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Exploring the relationships among fear of missing out (FoMO), sensation seeking and leisure activity participation

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ABSTRACT

Fear of missing out (FoMO) is a prominent phenomenon in the literature, and can play a significant role in activity participation behaviour of individuals. Although there are a growing number of studies exploring this phenomenon, the number of studies dealing with relationships among FoMO, sensation seeking, social media usage, and leisure activity participation is extremely limited. The basic aim of the study was to reveal the correlation between participation type and frequency in leisure activities with social media use habits, FoMO and sensation-seeking levels. Data were collected through an online survey method through a questionnaire about the type of activity attended in leisure time, frequency of participation, FoMO, sensation seeking and social media use habits. Data obtained from a sample of 1248 were analyzed. As a result of the corresponding analysis, individuals who frequently participate in leisure activities have higher FoMO and excitement seeking. According to the number of active friends on social media, a relationship was found between the frequency of social media usage, the status of that use, and the frequency of involvement in leisure activities. Likewise, it has been revealed that there are significant correlations between characteristics and the types and frequencies of engagement in leisure activities.

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Leisure preferences; fear of missing out; sensation seeking; social media use

Introduction

Technologies that are continually evolving and connected to the internet have transformed our behaviour. This change has occurred in positive and negative aspects. Researchers have had to use new naming and definitions for behaviours that have changed with the effect of technology. One of these is the concept of FoMO, which comes across as a concern that others have a better time with the constant updating of social media, which has become a part of daily life. Smartphones, which are the main reason for FoMO behaviour, have started to meet the different needs of people in many areas of life with the widespread use of internet today. People have succeeded in

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making their daily lives easier by loading several applications onto these devices. While 62.5% of the world's population has internet access, it appears 67.1% of this population use smartphones (DataReportal, 2022). In Türkiye, with population of nearly 85 million, 94% of the public (77.35 million people) use the internet (Turkish Statistical Institute, 2022). A glance at internet usage statistics reveals that the average daily time spent on social media by individuals is 2.25 h. Notably, the findings indicate that the daily average social media usage in Turkey exceeds the global norm, with a mean of 2.57 h per day. As can be noticed internet usage rates in Turkey are extremely high, and nearly every person spends as much time on social media as they do on their daily basic necessities. While 90.8% of Türkiye's population use the internet, 70.8% are active social media users. It was observed that 82.7% of the users regularly use the internet for social media (Turkish Statistical Institute, 2022).

A notable concept in recent times about identifying the psychological antecedents of excessive use of social media is fear of missing out (FoMO). Though FOMO has historical roots as a component of the way people behave (Hodkinson, 2019), the key factor contributing to its rising popularity in recent years has been the more frequent and severe experience of FOMO made possible by social media platforms (Przybylski et al., 2013). This phenomena, as explained in the Belongingness Theory (Baumeister & Leary, 1995) and the Information Foraging Theories (Muntinga & Taylor, 2018), is frequently used to explain why people utilize social media to satisfy their innate desire for social connection. This is an emerging area of research and is of increasing importance given the increasing use of social media. Indeed, Belongingness Theory explains that people have a pervasive urge to form and maintain at least a minimal amount of interpersonal relationships. The need to belong is an innate human motivation that drives most of our interpersonal behaviour (Baumeister & Leary, 1995, p. 497). High FoMO individuals desire continual social interaction and awareness of what others are doing (Franchina et al., 2018). FoMO has been identified as an explanatory variable in social media studies. For example, Alt (2015) indicated the positive association between FoMO and social media involvement. Wolniewicz et al. (2018) found that FoMO was positively associated with problematic smartphone use. People with a high FoMO are more likely to use their smartphone for social purposes, including social media, to stay connected to their social network (Roberts & David, 2020). Makki et al. (2018) found that the use of social media platforms was associated with individuals' innate desire to be accepted, and connected with others. FoMO appears to have a moderator role on the relationship between social media use and compliance (Akbari et al., 2021).

