Check for updates

Original Research

SAGE Open
July-September 2024: 1–22
© The Author(s) 2024
DOI: 10.1177/21582440241284589
journals.sagepub.com/home/sgo
Sage

Development, Reliability, and Validity of the Influences of Digital Technologies on Human Behavior in Public Space Scale Tested by Spatial Design Experts

Aslı Altanlar[1], Esin Özlem Aktuğlu Aktan[2], and İbrahim Eren[2]

Abstract

The widespread use of digital technologies and online social networks causes a shift that has a pronounced impact on public space, public life, and public space design. However, research into this transformation is quite constrained. This study aims to illuminate how digital technologies influence individuals and their behavior in public spaces. A comprehensive conceptual scale was developed in the study to assess the impact of digital technology use on human behavior in public spaces. A structural equation model (SEM) was proposed after testing the scale's construct validity. According to the findings, the factors influencing the scale were social isolation (F1), media influence (F2), placelessness and/or homogeneity (F3), techno-stress-related social anxiety (F4), and digital addiction (F5). The SEM (Structural Equation Modeling) results demonstrated strong relationships among these factors, with digital addiction significantly predicting social isolation ($\beta = .90$; $p < .01$) and placelessness ($\beta = .74$; $p < .01$). The media influence factor had the most substantial effect on techno-stress-related social anxiety. This study contributes significantly to the literature by understanding the influences of digital technologies on public life and adapting public space design to this new reality. The findings also guide prospective studies into the effects of digital technologies in public spaces, offering valuable insights for urban planning, social psychology, architecture, and social sciences research.

Plain language summary

How digital technologies affect human behavior in public spaces: A study by spatial design experts

Digital technologies and social networks are changing how people use public spaces and how these spaces are designed. Despite this, there has been limited research on this topic. This study explores how digital technologies influence people's behavior in public areas. Researchers developed a detailed scale to measure this impact and tested its accuracy using a structural equation model (SEM). The study identified five key factors: social isolation, media influence, placelessness or sameness, social anxiety from techno-stress, and digital addiction. The results showed strong connections between these factors, with digital addiction leading to higher social isolation and placelessness. Media influence was the biggest cause of social anxiety from techno-stress. This study provides valuable insights into how digital technologies affect public life and offers guidance for future research in urban planning, social psychology, architecture, and social sciences.

Keywords

public life, online social networks, human behavior, social isolation, technological anxiety, digitization and urban life

[1]University of Amasya, Amasya, Türkiye
[2]Yildiz Technical University, Istanbul, Türkiye

Corresponding Author:
Esin Özlem Aktuğlu Aktan, Faculty of Architecture, City and Regional Planning Department, Yildiz Technical University, Beşiktaş, Istanbul 34349, Türkiye.
Email: esinaktan@hotmail.com

Creative Commons CC BY: This article is distributed under the terms of the Creative Commons Attribution 4.0 License (https://creativecommons.org/licenses/by/4.0/) which permits any use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).

Introduction

Transformations triggered by technological advancements shape world history. This new revolution aims to create high-tech industrial processes while considering how new technologies can improve and enhance people's lives and bodies. These digital technological advancements, realized within the framework of these goals, force a digital transformation in almost every aspect of life, significantly impacting human life and people's interactions (Ellen Frederick, 2016). In other words, digital technologies have substantially altered how people communicate and interact with their surroundings. Individual devices and technological innovations such as mobile phones, personal computers, driverless vehicles, drones, advanced television units, wearable devices, smartphones, and smartwatches have transformed how societies access information (Büyüközkan & Göçer, 2018). Just as new technologies affect every sector, they also affect the usage preferences of individuals, institutions, and business areas, all of which are elements of urban life in urban spaces (Nasiri et al., 2020).

As the use of digital networks becomes ubiquitous, a new digital layer is being added to the existing urban landscape (Badel & Lopez Baeza, 2021). Statista (2024) states that as of April 2024, approximately 67% of the world's population are internet users, and around 63% are social media users. In other words, these anticipated outcomes in digital technologies have already begun to generate radical changes in almost every aspect of everyday life by altering individuals' daily lives, working styles, habits, and value judgments. These changes influence people's lives and societies, shaping how they communicate and interact with their physical and urban environments (ATDE, 2015). For instance, the fact that people have agreed to participate in various digital art exhibitions in public spaces in recent years may indicate a shift in their preferences for using public space. The presence of data walls and digital signage in public spaces, digital games, and the performance of digital folk arts have begun to update the appearance and sense of space in many public spaces. Nowadays, communication does not have to come about in the same place or at the same time. The possibility of socializing via digital social media and messaging platforms has eliminated the requirement for using physical space, face-to-face interaction, and direct synchronous communication. As a result, people can communicate with each other regardless of their physical location. One of the primary goals of public spaces is to increase social interaction among people, exerting a direct influence on their quality. However, digitization of public spaces extends beyond free internet in parks, squares, and other urban spaces (Badel & Lopez Baeza, 2021). There are opinions that if public spaces suitable for the digital age that meet the needs of citizens cannot be established in future cities, the interaction of individuals in public spaces will decrease and they may face social and psychological problems such as social isolation, placelessness, (Castells, 2010; Liu & Freestone, 2016; Montague, 2016), homogenization (Castells, 2010) technological anxiety (Turkle, 2011), and erosion of the social culture of the society (Farahdina et al., 2020). However, in addition to issues such as when we use digital or physical spaces for socialization, that is, motivations, external conditions, necessities, objectives, studies on the transformations in individuals' behaviors and attitudes toward public space usage with the development of digital technologies and their social and psychological consequences on social life are not adequate. Several studies have been conducted in the last decade to investigate the relationships between the use of social media, online social networks, and mobile technologies and life satisfaction (Kross et al., 2013), mental health (Zhang et al., 2020), social isolation (Kusumota et al., 2022; Primack et al., 2017), loneliness (Yang et al., 2020; Zhang et al., 2020), social anxiety (O'Day & Heimberg, 2021; Shaw et al., 2015), and depression (Tandoc et al., 2015; Wright et al., 2013). Despite this, research on how digital technologies and social media use influence public space, public life, and public space design, as well as how designers can react to these challenges, is limited (Badel & Lopez Baeza, 2021; Farahdina et al., 2020; Vazquez et al., 2023).

Discussing the acceleration and technology-induced paradigm shift brought about by the information age in the public space is crucial. In this era of rapid and profound technological change understanding how digital technologies impact society is paramount. Previous studies, particularly in the social sciences, have primarily focused on public life but have found relatively few investigations into how digital technologies influence human behavior in public spaces. The theoretical foundation of this study draws from Castells (2010) theory of the network society, focusing on Lefebvre (1991), Bauman's (2013), and Baudrillard's (1981/1994) emphasis on alienation, alongside Turkle's theory of the age of loneliness. The study aims to analyze the effects of digital technologies on human interactions and behaviors, employing a scale designed to fill gaps in existing literature and contribute to its advancement. Based on this premise, the study aims to illuminate how digital technologies influence individuals and their behavior in public spaces. Accordingly, it was designed to develop a scale based on empirical data, addressing this gap and contributing to the field. Given its perspective from spatial science, the study focused on spatial design experts and urban residents (users of public spaces). To achieve this goal, the research addresses the following questions: (1) What are the characteristics of social impact, social isolation,

technological anxiety, media, and digitalization effects that influence human behavior in the context of digital technologies in public spaces? Is the level of relationship between these factors sufficient? (2) Is the proposed scale structurally valid? (3) What are the significant effects of media and digital technology addiction on social isolation, homogeneity, placelessness, and social anxiety? How do these effects differ? The study presents five hypotheses:

H1: Individuals' behaviors and attitudes in public spaces are determined by media, digital technologies, technology-induced anxiety, social isolation, and social influences.
H2: Digital addiction increases social isolation, homogenization and/or placelessness, and social anxiety.
H3: Media increases social isolation, homogenization and/or placelessness, and social anxiety.
H4: Technological anxiety mediates the relationship between digital technology use and social isolation in public spaces.
H5: There is a significant relationship between social isolation and digital addiction.

The first step of the study was to employ the scale to urban planners, architects, landscape architects, and urban designers actively engaged in urban space design to obtain answers to the research questions. Second, the survey was conducted among Istanbul residents to confirm the structural validity of the scale.

The first section of the study briefly discusses the significance of digital technologies. The second section presents the theoretical framework for developing a conceptual model for measuring the impact of digital technology use on human behavior in urban settings. The third chapter discusses the research methodology, which includes sampling, data collection, statistical methods for data analysis, validity, reliability, and the study's findings. Finally, the study discusses the theoretical background and presents its findings. As a result, this research demonstrates the structural validity of the proposed scale and how scale factors influence each other to illustrate the effects of digital technology use on social, psychological, and public space dynamics.

Influences of Digital Technologies on Social Life and Public Space

Throughout history, public spaces have evolved and existed to the needs of society and the era. Moughtin (2003) defines public spaces as communication channels that connect different parts of the city and satisfy people's everyday essentials. According to Madanipour (2003), these places indicate the complexity of urban civilization. Considering these criteria, public spaces are, available to all city users, are offered to users, and allow for establishing a common social space (Erdönmez & Çelik, 2016). Eren et al. (2024) emphasize that public space is a phenomenon that continually reproduces itself through experiential interaction with its dynamic and versatile structure. Because of their structure, public spaces have undergone many changes over the centuries. Public space's scope, quality, and usage characteristics have changed dramatically since the second half of the 20th century. Technological and social change accelerated markedly in the 18th and 19th centuries, particularly during the Industrial Revolution (Castells, 2010). With the rapid development of technology, new concepts and discussions have emerged in interpersonal relationships. Sennett (2018) addresses the diminishing physical contact and togetherness in human relationships, interpreting this as a decrease in shoulder-to-shoulder interactions. Bauman (2013) highlights individualization and the community of individuals, emphasizing the main thrust of the era and development. Lefebvre (1991), who also examines everyday relationships in detail, discusses the evolution of space as a social product, and the author (2010) critically addresses the topic through the lens of changing leisure activities, emphasizing the increasing alienation due to the era's demands. On one side, society has confronted the network society developing with new settings, and on the other hand, it has evolved with new phenomena through network society and the latest phase of globalization These developments have brought the issues of individualization, alienation, and loneliness in human relationships to the fore. Levin and Mamlok (2021) consider the digital revolution a cultural phenomenon, viewing individualization developed through the digital revolution as a phenomenon that enhances unique and spiritual cultures in the digital world. They express that this reflects the social culture of the digital society. Turkle (2011), addressing this process with the "alone together" approach, focuses on the community of individuals and the developing phenomenon of loneliness due to the digital revolution, supporting the perspectives of Bauman and Lefebvre.

Eren and Aktuğlu Aktan (2023) point out the critical junctures in public life, indicating that with the rapid technological developments, a new phase in everyday relationships in the public sphere began in the early 1990s. They identify that globally influential events also impacted public life, particularly emphasizing the conflict and tension between capitalism and socialism, the fall of the Berlin Wall in 1989, and the shaping of a new phase of the Cold War. Eren and Aktuğlu Aktan (2023) also mention that this period triggered revolutionary events in communication and information technologies and a new phase of globalization.

With these societal and technological changes and advancements, digital technology has opened the doors to a new era. One of the notable names in the field, Castells (1999) stressed in the 1990s that the entire globe was organized around telecommunications computer networks. Digital technologies have played a crucial role in increasing the speed and scope of social communication (Ray, 2007). Given the evolution of information and communication technologies, speed has become the dominant value for all economic and life contexts. It has substantially accelerated daily life patterns, consequently aggravating alienation from everyday reality due to increased individual mental processes and decreased awareness (Aldinhas Ferreira, 2022). Gökgür (2017) states that these developments in communication, transportation, and information technologies also force changes in urban areas and can reduce the relationship between the individual and the space. Furthermore, such developments have always existed in modern society and have altered how individuals interact with each other.

