konusu akademik araştırmada kullanmasına izin veriyorum.

☐ Evet

☐ Hayır

Ankette toplanan gizli elektronik verilerin sınırlı erişime sahip güvenli ve şifreli bir veri tabanına kaydedileceğini ve anonim olarak çalıştırılacağını kabul ediyorum.

☐ Evet

☐ Hayır

ANKET

Soru No.	**Lütfen her bir ifadeye ne ölçüde katıldığınızı belirtiniz.**	**1= Kesinlikle Katılmıyorum**	**2**	**3**	**4 = Tarafsız**	**5**	**6**	**7 = Kesinlikle Katılıyorum**
1	Web tabanlı artırılmış gerçeklik teknolojisi aracılığıyla yönümü bulma kontrolü bendeydi.	☐	☐	☐	☐	☐	☐	☐
2	Görmek istediğim artırılmış gerçeklik teknolojisinin içeriği üzerinde biraz kontrolüm vardı.	☐	☐	☐	☐	☐	☐	☐
3	Web tabanlı artırılmış gerçeklik teknolojisi, özel ihtiyaçlarıma hızlı ve verimli bir şekilde yanıt verme yeteneğine sahipti.	☐	☐	☐	☐	☐	☐	☐
4	Web tabanlı artırılmış gerçeklik teknolojisi aracılığıyla sunulan görsel ekran netti.	☐	☐	☐	☐	☐	☐	☐
5	Web tabanlı artırılmış gerçeklik teknolojisi aracılığıyla sunulan görsel ekran detaylıydı.	☐	☐	☐	☐	☐	☐	☐

6	Web tabanlı artırılmış gerçeklik teknolojisi aracılığıyla sunulan görsel ekran belirsizdi.*	☐	☐	☐	☐	☐	☐	☐
7	Web tabanlı artırılmış gerçeklik teknolojisi aracılığıyla sunulan görsel ekran canlıydı.	☐	☐	☐	☐	☐	☐	☐
8	Web tabanlı artırılmış gerçeklik teknolojisi aracılığıyla sunulan görsel ekran iyi tanımlanmıştı.	☐	☐	☐	☐	☐	☐	☐
9	Odayı zenginleştirebileceğimi hissettim.	☐	☐	☐	☐	☐	☐	☐
10	Web tabanlı artırılmış gerçeklik teknolojisini kullanmayı bıraktıktan sonra da mobilyayı hayal edebiliyordum.	☐	☐	☐	☐	☐	☐	☐
11	Sanal mobilyalar tamamen gerçek gibiydi.	☐	☐	☐	☐	☐	☐	☐
12	Sanal mobilyaların odaya bir katkı sağlamadığını hissettim.*	☐	☐	☐	☐	☐	☐	☐
13	Gerçeklik daha zengin görünüyordu.	☐	☐	☐	☐	☐	☐	☐
	Lütfen her bir ifadeye ne ölçüde katıldığınızı belirtiniz.	**1= Kesinlikle Katılmıyoru**	**2**	**3**	**4 = Tarafsız**	**5**	**6**	**7 = Kesinlikle Katılıyorum**
14	Sanal mobilyanın gerçek dünyada gerçekten orada olduğunu hissettim.	☐	☐	☐	☐	☐	☐	☐
15	Sanki sanal mobilyanın asıl konumu gerçek dünya ortamına kaymış gibiydi.	☐	☐	☐	☐	☐	☐	☐
16	Sanal mobilyanın gerçek dünya ortamıyla uyum sağladığını hissettim.	☐	☐	☐	☐	☐	☐	☐
17	Gerçek dünyada sanal mobilya ile etkileşim kurabileceğim izlenimine kapıldım.	☐	☐	☐	☐	☐	☐	☐
18	Sanal mobilyayı gerçek dünyada hareket ettirebileceğimi hissettim.	☐	☐	☐	☐	☐	☐	☐
19	Sanal mobilya bana onunla bir şeyler yapabileceğim hissini verdi.	☐	☐	☐	☐	☐	☐	☐