Tefertiller et al. (2020) proposed that in addition to the positive aspects of communication mediated by technology, it may have many negative impacts on human behaviour. Young and adult individuals who cannot be separated from the internet, and who feel severe discomfort and fear when the internet is absent are thought to experience many negative impacts physically and psychologically. Though there are many factors affecting FoMO of individuals, stimuli such as the leisure experiences of others and social media usage habits are among the subjects intensely studied in the literature with the FoMO concept. Individuals may feel they are missing other experiences due to the ability to instantaneously see social media shares and a person's ability to only be in one place at any time (Hayran et al., 2020). For this reason, the FoMO feeling emerges in the presence of social media and other rapid communication tools (Barry

& Wong, 2020; Elhai et al., 2020). People with high FoMO have a tendency to frequently check social network sites and this situation causes individuals to spend more time in the internet environment (Elhai et al., 2016).

Sensation seeking is another concept that our study reveals is closely related with FoMO. The personality trait of sensation seeking is the need for a variety of new, complex, and intense sensory inputs as well as a willingness to take risks in the physical, legal, and/or financial spheres in order to satisfy these needs (Zuckerman, 1994). FoMO, which is characterized as an anxiety condition by Reisenwitz and Fowler (2023), is the sense of having been “left behind” when one perceives people around them possessing or experiencing something rewarding that they do not. Sensation seeking, which is frequently examined in relation to motives behind engaging in risky leisure activities (Guszkowska & Bołdak, 2010; Hsieh, 2007), has also been found to have causal relationships with social media usage, which is often considered as a leisure activity (Brunborg et al., 2022). The most striking and common concept in the literature among the concepts of FoMO and sensation seeking is boredom. Bored individuals are more likely to think they are missing out on a rewarding experience because they are not having fun cognitively (Holte & Ferraro, 2020). Servidio (2021) stated that the proliferation of social media applications and the consequent increase in smartphone use have increased people’s awareness of the possibility of missing out on potentially exciting social experiences. Studies examining the relationship between sensation seeking and FoMO in the past have proven this relationship. For example, it has been observed that adolescents with high sensation seeking are prone to boredom and need new stimuli, so sensation seeking is associated with FoMO (Brunborg et al., 2022; Wang et al., 2019). Additionally, individuals are known to engage in exploratory risks to seek new experiences and acquire valuable information from those experiences (Khurana et al., 2018). When coping with any internet or social media activity, including boredom, sensation seeking is frequently linked to sentiments of anxiousness, jealousy, and envy. These emotions might be what triggers the onset of FoMO reactions. Sensation seeking can be understood as the need to experience new and different feelings and situations and the desire to seek ways to obtain these feelings (Hoyle et al., 2002).

The stimuli available in social media apps and their content, a part of smartphone use, may cause increased FoMO levels in people (Przybylski et al., 2013). Additionally, the frequency of a person’s social media use and individual traits are effective on FoMO (Barry & Wong, 2020). While social media use is usually regarded as a leisure activity, it is worth noting that individuals’ levels of FoMO might vary depending on their participation in other leisure activities, individual traits, and levels of sensation seeking. Though the associations between these concepts were revealed in the literature, the studies investigating these concepts with leisure activity types and demographic characteristics are very limited. According to these studies individuals with a high level of sensation seeking are more sensitive to the perception of boredom. They are afraid of being late or missing out on opportunities experienced by others because of their openness to new stimuli. Therefore, it is plausible to propose that sensation seeking and FoMO are interrelated. Furthermore, as individuals’ basic needs go unfulfilled, their feelings of FoMO tends to escalate. It can be said that there is a negative relationship between FoMO and well-being. However, it is claimed that FoMO improves social relations in some cases and does not negatively affect well-being (Roberts & David, 2020). To date,

there is no study in the literature examining the effect of FoMO on leisure behaviour by determining its relationship with sensation seeking and leisure participation. Studies have generally stated that FoMO is positively associated with social media use, whereas it is negatively associated with well-being (Reer et al., 2019). In the current study, it is thought that the increase in FoMO and sensation seeking will also encourage individuals to participate in leisure activities. It can be stated that the change between these variables will affect well-being positively.

In this context, a study considering FoMO, sensation-seeking levels, and social media use habits according to leisure activity type and participation frequency will fill an important gap in the literature. For this reason, the aim of the current study was to investigate the correlations between the leisure activity types and frequency of participation with social media use habits, demographic characteristics, FoMO and sensation-seeking levels.