In particular, the use of online social platforms enables individuals to communicate with their friends, connect with other people based on their hobbies, follow cultural and artistic activities, search for romantic partners, access new information, express their feelings, thoughts, and identity, and share good and bad news. It might propose the opportunity to always communicate with individuals (O'Day & Heimberg, 2021). In other words, the immediate increase in the usage of online social networks and portable mobile devices in modern life has also altered the form of social interaction in urban life. This rapid shift in urban lives has damaged the culture of social interaction and pushed the addition of a new digital layer to urban areas (Badel & Lopez Baeza, 2021). While technology, on the one hand, affects the relationship between individuals and individuals in the public space, on the other hand, it can assemble tools that help solve problems that arise in the public space. According to Lobo (2021), technology is a process that alters how people experience the world and live, in addition to making their surroundings more practical and effective. Digital technology thus evolves a flexible factor that has an impact on urban planning and urban life. Public spaces where society can coexist have also been impacted by the proliferation of digital technologies, which have transformed how people interact. According to Sennett (1994), there is a transition in human relations from contact to alienation because of this accelerated process. While Bauman (2013) discussed individualization and developing situations of ambivalence, Lefebvre (2010) frequently conferred alienation by focusing on changes in leisure necessities and public space use.

The Components of the Impact of Digital Technologies on Human Relationships and Behavior

Considering the increased use of digital technology on individuals and society, the early 2000s explosion of digital technology and media use can negatively affect individuals, such as people becoming more concerned with themselves and interacting less with real people. This situation may also decrease empathy (Konrath et al., 2011). Some notable theorists, such as Turkle (2011), argue that mobile communication technologies, while sometimes facilitating communication, harm interpersonal relationships. Moreover, Turkle (2011) frequently stresses the decline in social interaction and friendship, citing increased feelings of isolation and anxiety. She also claims that it creates a paradoxical situation in which one discerns both more connected and more alone. According to Przybylski and Weinstein (2013), mobile communication devices such as phones have the potential to both facilitate and disrupt human relationships and intimacy. Chayko (2020) also highlights the constant state of connectivity and discusses some potential adverse impacts of technology on society, such as loss of privacy and blurring of work and private life boundaries.

Placelessness has become prevalent as time and technology progress (Castells, 2010; Liu & Freestone, 2016; Montague, 2016). Digital technologies, as understood from the literature, can positively and negatively affect life. It has been claimed that the adverse consequences, once considered from various angles, have varying effects on social structure and human behavior. The literature review has revealed that "placelessness" in the context of digital technology refers to the sensation of being cut off from physical space and may result from an increase in the use of digital technologies in everyday activities, such as spending more time online and having less need to visit physical businesses and places of employment. Digital technologies standardize cultural experiences through a process known as homogenization or identification. Loss of diversity and regional identity may result (Castells, 2010). Technology and internet addiction are other terms for "digital addiction." It is characterized by the person's inability to restrict, regulate, or control their use of digital technology and can be categorized as a type of behavioral addiction. It may impact everyday focus, interpersonal connections, and social interaction (William & White, 2020). The subfactors of placelessness, homogenization, and digital addiction obtained from the literature review are discussed under the social effects group.

Social isolation is a lack of social belonging, genuine interaction with other people, and satisfying relationships (Primack et al., 2017). However, the concept is considered in a dual framework: Objective and subjective social isolation. While objective one refers to a lack of

social relations, biased social isolation refers to a shortage of interaction with other individuals. This condition is related but not identical to aspects of social isolation: a person can be objectively isolated but not lonely, and an individual can be objectively bonded to other people yet still feel lonesome (Primack et al., 2017). As a result, this research concentrates on subjective social isolation. Perceived social isolation—with these features—can be classified as alienation, isolation, or individualization/loneliness. Alienation is the experience of feeling alienated on account of the use of digital technologies to replace face-to-face association. As a result, you may experience sentiments of loneliness or social isolation (Lefebvre, 1991; Turkle, 2011). Isolation and individualization relate to how digital technologies drive people to retreat into their individualized worlds rather than communicate with others in shared environments. This might lead to a loss of social cohesion and a decrease in community associations (Bauman, 2013; Putnam, 2000). Additionally, social isolation is associated with abnormal increases in cortisol levels, and these abnormal conditions can also disrupt sleeping habits, immune function, and cognitive abilities (Primack et al., 2017).

Technostress refers to the adverse psychological and physiological effects of using digital technologies. Because of the excessive use of technology is associated with negative consequences such as reduced job satisfaction, increased workload, and home-work conflicts (Tarafdar et al., 2013). Once examined concerning digital technologies such as online communication or social media, social anxiety refers to the fear and discomfort that may arise from the social interactions they mediate. It can lead to avoidance behaviors and decreased social skills (Turkle, 2011). Digital hyperconnectivity, a relatively new phenomenon, refers to the digital connectivity of the internet. It reorganizes social interaction in the same way that television changes everyday experience. Digital hyperconnectivity has restructured the self, dispositions, and the individual's existence on Earth (Brubaker, 2023). It also means that everyone can connect to everyone and everything digitally (Brubaker, 2020). Fear of Missing Out can be expressed as the desire to maintain continual awareness of the actions of others, the fear of missing out on something via social media, or the fear of missing out on what others are doing (Przybylski et al., 2013). The concepts of technostress, social anxiety, hyperconnectivity, and fear of missing out (FOMO) identified in the literature review are grouped under the title of technological anxiety.

While investigating the effects of digital technologies, some concepts have been frequently encountered recently. Echo Chambers refers to a situation in the social networking system where people are surrounded only by like-minded people (Al Atiqi et al., 2020). The echo chamber metaphor describes how information is amplified and echoed through the media of ideas and has the prospect of reinforcing and insulating conveyed messages from refutation (Jamieson & Cappella, 2010). Filter bubbles are the effects of digital technologies amplifying certain types of content or information, resulting in a distorted view of reality. The filter bubble is structured so that it tends to increase confirmation bias. It enables individuals to consume information corresponding to their worldviews, providing an information environment based on click signals and support for the user's worldviews. Personal interests guide users' decisions (Pariser, 2011). The concepts of echo chambers and filter bubbles regarding the effects of digital technology have been encountered in the literature, and these concepts are grouped under the heading of media effects.

Another issue encountered with the widespread use of digital technology is the differentiation in behavior in the virtual environment. Disinhibition is the term used to describe how using digital technologies can compel individuals to act more impulsively, aggressively, or self-disclosively than they would in face-to-face interactions. This might result in social repercussions like cyberbullying or online harassment (Suler, 2004). This circumstance can be described as the individuals portraying online behaviors that they would not typically display. According to the theory behind technological determinism, technological advancements lead to significant macro-changes in society and history. It also contends that regular use of specific tools has profound microsocial and micro-psychological effects (Technological Determinism, 2011). It has been observed that disinhibition and technological determinism are under the influence of digital technologies, and these are grouped under the title of digital influences.

The opinions and approaches of numerous authors were examined as a result of a comprehensive and systematic literature review. Concepts that demonstrate how digital technology affects interpersonal relationships have been identified. Figure 1 illustrates the categorization of semantically interconnected thoughts. It has been determined that this study, examining the aspects that determine how technologies affect human behavior, can concentrate on five primary issues: media effects, digital effects, social impact, social isolation, and social anxiety caused by technology (Figure 1).

Methodology

Sample Selection and Method

Surveys were administered to two different groups. The first group focused on spatial designers. The second group focuses on urban residents. The reason for focusing primarily on spatial designers as samples in the scale

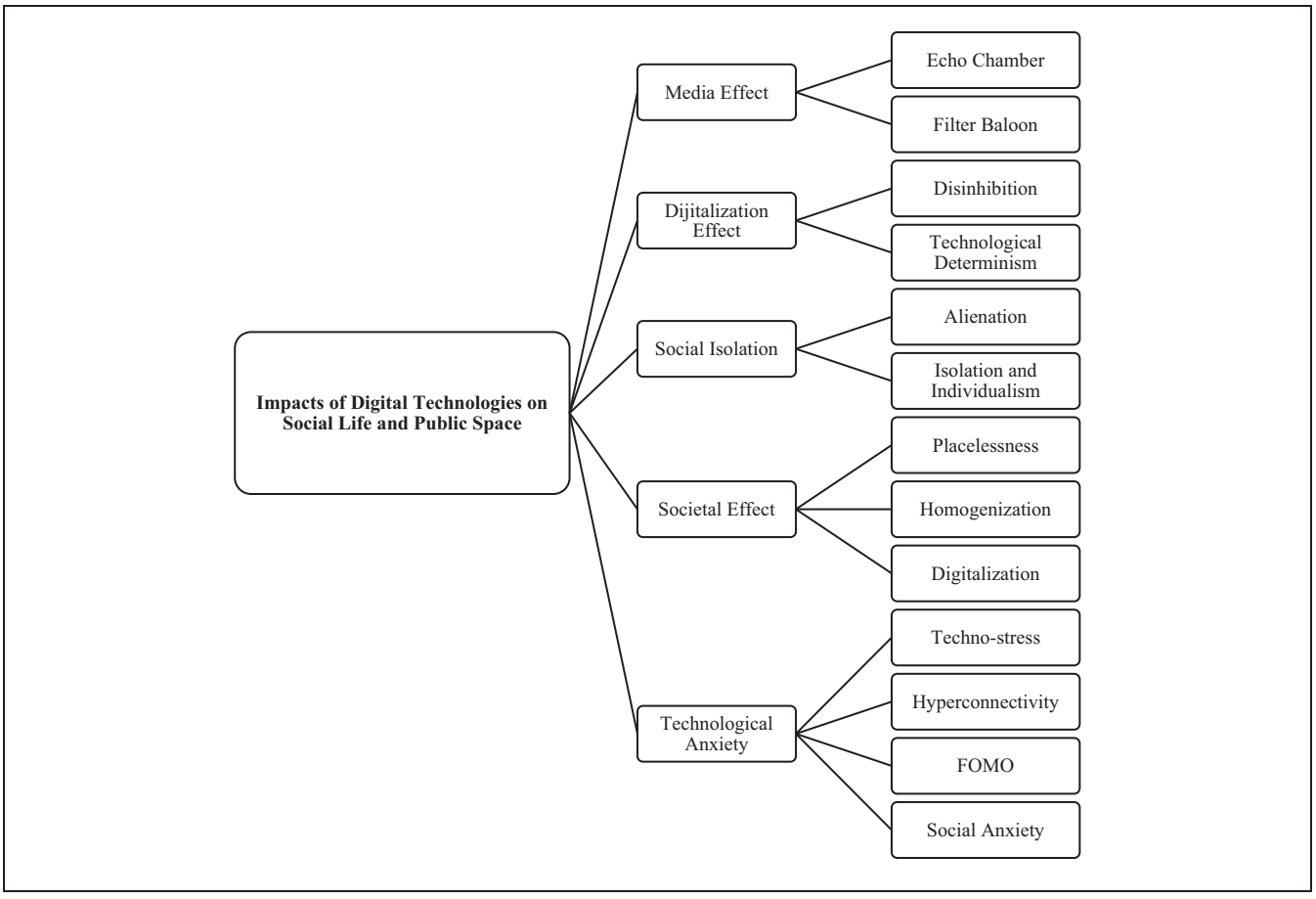

Figure 1. Conceptual model (developed by authors.).

development study is that spatial designers aim to create more livable, sustainable, and esthetically pleasing urban spaces by planning, developing, and protecting the physical, esthetic, and functional structure of cities. Secondly, it was decided to survey city residents living in Istanbul as they are also the users of these urban spaces. Reasons for choosing urban residents living in Istanbul as the study area, according to the 2022 data of the Household Information Technologies (IT) Usage Survey prepared by the Turkish Statistical Institute, 98.7% of the households living in Istanbul have internet access, and with this feature, it ranks first in Turkey; developed internet infrastructure that includes a wide range of communication tools; it is the ability to quickly observe the changes brought about by the developments in information and communication technologies in social life and their effects on the public space. In this study, the sample comprised spatial design experts.