20	Bana öyle geliyordu ki sanal mobilya ile istediğim her şeyi yapabilirdim.	☐	☐	☐	☐	☐	☐	☐
21	Web tabanlı artırılmış gerçeklik kullanırken mobilya seçimi konusunda rahatım.	☐	☐	☐	☐	☐	☐	☐
22	Web tabanlı artırılmış gerçeklik kullanırken mobilya seçimi konusunda kendimi iyi hissediyorum.	☐	☐	☐	☐	☐	☐	☐
23	Web tabanlı artırılmış gerçeklik kullanırken mobilya seçimi konusunda olumsuz duygular yaşıyorum.*	☐	☐	☐	☐	☐	☐	☐
24	Web tabanlı artırılmış gerçeklik kullanırken "en iyi seçim" olsun ya da olmasın, mobilya seçiminde sorun yaşamıyorum.	☐	☐	☐	☐	☐	☐	☐
25	Web tabanlı artırılmış gerçeklik kullanırken mobilyaların en iyisi olup olmadığını bilmesem de, seçimlerim konusunda kendimi son derece rahat hissediyorum.	☐	☐	☐	☐	☐	☐	☐
	Lütfen her bir ifadeye ne ölçüde katıldığınızı belirtiniz.	**1= Kesinlikle Katılmıyorum**	**2**	**3**	**4 = Tarafsız**	**5**	**6**	**7 = Kesinlikle Katılıyorum**
26	Gelecekte web tabanlı artırılmış gerçeklik kullanarak mobilya satın alma eğilimindeyim.	☐	☐	☐	☐	☐	☐	☐
27	Web tabanlı artırılmış gerçeklik teknolojisi satın almak istediğim ürün konusunda beni ikna edebilir.	☐	☐	☐	☐	☐	☐	☐
28	Eğer mobilya satın alacak olsaydım muhtemelen web tabanlı artırılmış gerçeklik teknolojisi kullanan bir şirketin ürününü seçerdim.	☐	☐	☐	☐	☐	☐	☐

* = Tersine Sorular

Kişisel Bilgiler

29. Cinsiyetiniz:
    - Kadın
    - Erkek
    - Diğer
30. Yaşınız:
    - 18-25
    - 26-30
    - 31-35
    - 36-40
    - 41-45
    - 46+
31. Eğitim Düzeyi:
    - Lise Düzeyi
    - Lisans Öğrencisi
    - Lisans Mezunu
    - Yüksek Lisans Öğrencisi
    - Yüksek Lisans Mezunu
    - Doktora Öğrencisi
    - Doktora Mezunu
32. Mesleğiniz
    - Öğrenci
    - Özel Sektör Çalışanı
    - Kamu Görevlisi
    - Ev Hanımı
    - Serbest Meslek
    - Diğer

33. Artırılmış gerçeklik teknolojilerinin e-ticarette kullanılmasını faydalı buluyorum.

1= Kesinlikle Katılmıyorum	2	3	4 = Tarafsız	5	6	7 = Kesinlikle Katılıyorum
☐	☐	☐	☐	☐	☐	☐

34. Bu ankete katılmadan önce hiç artırılmış gerçeklik kullandınız mı?

☐ Evet

☐ Hayır

☐ Hatırlamıyorum

35. Daha önce artırılmış gerçeklik kullanarak bir ürün ya da hizmet satın aldınız mı?

☐ Evet

☐ Hayır

☐ Hatırlamıyorum

Anketin sonu

Katılımınız için teşekkür ederiz.

Appendix C: ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 23.06.2023-68032

T.C.
TÜRK-ALMAN ÜNİVERSİTESİ REKTÖRLÜĞÜNE

06.06.2023

26.05.2023 tarih ve E-19291041-044-67069 sayılı Ferhat SAYIN tarafından yapılacak "E-ticarette arttırılmış gerçeklik- S-O-R modeli temelinde web tabanlı arttırılmış gerçeklik teknolojisinin mobilya perakendeciliği üzerindeki etkisinin değerlendirilmesi" isimli araştırma, Üniversitemiz Bilimsel Araştırma ve Yayın Etiği kurulunca incelenerek aşağıda belirtilen şartları sağlamak koşuluyla uygun bulunmuştur.

- Çalışma katılımcı profiline uygun kişiler ile sınırlı olarak gerçekleştirilecektir.
- Çalışmada kapsamında anket yapılacak ve veri toplanacaktır.
- Katılımcılar çalışmanın kapsamı ve amacı noktasında bilgilendirilecektir.
- Katılımcıların verilerinin işlenmesi ve anonim olarak kullanılması bakımından yasal düzenlemeler uyarınca rızalarının alınması gerekmektedir.
- Çalışma kapsamında tıbbi ve hukuki sorumluluk çalışmayı yürütenlere aittir.
- Çalışma kapsamında gerçekleştirilecek her türlü değişikliğin Bilimsel Araştırma ve Yayın Etiği kuruluna bildirilmesi gerekmektedir.

Çalışmanın yürütülmesi bakımından başvurucuya başarılar dileriz.

Bilimsel Araştırma ve Etik Kurulu
Prof. Dr. Ali Kemal YILDIZ

CURRICULUM VITAE

Ferhat Sayın graduated from the Turkish German University, Department of German Business Administration, in 2019. He has been working as a research assistant in the marketing department of Business Administration at the German-Turkish University since March 2022.