According to 2023 data, there are 85,876 member architects in the Union of Chambers of Turkish Engineers and Architects (TMMOB) Chamber of Architects, 7,044-member urban planners in the Chamber of Urban Planners, and 8,746-member landscape architects in the Chamber of Landscape Architects. With a 95% confidence interval and a 0.05 margin of sampling error, the survey required 384 samples from a pool of 101,666 individuals. The designated survey form was employed using an online survey methodology conducted between May 16th and July 24th, 2023. As can be seen, there are various techniques for determining sample size in the literature. For Pearson Correlation analysis, for example, it is stated that an absolute minimum of 200 samples is necessary (Guilford, 1954 as referenced in Memon et al., 2020). The sample-to-item ratio is commonly employed in exploratory factor analysis (Memon et al., 2020). It is recommended that this ratio not be less than 5 (Gorsuch, 1983; Hatcher, 1994; Memon et al., 2020; Suhr, 2006). For instance, for the 44 items utilized in this study, at least 220 responders are necessary. In addition, it is stated in the literature that for confirmatory factor analysis, the sample group should be at least 300 in cases where normal distribution is not provided and there are missing data (Muthen and Muthen, 2002 as cited in Demir, 2022). The survey for the expert group was conducted with 356 participants (Tables 1–3). Istanbul residents aged 18 and over participated in the

Table 1. Descriptive Statistics on Participants' Age, Gender, and Marital Status.

Spatial designers				Istanbul residents			
		Frequency	Percent			Frequency	Percent
Age	18–24 years old	50	14.0	Age	18–24 years old	69	17.25
	25–34 years old	160	44.9		25–34 years old	88	22.00
	35–44 years old	89	25.0		35–44 years old	96	24.00
	45–54 years old	35	9.8		45–54 years old	80	20.00
	55–64 years old	17	4.8		55–64 years old	67	16.75
	65 years and older	5	1.4		65 years and older	0	0.00
	Total	356	100.0		Total	400	100.00
		Frequency	Percent			Frequency	Percent
Gender	Male	88	24.7	Gender	Male	199	49.75
	Female	268	75.3		Female	201	50.25
	Total	356	100.0		Total	400	100.00
		Frequency	Percent			Frequency	Percent
Marital Status	Married	157	44.1	Marital Status	Married	252	63.00
	Single	253	51.4		Single	131	32.75
	Widowed/Divorced	16	4.5		Widowed/Divorced	17	4.25
	Total	356	100.0		Total	400	100.00

second field study. A sample of 400 individuals was included, representing 1,695,879 individuals with a 95% confidence interval and a sampling error of ± 0.05. This number is a large enough sample size to apply confirmatory factor analysis. The research was conducted between September 15th and November 10th using the computer-assisted telephone survey method (CATI; Tables 1–3).

Survey Form and Content

There are two parts to the survey questions. In the first section, 12 questions are directed to determine the participants' socio-demographic characteristics. The second part of the survey employed a 44-item structure designed to assess the impact of digital technologies on human behavior in public. The scale's components are as follows: Societal effects (11 items; Castells, 2010; Liu & Freestone, 2016; Montague, 2016), social isolation (10 items; Bauman, 2008; Lefebvre, 1991; Putnam, 2000; Turkle, 2011), technological anxiety (10 items; Brubaker, 2023; Przybylski et al., 2013; Tarafdar et al., 2013; Turkle, 2011), media and digital effects (14 items); Al Atiqi et al., 2020; Jamieson & Cappella, 2010; Pariser, 2011; Suler, 2004; Technological Determinism, 2011; William & White, 2020). The scale's statements were evaluated using a 5-point Likert scale (1: strongly disagree −5: strongly agree). Experts reviewed the scale's content validity in terms of language, understandability, and criteria for whether the structure to be measured was accurately depicted or not. Each item received feedback on whether it was necessary. Before releasing the final version of the scale, a group of 15 people, three from the field of measurement and evaluation, two from the field of grammar, and ten from field experts, have supplied remarks on the scale items. After assessing the feedback, the items underwent revision, forming a preliminary questionnaire including 44 distinct components.

Measuring Method

In the first stage, "Exploratory Factor Analysis (EFA)" was utilized to determine the construct validity of the scale made to reveal the factors that determine the impact of digital technology use on human behavior in urban life. Initially, data from spatial design experts were analyzed using Exploratory Factor Analysis (EFA). Subsequently, Confirmatory Factor Analysis (CFA) was conducted on data from urban users to evaluate the model's fit. In scale development research, CFA is typically performed after EFA. EFA identifies the number of factors and the items associated with each factor. Following this, CFA is utilized to test the model's fit with data from a different sample. This methodology involves using two groups in Structural Equation Modeling (SEM): one for conducting EFA and the other for CFA (Hair et al., 2022).

In the second stage, "Confirmatory Factor Analysis (CFA)" was utilized to test the confirmation of the structure determined by Exploratory Factor Analysis. Exploratory Factor Analysis (EFA) is initially conducted using data obtained from a population in studies focused on scale development. The EFA is used to identify the number of factors on the scale and the item corresponding to each factor. The model is then applied to a second sample group drawn from the same population to ascertain whether it is compatible. Confirmatory factor

Table 2. Descriptive Statistics on Participants' Education Level, Household Income, and Occupations.

Spatial designers			Istanbul residents		
Education status	Frequency	Percent	Education status	Frequency	Percent
Bachelor's degree	170	47.8	Elementary school – dropout	2	0.5
Master's degree	95	26.7	Elementary school	28	7.0
PhD degree	54	15.2	Middle school	21	5.3
Post-doctorate degree	37	10.4	High school	101	25.3
-	-	-	Vocational school graduate	51	12.8
-	-	-	Bachelor's degree	146	36.5
-	-	-	Master's degree	51	12.8
Total	356	100.0	Total	400	100.0
Income level	Frequency	Percent	Income level	Frequency	Percent
Less than 9.999 TL	9	2.5	Less than 9.999 TL	11	2.8
Between 10.000 and 19.999 TL	60	16.9	10.000–19.999 TL	77	19.3
Between 20.000 and 29.999 TL	87	24.4	20.000–29.999 TL	65	16.3
Between 30.000 and 39.999 TL	56	15.7	30.000–39.999 TL	72	18.0
40.000 TL and above	132	37.1	40.000 TL and above	91	22.8
Preferred not to disclose	12	3.4	Preferred not to disclose	84	21.0
Total	356	100.0	Total	400	100.0
Occupation	Frequency	Percent	Occupation	Frequency	Percent
Architect	91	25.6	No income-generating occupation, not working	104	26.0
Landscape architect	66	18.5	Salaried, employed	170	42.5
Urban planner	196	55.1	Self-employed, freelancer, qualified professional	118	29.5
Urban designer	3	0.8	Retired	8	2.0
Total	356	100.0	Total	400	100.0

Table 3. Participants' Average Daily Use of Digital Technologies.

What is your average daily time spent using digital technologies such as smartphones, laptops, tablets, public kiosks, and Wi-Fi?					
Spatial designers			Istanbul residents		
Technology use	Frequency	Percent	Technology use	Frequency	Percent
None	9	2.5	None	8	2.0
Less than 1 hr	12	3.4	Less than 1 hr	19	4.8
1 hr	10	2.8	1 hr	31	7.8
2 hr	41	11.5	2 hr	75	18.8
3 hr	57	16.0	3 hr	63	15.8
4 hr	64	18.0	4 hr	41	10.3
5 hr or more	163	45.8	5 hr or more	163	40.8
Total	356	100.0	Total	400	100.0

analysis, or CFA, was utilized for this. To determine the harmony difference between the assumed pattern of the model and the pattern acquired with the data, structural equation modeling is carried out when the factors that comprise the scale and the routes between factors are considered simultaneously. In addition, at the .05 significance level, the skewness coefficient analysis was performed to assess whether all the data adhered to a normal distribution. Cronbach Alpha reliability analyses were used as part of the scale's reliability studies.

Findings on Statistical Analysis of the Influences of Digital Technologies on Human Behavior in Public Space Scale

Findings on the Exploratory Factor Analysis of the Scale

Item analysis of the scale and an examination of the item-total score correlations for each of the 44 items occurred before Exploratory Factor Analysis was applied. The correlation coefficients of the scale's items, ranging from r = .508 to r = .812 and were statistically

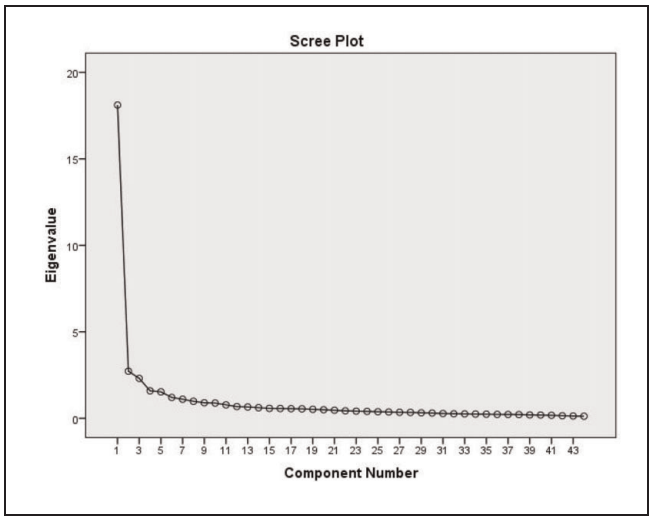

Figure 2. Scree plot of the scale.

noteworthy, proved to be in this spectrum. All the test items were, therefore, appropriate. A skewness coefficient analysis was carried out to ascertain whether the scale's items were distributed normally. For a normal distribution, a kurtosis value of ± 1.0 is considered excellent for most psychometric purposes. However, a kurtosis value of ± 1.5 (Tabachnick & Fidell, 2020) and a value of ± 2.0 is acceptable in many cases, depending on the application (George & Mallery, 2010). The analysis revealed that, except for item D102, all items on the scale had a normal distribution (Appendix 1).

The Kaiser-Meyer-Olkin (KMO) test was applied to test the suitability of the sample size for factorization. As a result of the analysis, it was determined that the KMO value was 0.950. In line with this fact, it was concluded that the sample size was "well enough" to conduct factor analysis (Çokluk et al., 2012). Once the Bartlett Sphericity Test results were investigated, the chi-square value obtained was found to be noteworthy ($X^2_{(946)} = 10{,}807.944$; $p = .000 < .01$). In this regard, it was assumed that the data followed a multivariate normal distribution. According to the analysis results, the Anti-image r values of the draft scale ranged between .801 and .974. For the 44 items used as the basis for the principal component analysis, 7 components had eigenvalues greater than 1. The contribution of these components to the total variance is 64.949%. Upon examining the scree plot, it became evident that there was a rapid acceleration following the first factor and a more gradual decline after the fifth factor. Consequently, it was determined that the scale could have five factors (Figure 2). In this context, it was decided to repeat the analysis for five factors.

Principal Components Analysis (PCA) was used as the exploratory factor analysis for the Consequences of Digital Transformation on Human Relations and Behavior in Public Space scale, and the oblique rotation method was preferred among the rotation methods. Furthermore, the acceptance level for factor load values obtained through PCA was 0.400. The items that make up the scale were discussed in terms of whether they showed overlapping structures and met the factor load values, and it was decided to remove the items that did not meet the conditions from the scale. In this context, six PCAs were conducted, and the following items were removed from the scale because their factor loadings showed an overlapping structure: D407. Over-reliance on technology causes us to overlook the nuances and complexities of public life, D111. Digital addiction can lead to social isolation and disconnection in public spaces as we become engrossed in our screens and online interactions, D102. Digital technology makes it easier for people to work and communicate from anywhere, D404. The spread of digital technologies negatively affects people's ideas and perceptions about public spaces by increasing media influence, D310. Over-connectedness reduces the fear of missing out on personal opportunities and real-life experiences and D101. Digital technology reduces people's dependence on physical spaces in the public space. In addition, D310 and D101 items were removed from the scale as their factor loadings were below the cut-off point of 0.400. In the seventh PCA, it was determined that each item in the scale met the acceptance conditions (Appendix 2). The KMO value was found to be 0.949. Additionally, according to the Bartlett sphericity test result, the chi-square value obtained was found to be significant ($X^2_{(703)} = 9371.983$; $p = .000 < .01$). According to the data, the first factor of the scale, revealing the scale, accounts for 42.636% of the total variance, the second factor accounts for 6.629%, the third factor accounts for 2.141%, the fourth factor accounts for 1.475%, and the fifth one accounts for 1.403%. The total variance ratio clarified by the five factors is 62.474%. In social sciences, it is considered sufficient for the variance explained to be between 40% and 60% (Çokluk et al., 2012). As a result, it was determined that the scale had been validated.

Lastly, digital technologies are named based on the factors that influence human behavior in public (Table 4):

- The first factor is "social isolation," which refers to the feeling of an individual or a group of people losing their social connections and moving away from society or social interactions,

Table 4. As a Result of PCA, Factor Loadings and Reliability Analysis Results of the Scale.

Factors		Items	Factor loadings	Eigenvalue	Variance (%)	Cronbach's alpha coefficient (α)
F1	Social isolation	11	0.855 to 0.452	16.202	42.636	0.946
F2	Media effects	7	0.727 to 0.505	2.519	6.629	0.812
F3	Homogenization and Placelessness	8	0.741 to 0.550	2.141	5.635	0.895
F4	Technostress-induced social anxiety	8	−0.866 to −0.527	1.475	3.880	0.915
F5	Digital addiction	4	0.845 to 0.794	1.403	3.693	0.894
Scale		38	−0.866 to 0.855	-	62.474	0.962

- The second factor is "media effects," as individuals often break away from real life and connections and attempt to develop an identity and socialize in the virtual environment, reducing social ties in the public space, adverse effects such as alienation, polarization, bullying, and individualization,
- The third factor is "homogenization and/or placelessness," as it contains items such as human behavior becoming like one another, loss of local identity, decrease in physical interaction between individuals in public spaces, and blurring of the boundary between physical and digital space,
- The fourth factor is "techno-stress-induced social anxiety," including items such as the pressure to constantly check social media and digital platforms, the fear of missing out on social experiences, and stress caused by excessive internet use,
- The fifth factor is "digital addiction," referring to the effects of an individual becoming overly dependent on electronic devices and platforms such as computers, smartphones, tablets, social media platforms, video games, or other digital technologies.

Findings Regarding the Confirmatory Factor Analysis of the Scale

The 38-item structure with the five factors found in the SPSS environment using exploratory factor analysis was validated using confirmatory factor analysis (CFA). Confirmatory Factor Analysis was conducted using Jamovi software. The maximum likelihood estimation method was chosen for this analysis. To demonstrate the structural validity of the scale, a sample obtained from individuals living in Istanbul was used. The data collected shows a multivariate normal distribution.

In confirmatory factor analysis (CFA), standardized estimate values greater than 0.50 indicate the significance of the values. Removing items with values lower than 0.50 from the model can contribute to the meaningfulness of the model. Similarly, by examining the observed correlation matrix for the observed variables, items with residual values above .1 can be removed from the scale, respectively, and the fit values can be improved. In addition, compliance values can be made more meaningful by adding or removing items with high modification indices (MI) values (Özalp, 2022). In this context, the fit indices and residual values matrix revealed because of the CFA were examined, and the residual values greater than 0.1 were D104, D209, D406, D408, D307, D105, D405, D306, D109, D207, D304, D110, D103, D208, items D210 and D305 were removed from the scale and provided acceptable fit indices. After removing the residual value items from the scale, 21 items remained in the scale. The scale in which we examined the fit values regarding CFA had acceptable fit values of the five-factor structure of "social isolation," "media effects," "homogenization and/or placelessness," "technology-induced social anxiety" and "digital addiction" (CMIN/$df = 12.77$), $p < .01$, RMSEA = 0.0665, CFI = 0.950, TLI = 0.941).

It is emphasized in the literature that the Chi-square test should not be statistically significant. However, the literature has revealed that this test is affected by the sample size and is sensitive in large samples (Bentler & Bonett, 1980). Alternatively, the value obtained by dividing the Chi-square value by the degrees of freedom (*df*) should be expected to be less than 3 (Meydan & Şeşen, 2015). In large samples, the X^2/sd ratio below 3 corresponds to perfect fit, and below 5 corresponds to moderate fit (Çokluk et al., 2012). Considering these data, Chi-square/sd was calculated as = 496/179 = 2.770 for the current data. It is seen that the obtained value is in perfect agreement with the fit index in the literature. In the analysis, it was determined that the non-normed fit index (TLI) and comparative fit index (CFI) were around 0.950, and the root mean error of approximation (RMSEA) value was close to 0.0665. The TLI value was 0.941. A CFI value of 0.97 and above indicates a perfect fit and a CFI value of 0.95 and above specifies a good fit (Bayram, 2013). TLI values of 0.95 and above are excellent; 0.90 and above indicate a good fit. The obtained CFI and TLI values are understood to be good with the fit indices determined in the literature. (Meydan & Şeşen, 2015). According to the literature, a RMSEA value less than or equal to 0.05 indicates a good fit and a value

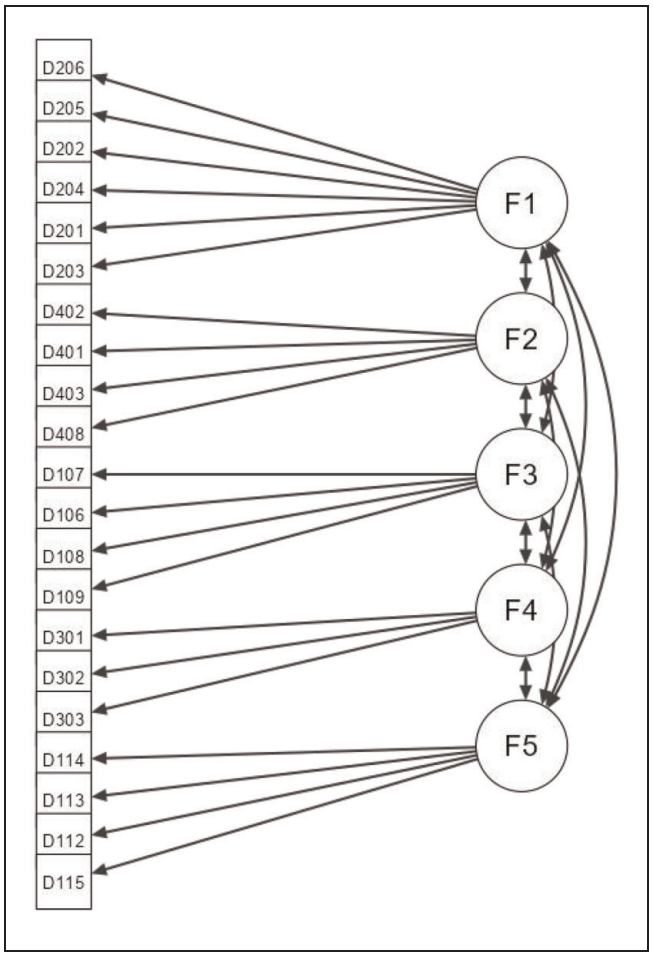

Figure 3. Factor structure of the scale according to CFA.

between 0.05 and 0.08 indicates an adequate fit; between 0.08 and 0.10 indicates a mediocre fit (Çelik & Yılmaz, 2016; Tabachnick & Fidell, 2020; Thompson, 2008). It is thought that the scale will contribute to the measurement of the impact of digital technologies on public space and social life. The scale's factor structure after its structural validity was ensured by confirmatory factor analysis is shown in Figure 3. Finally, because of the confirmatory factor analysis of the scale, it is determined that the standardized estimate values of the factor loadings are at an acceptable level and significant ($p < .001$; Table 5).

When the covariance values between the factors are examined, the highest covariance value is (0.892) between the social isolation (F1) and digital addiction (F5) dimensions; the lowest covariance value was found to be (0.599) between the dimensions of homogenization and/or placelessness (F3) and technology-induced social anxiety (F4; Table 6). "Cronbach alpha reliability analysis" was performed to determine the scale reliability of the structure obtained due to CFA. According to the findings, it is determined that social isolation ($\alpha = .925$), one of the components that make up the scale, is perfect as its reliability coefficient value is greater than 0.900. Techno-stress-induced social anxiety ($\alpha = .895$), digital addiction ($\alpha = .890$), homogenization/placelessness ($\alpha = .838$), media effect ($\alpha = .835$) factors are at a good level of reliability since their reliability coefficients are $0.7 \leqslant \alpha < .9$ (Table 7). Since the total reliability coefficient of the scale is 0.963, this value can be interpreted as excellent (Kılıç, 2016). Additionally, the structural equation model test findings indicate a good model fit (Table 8).

When the standardized prediction results of the model are examined; factor loadings for the social isolation (F1) latent variable are between 0.79 and 0.91. Factor loadings for the media effects (F2) latent variable are between 0.53 and 0.91, factor loadings for homogeneity and/or placelessness (F3) are between 0.75 and 0.85; for techno-stress-induced social anxiety (F4), it was between 0.89 and 0.91; for the Digital Addiction (F5) variable, factor loadings vary between 0.86 and 0.87. Moreover, according to the SEM model, when examining the standardized regression (β) coefficients among factors, it is observed that the digital addiction (F5) factor significantly predicts social isolation (F1; $\beta = .90$; $p < .01$), homogenization/placelessness (F3; $\beta = .74$; $p < .01$), techno-stress-induced social anxiety (F4; $\beta = .74$; $p < .01$), and media impact (F2; $\beta = .69$; $p < .01$) factors. The obtained data confirms hypothesis H2. Similarly, the media impact (F2) factor significantly predicts social isolation (F1; $\beta = .73$; $p < .01$), techno-stress-induced social anxiety (F4; $\beta = .74$; $p < .01$), homogeneity and/or placelessness (F3; $\beta = .73$; $p < .01$), and digital addiction (F5; $\beta = .69$; $p < .01$) factors at a significant level. The obtained data verifies hypothesis H3, indicating a crucial impact of media on social isolation, homogeneity and/or placelessness, and social anxiety (Figure 4; Ratner, 2009).

Discussion

The rapid advancement of digital technology has permeated many areas of daily life, affecting public spaces, everyday interactions in these spaces, and human behavior. The increased use of online social networks and portable mobile devices allows people to communicate with strangers and people from different cultures more effortlessly than they could achieve in person. In other words, because the ease of accessing groups of friends in cyberspace as individuals use online social networks meets the need for socialization to some extent, it also eliminates the need for individuals to gather in physical space and interact and communicate directly and face to face. Public spaces directly influence an individual's overall experience of urban space and truly reflect social diversity. For this reason, a decline in the use of public space can have an adverse effect on the dynamics of

Table 5. Factor Loadings of the Scale According to CFA.

Factor	Indicator	Estimate	*SE*	*Z*	*p*	Stand. estimate
F1	D206. The individualization that comes with digital technology causes face-to-face interaction to decrease.	0.795	0.0495	16.07	<.001	0.711
	D205. Instant connection and sharing opportunities offered by digital technology weaken social ties in the public space.	0.936	0.0457	20.48	<.001	0.839
	D202. Digital technology disrupts traditional forms of communication, leading to the disruption of social ties in public spaces.	1.038	0.0483	21.50	<.001	0.865
	D204. The proliferation of digital technology causes people to spend more time on virtual interactions rather than face-to-face interactions.	0.910	0.0440	20.68	<.001	0.844
	D201. Digital technology leads to alienation in public spaces as we focus on devices rather than interacting with those around us.	0.997	0.0480	20.76	<.001	0.847
	D203. The constant distraction caused by digital technology leads to a lack of focus and reduced connection with the physical environment.	0.942	0.0465	20.27	<.001	0.834
F2	D402. Echo chambers and filter bubbles exacerbate social and political polarization, making it difficult to find common ground in public debates.	0.982	0.0448	21.92	<.001	0.884
	D401. The proliferation of echo chambers and filter bubbles creates a fragmented public space in which individuals are increasingly isolated from each other.	0.990	0.0479	20.67	<.001	0.852
	D403. Digital technologies, with their echo chambers and filter bubbles, blur the boundaries between public and private.	0.933	0.0442	21.12	<.001	0.864
	D408. Digital technologies eliminate social barriers by facilitating interactions between people.	0.518	0.0577	8.97	<.001	0.444
F3	D107. Digital technology makes it difficult to distinguish one place from another (becoming similar spaces).	0.899	0.0579	15.54	<.001	0.714
	D106. Digital technologies have resulted in the convergence of human behavior and interaction.	0.868	0.0564	15.39	<.001	0.709
	D108. Digital technologies cause loss of diversity or local identity.	1.002	0.0522	19.20	<.001	0.831
	D109. The spread of digital technology leads to the formation of a similar consumption culture around the world.	0.880	0.0515	17.08	<.001	0.764
F4	D301. Digital technology causes technostress and social anxiety, causing individuals to feel overwhelmed.	1.021	0.0492	20.74	<.001	0.855
	D302. The pressure to be constantly accessible through digital technology leads to increased technostress and social anxiety.	1.028	0.0466	22.08	<.001	0.889
	D303. Over-reliance on digital technology results in decreased face-to-face social interaction and therefore increased social anxiety.	0.954	0.0470	20.30	<.001	0.843
F5	D114. Digital addiction affects individuals' time management skills, making it difficult for them to be efficient and effective in the public space.	0.984	0.0497	19.79	<.001	0.828
	D113. Digital addiction makes it difficult for individuals to be fully present in public spaces and interact with the world around them.	0.948	0.0482	19.67	<.001	0.826
	D112. Digital addiction creates a barrier to meaningful face-to-face interactions with others in public spaces.	0.896	0.0464	19.34	<.001	0.815
	D115. Digital addiction causes individuals to feel lonely in their daily lives and distance themselves from society.	0.937	0.0492	19.04	<.001	0.808

social life. In other words, the digitalization of social interaction indicates that the use of public spaces is changing. We cannot provide a public space system suitable for the digital age. In that case, it is doubtful whether we will have urban public spaces in future cities that can meet the requirements of citizens in line with technological advances (Badel & Lopez Baeza, 2021; Putnam, 2000). Therefore, as spatial designers, we must find ways to create urban spaces that are adaptable, compatible with shifting human attitudes and behaviors in the information age, and that can keep up with technological advancements if we desire to maintain public spaces as dynamic spaces for encounters, interactions, socialization, and social life activities. To accomplish this, it is paramount for spatial designers to develop problem-oriented, innovative solutions by comprehending how modern people's behaviors and attitudes toward public space use have transformed with technological

Table 6. Factor Covariance Values of the Scale According to CFA.

Factors		Estimate	*SE*	*Z*	*p*	Stand. estimate
F1	F1	1.000*				
	F2	0.692	0.0308	22.5	<.001	0.692
	F3	0.679	0.0338	20.1	<.001	0.679
	F4	0.769	0.0257	29.9	<.001	0.769
	F5	0.892	0.0164	54.3	<.001	0.892
F2	F2	1.000*				
	F3	0.689	0.0342	20.1	<.001	0.689
	F4	0.699	0.0317	22.1	<.001	0.699
	F5	0.667	0.0339	19.7	<.001	0.667
F3	F3	1.000*				
	F4	0.599	0.0398	15.0	<.001	0.599
	F5	0.711	0.0333	21.4	<.001	0.711
F4	F4	1.000*				
	F5	0.713	0.0312	22.9	<.001	0.713
F5	F5	1.000*				

*Fixed parameter.

advancements and the perceived social and psychological effects in social life. Based on this fact, this study aims to comprehend the positive and negative effects people believe have occurred in urban and social life due to technological advancement and the widespread use of online networks. Using the literature, an attempt was made to develop an inclusive scale associated with public life to determine the social and psychological effects of technology use in social life, and a structural equation model was proposed by testing the construct validity of the scale.

In this study, the effects of digital technology on human behavior were measured through the application of the scale and a systematic literature review. The first hypothesis (H1) stated in the study's framework, which posits that individuals' behaviors and attitudes in public spaces are determined by media, digital effects, technology-induced anxiety, social isolation, and social influences, was tested through both the systematic literature review and the application of the scale.

Using exploratory factor analysis to determine the scale's construct validity, a 38-item, five-factor structure with 62.474% of the variance explained was found. According to the significance of their contribution to the total variance, the study's factors that influence how people use digital technologies in daily life are classified as follows: social isolation (F1), media effect (F2), placelessness and/or homogenization (F3), techno-stress-related social anxiety (F4), and digital addiction (F5). The five-factor structure that emerged from the EFA results also supported H1. After exploratory factor analysis, confirmatory factor analysis was applied to the scale. As a result of the confirmatory factor analysis, the fit indices and residual values matrix were examined and the items D104, D209, D406, D408, D307, D105, D405, D306, D109, D207, D304, D110, D103, D208, D210, and D305 with residual values greater than 0.1 were examined. It was decided to remove it from the scale. Accordingly, it was determined that the goodness of fit indices of the established model were within the acceptable range (CMIN/DF = 2.770, RMSEA = 0.0665, CFI = 0.950, TLI = 0.941). The Cronbach's Alpha coefficient of internal consistency was employed to assess the reliability of the scale developed in this study. The evaluations revealed that the scale's reliability criteria were properly encountered. Finally, structural equation modeling (SEM) was performed to examine the relationship networks between the observed variables. The SEM findings indicate a strong relationship between the social isolation factor (F1) and the factors of homogenization and/or placelessness (F3), techno-stress-related social anxiety (F4), and digital addiction. This also tested H2 of the article, revealing the relationship between digital addiction and homogenization, social isolation, and social anxiety. This could imply that people who are more socially anxious and lonely use social media more frequently, intensely, and addictively. The study discovers that the effect of media (F2) on techno-stress-related social anxiety (F4) is relatively greater than its effect on the factors of homogenization and/or placelessness (F3), social isolation (F1), and digital addiction (F5). The hypothesis tested in H3 was that media increases social isolation, homogenization, and social anxiety. The test confirmed these relationships, highlighting a stronger link with technology-induced social

Table 7. Reliability Indices of the Scale.

Variable	α	Ordinal α	ω_1	ω_2	ω_3	AVE
F1: Social isolation	.925	.945	0.931	0.931	0.944	0.757
F2: Media effects	.835	.868	0.859	0.859	0.875	0.673
F3: Homogeneity/placelessness	.838	.876	0.853	0.853	0.862	0.651
F4: Technostress induced social anxiety	.895	.922	0.898	0.898	0.905	0.807
F5: Digital addiction	.890	.918	0.898	0.898	0.910	0.752

Note. The reliability coefficient (α), $\alpha \geqslant .9$ excellent; $0.7 \leqslant \alpha < .9$ is good; $0.6 \leqslant \alpha < .7$ is acceptable; $0.5 \leqslant \alpha < .6$ is poor, $\alpha < .5$ is unacceptable (Kılıç, 2016).

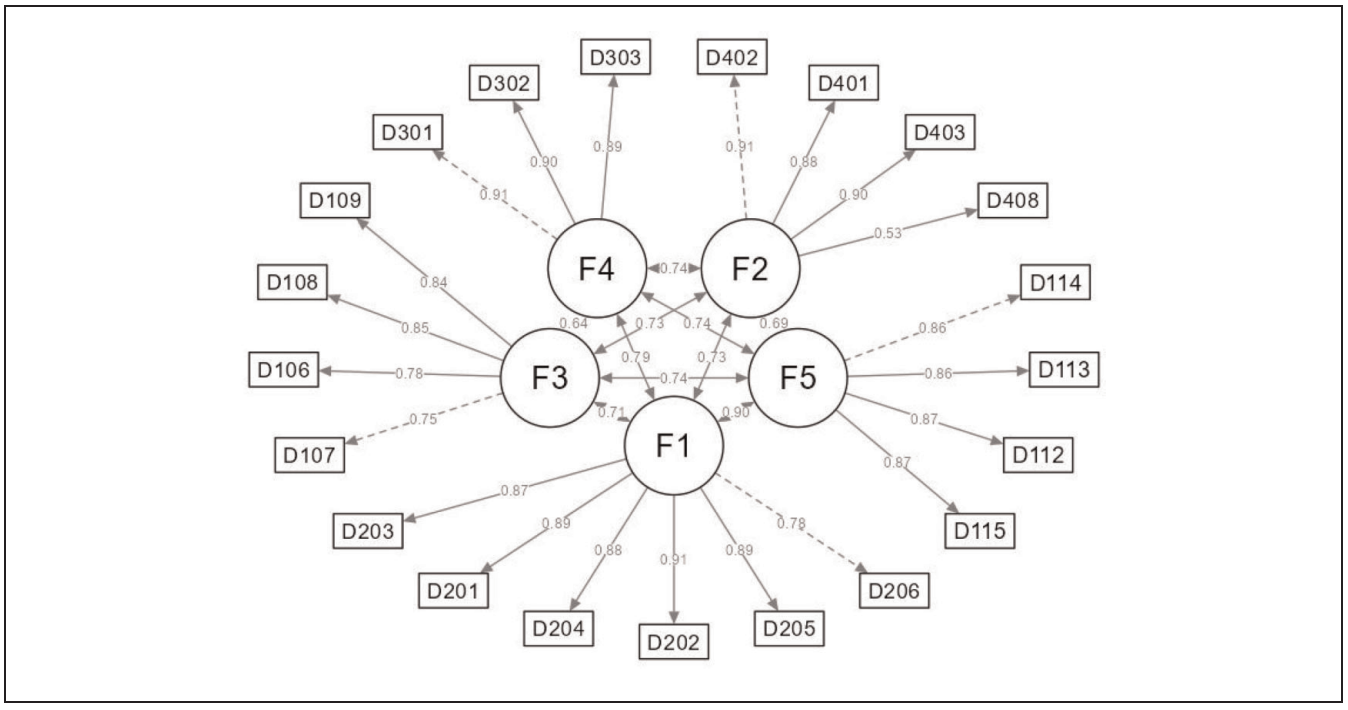

Figure 4. Structural equation model of the influences of digital technologies on human behavior in public space scale.

Table 8. Structural Equation Model Test Findings of the Scale.

Goodness-of-Fit Indices	Goodness-of-fit indices for the research model	Acceptable fit values*
CMIN/DF (x^2/df)	1.50	⩽3 or ⩽5
RMSEA	0.036	0.05 < RMSEA⩽0.80
CFI	0.999	0.95 ⩽ CFI⩽0.97
TLI	0.999	⩾ 0.90
IFI	0.999	⩾ 0.85
NFI	0.997	0.90 ⩽ NFI⩽0.95
RFI	0.997	0.90 ⩽ RFI ⩽ 0.95
GFI	0.998	0.90 ⩽ GFI⩽0.95

*Source: Derived from Bayram (2013), Meydan and Şeşen (2015), Çelik and Yılmaz (2016), İlhan and Çetiän (2014), Karakaya Ozyer (2021) , Yaşlıoğlu (2017), and Çokluk et al. (2012).

anxiety. Analyzing the hypotheses in H2, H4, and H5, comparable correlations between the variables were found. Similarly, the digital addiction factor (F5) is found to significantly predict the social isolation (F1) factor ($\beta = .90$; $p < .01$). This also highlights the relationship between digital addiction and social isolation stated in H5. It also appears to significantly affect the factors of placelessness and/or homogeneity (F3; $\beta = .74$; $p < .01$) and technology-induced social anxiety ($\beta = .74$; $p < .01$; H4). It is evident that the media impact factor has the most influence on social anxiety and concurrently exposes the individual to feelings of homogenization and/or placelessness and anxiety (H3). Moreover, the goodness-of-fit values of the model indicate acceptable or even high levels of model fit (CMIN/df = 1.50, $p < .01$, RMSEA = 0.036, SRMR = 0.036, CFI = 0.999, TLI = 0.999). As a result, according to the model, it is possible to say that digital addiction increases social isolation, placelessness, and anxiety in individuals. The findings obtained from Primack et al. (2017) and O'Day and Heimberg (2021) are like their studies. Primack et al. (2017) reveal in their study that social media use has a strong relationship with perceived social isolation. O'Day and Heimberg (2021) stated that social media use among young adults boosts the sensation of social anxiety and loneliness. They revealed that individuals with social anxiety and loneliness desire online social connections more than other users. Meshi et al.'s (2020) study shows that there is a relationship between problematic social media use and perceived social isolation in older adults (Meshi et al., 2020). Similarly, Shaw et al. (2015) revealed that passive social media usage has a strong relationship with social anxiety. However, several experimental studies have also displayed that being more active on social media alleviates loneliness, especially among young individuals whose identity needs to be adequately developed (Yang et al., 2020). Reddy and Yadav (2023) have elucidated the impacts of technology on university students globally, particularly discussing various effects in areas such as access to educational resources, communication and

collaboration, attention distractions, isolation, and the need for constant connectivity. In addition to these studies, when looking at the literature on digital technology and human relationships, it is noted that while digital technology brings many conveniences to our lives, there are also areas that need focused attention. In this regard, Tanjung and Santosa (2023) highlight the many positive aspects provided by technology but also emphasize the preservation of traditional cultures, intergenerational harmony, and privacy issues as technology advances. Additionally, studies in psychology and neurology are being conducted on the impact of digital technology on human behavior. Korte (2020) states that neurological studies are very important for understanding the effects of digital media use on the human brain. For instance, it is predicted that intensive digital media use could alter the human brain through neuronal plasticity processes; however, how these technologies affect human cognition and emotional processing in social contexts remains unclear (Korte, 2020).

Many studies on social media use in the literature are cross-sectional. Although these cross-sectional studies attempt to reveal the relationship between social media use and social isolation, societal anxiety, and loneliness, more research is required to comprehend the causal pathways in these relationships. As a result, this study differs from others in the literature in its endeavor to reveal the perceived impact of digital technologies on human attitudes and behaviors in public life in a comprehensive manner. Nevertheless, it would be noteworthy for researchers and practitioners to apply the scale proposed in this study to individuals with diverse demographic attributes and to resemble the factors in the scale with variables such as individuals' socio-demographic features, the purpose for which online applications are used, how frequently they are applied, and how the public space is perceived. Increasing the scope of the study with a more representative sampling method and the use of the scale will provide more information about how people's attitudes and behaviors toward public spaces evolve as they engage with digital technology. As a result, in their forthcoming study, the authors will broaden the scope of the study by concentrating on such issues.

Conclusion

This study examined the extensive effects of digital technologies on public life and human behavior, highlighting outcomes related to social isolation, media effects, placelessness/homogenization, techno-stress-related social anxiety, and digital addiction. The findings indicate that the digital age has had a substantial impact on the use of public space. If spatial designers do not adjust public spaces to technological advancements, social life may struggle to keep up with this new reality. To ensure that public spaces remain dynamic for encounter, interaction, socialization, and community life activities, we must better comprehend people's interactions with digital technologies and design public spaces to reflect these varying attitudes and behaviors. The study's results suggest that digital addiction significantly increases social isolation, placelessness, and anxiety among individuals. The media effect plays a substantial role in exacerbating social anxiety and contributing to feelings of homogenization and placelessness.

The study's results fundamentally indicate that digital technologies have transformed social interaction by reducing the need for face-to-face communication, leading to increased virtual interactions and potentially weakening community bonds while increasing feelings of isolation. As a result, public spaces are evolving, with their role shifting toward accommodating digital socialization and information exchange, necessitating the integration of digital elements to maintain their relevance. Additionally, the pervasive use of digital technologies has been linked to mental health issues such as techno-stress, social anxiety, and digital addiction, which can negatively impact individuals' overall well-being and their engagement with public spaces. Furthermore, the global reach of digital media fosters cultural homogenization, often overshadowing local identities and practices and resulting in less distinctive and culturally rich public spaces.

To address the challenges identified in this study, public spaces should be designed for flexibility and adaptability, capable of supporting both face-to-face and virtual interactions. Interdisciplinary collaboration between spatial designers, urban planners, sociologists, geographers, psychologists, and technologists is crucial to developing innovative solutions that address the challenges posed by the digital age. By integrating perspectives from various fields, we can create public spaces that accommodate technological advancements while enhancing social well-being and community cohesion.

Ongoing research is essential to explore how different demographic groups interact with digital technologies in public spaces, informing inclusive design strategies that cater to diverse needs and preferences. Expanding the scope of studies to include more representative samples and diverse demographic groups will provide richer insights into the evolving dynamics of public space utilization.

In conclusion, this study underscores the critical need to reimagine public spaces in the context of rapid technological change. By understanding and addressing the impacts of digital technologies on human behavior, we can design urban environments that support vibrant, inclusive, and resilient communities. This study is expected to provide insights for all stakeholders in public spaces, notably spatial and social scientists.

Appendix 1. Normality Analysis Results of Scale Items Belonging to the Sample of Experts and Residents.

Descriptives					
		Spatial designers		Residents	
		Statistic	Std. error	Statistic	Std. error
D101. Digital technology reduces people's dependence on physical spaces in the public space.	Mean	3.7978	.05273	3.72	.062
	Skewness	−.931	.129	−.878	.122
	Kurtosis	.603	.258	−.225	.243
D102. Digital technology makes it easier for people to work and communicate from anywhere.	Mean	4.3567	.04282	4.06	.055
	Skewness	−1.833	.129	−1.294	.122
	Kurtosis	4.757	.258	1.022	.243
D103. The ability to access digital content from anywhere obscures the boundary between physical and digital space, resulting in a feeling of out of place.	Mean	3.4213	.05701	3.47	.060
	Skewness	−.409	.129	−.500	.122
	Kurtosis	−.474	.258	−.651	.243
D104. By changing the concept of space in the virtual world, digital technology reduces people's necessity to localize and establish social ties in public spaces.	Mean	3.5393	.05685	3.69	.059
	Skewness	−.626	.129	−.753	.122
	Kurtosis	−.278	.258	−.311	.243
D105. Because digital technologies may be utilized anywhere, physical interaction between people in public spaces is decreasing.	Mean	3.8427	.05301	3.75	.061
	Skewness	−.852	.129	−.826	.122
	Kurtosis	.310	.258	−.295	.243
D106. Digital technologies have resulted in the convergence of human behavior and interaction.	Mean	3.7022	.05515	3.58	.061
	Skewness	−.737	.129	−.590	.122
	Kurtosis	.090	.258	−.634	.243
D107. Digital technology makes it difficult to distinguish one place from another (becoming similar spaces).	Mean	3.29	.058	3.28	.063
	Skewness	−.159	.129	−.341	.122
	Kurtosis	−.758	.258	−.953	.243
D108. Digital technologies cause loss of diversity or local identity.	Mean	3.4157	.05795	3.49	.060
	Skewness	−.349	.129	−.475	.122
	Kurtosis	−.663	.258	−.772	.243
D109. The spread of digital technology leads to the formation of a similar consumption culture around the world.	Mean	4.0562	.04798	3.75	.058
	Skewness	−1.165	.129	−.672	.122
	Kurtosis	1.562	.258	−.498	.243
D110. The access provided by digital technology enables individuals to interact more with global media and culture, thus leading to spatial uniformity.	Mean	3.6517	.05178	3.68	.056
	Skewness	−.495	.129	−.599	.122
	Kurtosis	−.311	.258	−.502	.243
D111. Digital addiction can lead to social isolation and disconnection in public spaces as we become engrossed in our screens and online interactions.	Mean	3.93258	.050663	3.86	.058
	Skewness	−.954	.129	−1.032	.122
	Kurtosis	.590	.258	.280	.243
D112. Digital addiction creates a barrier to meaningful face-to-face interactions with others in public spaces.	Mean	3.7612	.05503	3.82	.055
	Skewness	−.891	.129	−.834	.122
	Kurtosis	.275	.258	−.021	.243
D113. Digital addiction makes it difficult for individuals to be fully present in public spaces and interact with the world around them.	Mean	3.8034	.05368	3.74	.057
	Skewness	−.955	.129	−.714	.122
	Kurtosis	.647	.258	−.381	.243
D114. Digital addiction affects individuals' time management skills. making it difficult for them to be efficient and effective in the public space.	Mean	3.7949	.05367	3.66	.060
	Skewness	−.742	.129	−.668	.122
	Kurtosis	.057	.258	−.499	.243
D115. Digital addiction causes individuals to feel lonely in their daily lives and distance themselves from society.	Mean	3.6180	.05513	3.70	.058
	Skewness	−.514	.129	−.645	.122
	Kurtosis	−.273	.258	−.499	.243
D201. Digital technology leads to alienation in public spaces as we focus on devices rather than interacting with those around us.	Mean	3.7022	.05385	3.73	.059
	Skewness	−.657	.129	−.765	.122
	Kurtosis	−.201	.258	−.302	.243
D202. Digital technology disrupts traditional forms of communication, leading to the disruption of social ties in public spaces.	Mean	3.6517	.05238	3.66	.060
	Skewness	−.629	.129	−.675	.122
	Kurtosis	−.212	.258	−.524	.243
D203. The constant distraction caused by digital technology leads to a lack of focus and reduced connection with the physical environment.	Mean	3.9607	.05012	3.74	.057
	Skewness	−1.027	.129	−.727	.122
	Kurtosis	.811	.258	−.246	.243

(continued)

Appendix 1. (continued)

Descriptives					
		Spatial designers		Residents	
		Statistic	Std. error	Statistic	Std. error
D204. The proliferation of digital technology causes people to spend more time on virtual interactions rather than face-to-face interactions.	Mean	3.9916	.05102	3.82	.054
	Skewness	−1.203	.129	−.734	.122
	Kurtosis	1.392	.258	−.153	.243
D205. Instant connection and sharing opportunities offered by digital technology weaken social ties in the public space.	Mean	3.6854	.05268	3.78	.056
	Skewness	−.478	.129	−.729	.122
	Kurtosis	−.591	.258	−.331	.243
D206. The individualization that comes with digital technology causes face-to-face interaction to decrease.	Mean	3.8062	.05029	3.83	.056
	Skewness	−.798	.129	−.977	.122
	Kurtosis	.289	.258	.363	.243
D207. Digital technology creates a paradoxical situation in which we are more connected than ever before, yet more isolated and individualized.	Mean	3.9213	.05062	3.77	.052
	Skewness	−.915	.129	−.726	.122
	Kurtosis	.602	.258	−.037	.243
D208. With the increasing use of personal devices in public spaces, people are becoming more isolated from each other.	Mean	3.8848	.04923	3.77	.054
	Skewness	−.787	.129	−.674	.122
	Kurtosis	.269	.258	−.299	.243
D209. Digital technology increases individualization by weakening social ties.	Mean	3.7584	.05257	3.74	.056
	Skewness	−.755	.129	−.681	.122
	Kurtosis	.158	.258	−.399	.243
D210. In a society individualized by digital technology, the importance of common values and shared experiences decreases.	Mean	3.6067	.05785	3.65	.059
	Skewness	−.504	.129	−.606	.122
	Kurtosis	−.601	.258	−.606	.243
D301. Digital technology causes technostress and social anxiety, causing individuals to feel overwhelmed.	Mean	3.6096	.05313	3.60	.060
	Skewness	−.590	.129	−.665	.122
	Kurtosis	−.028	.258	−.399	.243
D302. The pressure to be constantly accessible through digital technology leads to increased technostress and social anxiety.	Mean	3.8090	.05133	3.66	.058
	Skewness	−.825	.129	−.683	.122
	Kurtosis	.368	.258	−.370	.243
D303. Over-reliance on digital technology results in decreased face-to-face social interaction and therefore increased social anxiety.	Mean	3.7837	.04875	3.71	.057
	Skewness	−.628	.129	−.686	.122
	Kurtosis	.043	.258	−.350	.243
D304. The information load created by digital technology creates problems in individuals such as decision-making difficulties, information pollution, and anxiety about accessing information.	Mean	3.8483	.05539	3.68	.058
	Skewness	−.780	.129	−.704	.122
	Kurtosis	−.098	.258	−.327	.243
D305. Extensive use of technology causes time management problems, which increases stress levels.	Mean	3.8989	.05310	3.69	.061
	Skewness	−.928	.129	−.715	.122
	Kurtosis	.388	.258	−.420	.243
D306. Hyperconnectivity through digital technology creates a sense of constant connection with others, leading to increased fear of missing out on social experiences.	Mean	3.6966	.05181	3.54	.058
	Skewness	−.544	.129	−.608	.122
	Kurtosis	−.239	.258	−.368	.243
D307. The pressure to constantly check social media and other digital platforms leads to anxiety and stress as individuals feel compelled to stay connected.	Mean	3.8258	.05226	3.61	.057
	Skewness	−.708	.129	−.634	.122
	Kurtosis	−.099	.258	−.312	.243
D308. The hyper-connectivity and fear of missing out (FOMO) created by digital technology leads to the prioritization of virtual social connections over real-life social interaction in public spaces.	Mean	3.7163	.05280	3.65	.057
	Skewness	−.627	.129	−.654	.122
	Kurtosis	−.036	.258	−.350	.243
D309. The constant connection created by digital technology reduces individuals' interest in real-life social interactions.	Mean	3.7584	.05088	3.68	.056
	Skewness	−.749	.129	−.723	.122
	Kurtosis	.192	.258	−.169	.243
D310. Hyperconnectivity reduces the fear of missing out on personal opportunities and real-life experiences.	Mean	3.2388	.06269	3.31	.065
	Skewness	−.184	.129	−.316	.122
	Kurtosis	−.894	.258	−1.036	.243
D401. The proliferation of echo chambers and filter bubbles creates a fragmented public space in which individuals are increasingly isolated from each other.	Mean	3.7893	.04978	3.57	.058
	Skewness	−.819	.129	−.511	.122
	Kurtosis	.622	.258	−.484	.243

(continued)

Appendix 1. (continued)

Descriptives					
		Spatial designers		Residents	
		Statistic	Std. error	Statistic	Std. error
D402. Echo chambers and filter bubbles exacerbate social and political polarization. making it difficult to find common ground in public debates.	Mean	3.8792	.05077	3.61	.056
	Skewness	−.819	.129	−.450	.122
	Kurtosis	.401	.258	−.564	.243
D403. Digital technologies, with their echo chambers and filter bubbles, blur the boundaries between public and private.	Mean	3.6770	.04999	3.59	.054
	Skewness	−.732	.129	−.443	.122
	Kurtosis	.417	.258	−.481	.243
D404. The proliferation of digital technologies increases media influence, negatively affecting people's ideas and perceptions about public spaces.	Mean	3.4944	.05330	3.57	.056
	Skewness	−.327	.129	−.450	.122
	Kurtosis	−.475	.258	−.559	.243
D405. Digital technology causes people to behave in ways that cannot be done in face-to-face interactions, resulting in a lack of courtesy and respect.	Mean	3.8708	.05612	3.68	.059
	Skewness	−.799	.129	−.674	.122
	Kurtosis	−.075	.258	−.415	.243
D406. Social media platforms create a culture of impulsivity and instant gratification in our public interactions.	Mean	3.8062	.05013	3.73	.054
	Skewness	−.889	.129	−.673	.122
	Kurtosis	.943	.258	−.140	.243
D407. Over-reliance on technology causes us to miss the nuances and complexities of public life.	Mean	3.8652	.04836	3.68	.055
	Skewness	−.782	.129	−.498	.122
	Kurtosis	.350	.258	−.591	.243
D408. Digital technologies eliminate social barriers by facilitating interactions between people.	Mean	3.4551	.05050	3.46	.058
	Skewness	−.490	.129	−.445	.122
	Kurtosis	−.187	.258	−.612	.243
D409. Digital technologies can provide a sense of anonymity and freedom, making people less likely to comply with laws and rules.	Mean	3.7669	.05123	3.57	.058
	Skewness	−.554	.129	−.500	.122
	Kurtosis	−.054	.258	−.638	.243

Appendix 2. Number of Factors, Factor Loadings, and Reliability Results According to the Final PCA Analysis of the Scale.

Items	Component				
	F1	F2	F3	F4	F5
D206. The individualization that comes with digital technology causes face-to-face interaction to decrease.	0.855				
D205. Instant connection and sharing opportunities offered by digital technology weaken social ties in the public space.	0.815				
D202. Digital technology disrupts traditional forms of communication, leading to the disruption of social ties in public spaces.	0.802				
D204. The proliferation of digital technology causes people to spend more time on virtual interactions rather than face-to-face interactions.	0.8				
D201. Digital technology leads to alienation in public spaces as we focus on devices rather than interacting with those around us.	0.751				
D209. Digital technology increases individualization by weakening social ties.	0.732				
D208. With the increasing use of personal devices in public spaces, people are becoming more isolated from each other.	0.718				
D207. Digital technology creates a paradoxical situation in which we are more connected than ever before, yet more isolated and individualized.	0.659				
D210. In a society individualized by digital technology, the importance of common values and shared experiences decreases.	0.649				
D203. The constant distraction caused by digital technology leads to a lack of focus and reduced connection with the physical environment.	0.636				
D309. The constant connection created by digital technology reduces individuals' interest in real-life social interactions.	0.452				
D409. Digital technologies can provide a sense of anonymity and freedom, making people less likely to comply with laws and rules.		0.727			

(continued)

Appendix 2. (continued)

Items	Component				
	F1	F2	F3	F4	F5
D408. Digital technologies eliminate social barriers by facilitating interactions between people.		0.634			
D402. Echo chambers and filter bubbles exacerbate social and political polarization, making it difficult to find common ground in public debates.		0.606			
D401. The proliferation of echo chambers and filter bubbles creates a fragmented public space in which individuals are increasingly isolated from each other.		0.557			
D405. Digital technology causes people to behave in ways that cannot be done in face-to-face interactions, resulting in a lack of courtesy and respect.		0.527			
D406. Social media platforms create a culture of impulsivity and instant gratification in our public interactions.		0.526			
D403. Digital technologies, with their echo chambers and filter bubbles, blur the boundaries between public and private.		0.505			
D104. By changing the concept of space in the virtual world, digital technology reduces people's necessity to localize and establish social ties in public spaces.			0.741		
D107. Digital technology makes it difficult to distinguish one place from another (becoming similar spaces).			0.721		
D106. Digital technologies have resulted in the convergence of human behavior and interaction.			0.68		
D108. Digital technologies cause loss of diversity or local identity.			0.611		
D110. The access provided by digital technology enables individuals to interact more with global media and culture, thus leading to spatial uniformity.			0.61		
D105. Because digital technologies may be utilized anywhere, physical interaction between people in public spaces is decreasing.			0.593		
D109. The spread of digital technology leads to the formation of a similar consumption culture around the world.			0.574		
D103. The ability to access digital content from anywhere obscures the boundary between physical and digital space, resulting in a feeling of out of place.			0.55		
D306. Hyperconnectivity through digital technology creates a sense of constant connection with others, leading to increased fear of missing out on social experiences.				−0.866	
D307. The pressure to constantly check social media and other digital platforms leads to anxiety and stress as individuals feel compelled to stay always connected.				−0.819	
D305. Extensive use of technology causes time management problems, which increases stress levels.				−0.726	
D301. Digital technology causes technostress and social anxiety, causing individuals to feel overwhelmed.				−0.663	
D308. The hyper-connectivity and fear of missing out (FOMO) created by digital technology leads to the prioritization of virtual social connections over real-life social interaction in public spaces.				−0.659	
D302. The pressure to be constantly accessible through digital technology leads to increased technostress and social anxiety.				−0.63	
D304. The information load created by digital technology creates problems in individuals such as decision-making difficulties, information pollution, and anxiety about accessing information.				−0.605	
D303. Over-reliance on digital technology results in decreased face-to-face social interaction and therefore increased social anxiety.				−0.527	
D114. Digital addiction affects individuals' time management skills, making it difficult for them to be efficient and effective in the public space.					0.845
D113. Digital addiction makes it difficult for individuals to be fully present in public spaces and interact with the world around them.					0.839
D112. Digital addiction creates a barrier to meaningful face-to-face interactions with others in public spaces.					0.821
D115. Digital addiction causes individuals to feel lonely in their daily lives and distance themselves from society.					0.794
Eigenvalue	**16.202**	2.519	2.141	**1.475**	**1.403**
Explained variance (%)	42,636	6.629	2.141	1.475	1.403
Number of items	11	7	8	8	4
Cronbach's alpha reliability coefficient (α)	0.946	0.812	0.895	0.915	0.894

If Cronbach's alpha (α) is $\geqslant .9$, it is excellent; if $.9 > \alpha \geqslant .8$, it is good, and if $.8 > \alpha \geqslant .7$, it is considered acceptable.

Declaration of Conflicting Interests

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

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work has been supported by Yildiz Technical University Scientific Research Projects Coordination Unit under project number FBA-2023-5807.

ORCID iDs

Aslı Altanlar https://orcid.org/0000-0002-4876-9527
Esin Özlem Aktuğlu Aktan https://orcid.org/0000-0001-9823-1007
İbrahim Eren https://orcid.org/0000-0002-0259-4821

Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

References

Al Atiqi, M., Chang, S., & Deguchi, H. (2020). *Agent-based approach to resolve the conflicting observations of online echo chamber* [Conference session]. Proceedings of the 11th International Conference on Soft Computing and Intelligent Systems and 21st International Symposium on Advanced Intelligence Systems. IEEE. https://doi.org/10.1109/SCISISIS50064.2020.9322696

Aldinhas Ferreira, M. I. (2022). On human condition: The status of Work. In M. I. Aldinhas Ferreira, & S. R. Fletcher içinde (Eds.), *The 21st Century Industrial Robot: When Tools become collaborators* (pp. 1–16). Springer.

ATDE. (2015). *Accenture dijitalleşme endeksi türkiye sonuçları: Türkiye'nin en dijital şirketleri 2015*. Türkiye Bilişim Vakfı. https://www.tbv.org.tr/raporlar

Badel, F., & Lopez Baeza, J. (2021). Digital public space for a digital society: A review of public spaces in the digital age. *Journal of Architecture, Engineering* and *Fine Arts*, *3*(2), 127–137. https://asosindex.com.tr/index.jsp?modul=articles-page&journal-id=26&article-id=606888

Baudrillard, J. (1994). *Simulacra and simulation*. (S. F. Glaser, Trans.) The University of Michigan Press. (Original work published 1981)

Bauman, Z. (2008). *The Individualized Society*. Polity.

Bauman, Z. (2013). *The Individualized Society*. John Wiley & Sons.

Bayram, N. (2013). *Yapısal Eşitlik Modellemesine Giriş AMOS Uygulamaları* (Introduction to Structural Equation Modeling AMOS applications). Ezgi Kitabevi.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588–606.

Brubaker, R. (2020). Digital hyperconnectivity and the self. *Theory and Society*, *49*(5-6), 771–801. https://doi.org/10.1007/s11186-020-09405-1

Brubaker, R. (2023). *Hyperconnectivity and its discontents*. John Wiley & Sons.

Büyüközkan, G., & Göçer, F. (2018). Digital supply chain: Literature review and a proposed framework for future research. *Computers in Industry*, *97*, 157–177.

Castells, M. (1999). *Information technology, globalization, and social development* (Vol. 114). UNRISD.

Castells, M. (2010). *The rise of network society*. Wiley-Blackwell.

Çelik, E., & Yılmaz, V. (2016). *LISREL 9.1 ile Yapısal Eşitlik Modellemesi* (Structural equation modeling with LISREL 9.1). Anı.

Chayko, M. (2020). *Superconnected: The internet, digital media, and techno-social life*. Sage Publications.

Çokluk, Ö., Şekercioğlu, G., & Büyüköztürk, . (2012). *Sosyal Bilimler için Çok Değişkenli İstatistik SPSS ve LISREL Uygulamaları*. Pegem.

Demir, M. (2022). *JAMOVİ ve JASP Programı ile Temel ve İleri Düzey Nicel Veri Analizi*. Pegem Akademi.

Ellen Frederick, D. (2016). Libraries, data and the fourth industrial revolution (Data Deluge Column). *Library Hi Tech News*, *33*(5), 9–12. https://doi.org/10.1108/lhtn-05-2016-0025

Erdönmez, E., & Çelik, F. (2016). Kentsel mekânda kamusal alan ilişkileri. *TÜBA-KED Türkiye Bilimler Akademisi Kültür Envanteri Dergisi* (Turkish Academy of Sciences Journal of Cultural Inventory), *14*, 145–163.

Eren, İ., Aktuğlu Aktan, E. Ö., & Altanlar, A. (2024, March 8–10). *Redefining public space: The evolution of meaning in the digital era* [Conference session]. 8th International Conference on Research in Social Sciences (RSSCONF). Prague/Çek Cumhuriyeti (pp. 1–13). https://doi.org/10.33422/rssconf.V1i1.204

Eren, İ., & Aktuğlu Aktan, E. Ö. (2023). Public life in flux: A journey from the 1940s to the present. *Cogent Social Sciences*, *9*(2), 1–26 https://doi.org/10.1080/23311886.2023.2281063

Farahdina, D., Loebis, M. N., & Zahrah, W. (2020). The influence of social media on use in public space (Case Study of Lapangan Merdeka Medan). *IOP Conference Series Earth and Environmental Science*, *452*(1), 14. https://doi.org/10.1088/1755-1315/452/1/012061

George, D, & Mallery, M (Eds.). (2010). *SPSS for windows step by step: A simple guide and reference, 17.0 Update* (10th ed.). Pearson.

Gökgür, P. (2017). *Kentsel Mekânda Kamusal Alanın Yeri*. Bağlam Yayıncılık.

Gorsuch, R. L. (1983). *Factor analysis*. Lawrence Erlbaum.

Hair, J. F. Jr, Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (Eds.). (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage Publications, Inc.

Hatcher, L. (1994). *A step-by-step approach to using the SAS system for factor analysis and structural equation modeling*. SAS Institute.

İlhan, M., & Çetiän, B. (2014). LISREL ve AMOS Programları Kullanılarak Gerçekleştirilen Yapısal Eşitlik Modeli (YEM)

Analizlerine İlişkin Sonuçların Karşılaştırılması. *Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi*, *5*(2), 26–42.

Jamieson, K. H., & Cappella, J. N. (2010). *Echo chamber: Rush Limbaugh and the conservative media establishment*. Oxford University Press.

Karakaya Özyer, K. (2021). Ölçek Geliştirme ve Güvenirlik Analizleri: Jamovi Uygulamasi. *Turkish Academic Research Review*, *6*(5), 1330–1384. https://doi.org/10.30622/tarr.1004560

Konrath, S. H., O'Brien, E. H., & Hsing, C. (2011). Changes in dispositional empathy in American college students over time: A meta-analysis. *Personality and Social Psychology Review*, *15*(2), 180–198. https://doi.org/10.1177/1088868310377395

Korte, M. (2020). The impact of the digital revolution on human brain and behavior: where do we stand?. *Dialogues in Clinical Neuroscience*, *22*(2), 101–111. https://doi.org/10.31887/DCNS.2020.22.2/mkorte

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PLoS One*, *8*(8), 1–6. https://doi.org/10.1371/journal.pone.0069841

Kusumota, L., Diniz, M. A. A., Ribeiro, R. M., Silva, I. L. C. D., Figueira, A. L. G., Rodrigues, F. R., & Rodrigues, R. A. P. (2022). Impact of digital social media on the perception of loneliness and social isolation in older adults. *Revista Latino-Americana de Enfermagem*, *30*, e3526. https://doi.org/10.1590/1518-8345.5641.3526

Kılıç, S. (2016). Cronbch'ın Alfa Güvenirlik Katsayısı. *Journal of Mood Disorders*, *6*((19), 47–48.

Lefebvre, H. (1991). *The critique of everyday life. Volume 1: Introduction*. Verso Books.

Lefebvre, H. (2010). *Gündelik Hayatın Eleştirisi II (Critique of Everyday Life II). (Original version: Critique de la vie quotidienne* (I. Ergüden, Çev.) Yayıncılık.

Levin, I., & Mamlok, D. (2021). Culture and society in the digital age. *Information*, *12*(2), 68. https://doi.org/10.3390/info12020068

Liu, E., & Freestone, R. (2016). Revisiting place and placelessness. In R. Freestone, & E. Liu içinde (Eds.), *Place and placelessness revisited* (pp. 1–19). Routledge.

Lobo, T. (2021). The Techne and Poiesis of urban life-forms. In M. Nagenborg, T. Stone, M. González, & P. E. Vermaas içinde (Eds.), *Technology and the city: Towards a philosophy of urban technologies* (pp. 37–55). Springer.

Madanipour, A. (2003). *Public and private spaces of the city*. Routledge.

Memon, M. A., Ting, H., Cheah, J.-H., Thurasamy, R., Chuah, F., & Cham, T. H. (2020). Sample size for survey research: Review and recommendations. *Journal of Applied Structural Equation Modeling*, *4*(2), i–xx.

Meshi, D., Cotten, S. R., & Bender, A. R. (2020). Problematic social media use and perceived social isolation in older adults: A cross-sectional study. *Gerontology*, *66*(2), 160–168. https://doi.org/10.1159/000502577

Meydan, C. H., & Şeşen, H. (2015). *Yapısal Eşitlik modellemesi AMOS Uygulamaları (Structural Equation Modeling AMOS Applications)*. Detay Yayıncılık.

Montague, L. (2016). Theory's role in placelessness. In R. Freestone, & E. Liu içinde (Eds.), *Place and placelessness* (pp. 49–60). Routledge.

Moughtin, C. (2003). *Urban design: Street & Square*. Architectural Press.

Nasiri, M., Ukko, J., Saunila, M., & Rantala, T. (2020). Managing the digital supply chain: The role of smart technologies. *Technovation*, 96–97, 1–6. https://doi.org/10.1016/j.technovation.2020.102121

Özalp, B. (2022). Doğrulayıcı Faktör Analizi. In Ö. L. Antalyalı, & A. M. Alparslan içinde (Eds.), *Jamovi Uygulamalıİstatistik Analizleri* (pp. 115–133). Nobel.

O'Day, E. B., & Heimberg, R. G. (2021). Social media use, social anxiety, and loneliness: A systematic review. Computers in Human Behavior Reports, *3*, 1–13. https://doi.org/10.1016/j.chbr.2021.100070

Pariser, E. (2011). *The filter bubble: What the Internet is hiding from you*. Penguin.

Primack, B. A., Shensa, A., Sidani, J. E., Whaite, E. O., Lin, L. Y., Rosen, D., Colditz, J. B., Radovic, A., & Miller, E. (2017). Social media use and perceived social isolation among young adults in the U.S. *American Journal of Preventive Medicine*, *53*(1), 1–8. https://doi.org/10.1016/j.amepre.2017.01.010

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, *29*(4), 1841–1848. https://doi.org/10.1016/j.chb.2013.02.014

Przybylski, A. K., & Weinstein, N. (2013). Can you connect with me now? How the presence of mobile communication technology influences face-to-face conversation quality. *Journal of Social and Personal Relationships*, *30*(3), 237–246. https://doi.org/10.1177/0265407512453827

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.

Ratner, B. (2009). The correlation coefficient: Its values range between $+1/-1$, or do they? *Journal of Targeting Measurement and Analysis for Marketing*, *17*(2), 139–142. https://doi.org/10.1057/jt.2009.5

Ray, L. (2007). *Globalization and everyday life*. Routledge.

Reddy, L. J., & Yadav, K. K. (2023). Psychological effects of technology on college students. *Journal of Clinical Otorhinolaryngology, Head, and Neck Surgery*, *27*(1), 1805–1816.

Sennett, R. (1994). *Flesh and stone: The body and the city in Western Civilization*. London, UK: Faber & Faber.

Sennett, R. (2018). *Ten ve Taş: Batı Uygarlığında Beden ve şehir* [Flesh and stone: The Body and the city in Western civilization] (T. Birkan, Trans.). Metis.

Shaw, A. M., Timpano, K. R., Tran, T. B., & Joormann, J. (2015). Correlates of Facebook usage patterns: The relationship between passive Facebook use, social anxiety symptoms, and brooding. *Computers in Human Behavior*, *48*, 575–580. https://doi.org/10.1016/j.chb.2015.02.003

Statista. (2024). Number of internet and social media users worldwide as of April 2024. Statista. Retrieved July 10, 2024, from https://www.statista.com/statistics/617136/digital-population-worldwide/

Suhr, D. D. (2006). *Exploratory or confirmatory factor analysis*. SAS Institute.

Suler, J. (2004). The online disinhibition effect. *CyberPsychology & Behavior*, *7*(3), 321–326. https://doi.org/10.1089/1094931041291295

Tabachnick, B., & Fidell, L. S. (2020). *Çok Değişkenli İstatistiklerin Kullanımı*. Nobel Akademik Yayıncılık.

Tandoc, E. C., Ferrucci, P., & Duffy, M. (2015). Facebook use, envy, and depression among college students: Is Facebooking depressing? *Computers in Human Behavior*, *43*, 139–146. https://doi.org/10.1016/j.chb.2014.10.053

Tanjung, D. R., & Santosa, A. (2023). People, technology, and culture: Relationship transformation in the digital era. *International Journal of Students Education*, *1*(2), 271–274. https://journal.berpusi.co.id/index.php/IJoSE/article/view/428

Tarafdar, M., Gupta, A., & Turel, O. (2013). The dark side of information technology use. *Information Systems Journal*, *23*(3), 269–275. https://doi.org/10.1111/isj.12015

Technological Determinism. (2011). *D. Chandler, & Munday Rod içinde, A dictionary of Media and Communication*. Oxford University Press.

Thompson, B. (2008). *Foundations of behavioral statistics: An insight-based approach*. Guilford Press.

Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. Basic Books.

Vazquez, S. A., Madureira, A. M., Ostermann, F. O., & Pfeffer, K. (2023). The use of ICTs to support social participation in the planning, design and maintenance of public spaces in Latin America. *International Journal of Geo-Information*, *12*(6), 1–30. https://doi.org/10.3390/ijgi12060237

William, J. W., & White, A. (2020). *Digital minimalism in everyday life: Overcome technology addiction, declutter your mind, and reclaim your freedom*. Alakai Publishing LLC.

Wright, K. B., Rosenberg, J., Egbert, N., Ploeger, N. A., Bernard, D. R., & King, S. (2013). Communication competence, social support, and depression among college students: A model of Facebook and face-to-face support network influence. *Journal of Health Communication*, *18*(1), 41–57. https://doi.org/10.1080/10810730.2012.688250

Yang, C. C., Carter, M. D. K., Webb, J. J., & Holden, S. M. (2020). Developmentally salient psychosocial characteristics, rumination, and compulsive social media use during the transition to college. *Addiction Research & Theory*, *28*(5), 433–442. https://doi.org/10.1080/16066359.2019.1682137

Yaşlıoğlu, M. M. (2017). Sosyal Bilimlerde Faktör Analizi ve Geçerlilik: Keşfedici ve Doğrulayıcı Faktör Analizlerinin Kullanılması. *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, *46*, 74–85.

Zhang, X. X., Rost, D. H., Wang, J. L., & Reynolds, K. J. (2020). Active and passive social networking sites usage and negative emotions: A reciprocal relationship? *Journal of Social and Clinical Psychology*, *39*(3), 195–213. https://doi.org/10.1521/jscp.2020.39.3.195