Background literature and hypothesis

Fear of missing out (FoMO)

The concept of FoMO was introduced by Voboril in 2010, referring to emotions such as “the psychological state of deprivation in group relationships or the acceptance process involving feelings of inclusion in the group” (Argan & Argan, 2020). In addition, FoMO was brought up again by Przybylski et al. (2013) and a scale was developed to measure the phenomenon. The number of publications in the academic world related to the concept of FoMO has increased significantly with the effects of these developments in the literature and social media. In the last ten years, it was frequently included in the literature in studies related to social media and smartphone use, especially (Servidio, 2021; Tandon et al., 2022). With the current increase in social media use, the importance of FoMO, characterized by a desire to constantly stay in touch with and monitor what others are doing or experiencing, is continuously increasing.

The FoMO concept was defined by Przybylski et al. (2013) as “pervasive apprehension that others might be having rewarding experiences from which one is absent”. In other words, FoMO may be defined as a concern because the individual must miss an opportunity for a rewarding experience, social interaction, possession of a desired object, a profitable investment, or any other fulfilling occasion (Alt, 2015). Tandon et al. (2021) proposed that individuals experiencing FoMO may lead to engagement in persistent and deliberate interactions with others who are part of their online social group. FoMO may cause several negative feelings and emotions (Hunt et al., 2018). Individuals with high levels of sensation seeking are prone to boredom and need new stimuli, and research has shown that high levels of excitement seeking are associated with high FoMO (Brunborg et al., 2022).

In terms of psychological needs, the self-determination theory (SDT) may explain how FoMO is triggered by relationship needs, especially the need to belong, and how it directs people to spend time on social media. This theory developed by Ryan and Deci (2000a) contributes to the conceptualization of FoMO (Przybylski et al., 2013). According to SDT, basic psychological needs such as autonomy, competence and relatedness feed human motivation (Ryan & Deci, 2021). The need for autonomy is the perception that we determine according to our behaviours, goals and values (Ryan & Deci, 2000b). The need for competence involves achieving mastery in important areas of life, while

the need for affiliation refers to establishing relationships with and being cared for by others. Although basic psychological needs are universal, individuals' levels of satisfaction with these basic needs may differ (Ryan, 1995). Individuals reporting higher levels of FoMO have a tendency to be less satisfied in terms of basic psychological needs like competence, autonomy and relatedness (Przybylski et al., 2013). Furthermore, studies in the literature reveal that the increased satisfaction of basic psychological needs has positive effects on individuals (Schutte & Malouff, 2021; Van den Broeck et al., 2016).

Additionally, SDT is used by researchers to understand what may be triggered by FoMO (Elhai et al., 2020). The inability of an individual to meet these three psychological needs, forming the self-determination theory, may result in the negative mood of FoMO causing fear, concern, and anxiety (Przybylski et al., 2013). The usage of social media increases the sense of FoMO, and those who experience FoMO are more likely to use social media to get involved and try to fulfil their needs (Lee & Chiou, 2013). Along with the use of social media to evaluate leisure time, it also contributes to individuals who feel FoMO in matters such as being aware of leisure activities and buying tickets to participate in the event (Qiu et al., 2021). In this study, the FoMO concept is considered a psychological state caused by fear of missing out due to feeling that other people are enjoying an entertaining experience which the individual is not included in or concerns caused by being left out of an experience the individual considers important (Barker, 2016). It is known from previous studies that the intrinsic motivation of individuals participating in leisure activities increases (Lee & Ewert, 2019; Niven & Markland, 2016). For this reason, it is expected that FoMO levels of individuals participating in leisure activities will decrease with the satisfaction of basic psychological needs.

The concept of FoMO is linked with many features such as personality, self-concept, social identity (Reisenwitz & Fowler, 2023), consumer need for uniqueness, consumer independence (Argan et al., 2022) and may differ from person to person. Our study predicts that people with high FoMO are likely to be sensation seekers. We assume that people with higher sensation seeking tendencies are more prone to boredom and need new stimuli. Since the concept of FoMO is an emotion that triggers impulsive behaviour, it may cause consumption behaviour parallel to conformity behaviour (Argan et al., 2022; Kang et al., 2019). For this reason, it is expected that friends who participate in leisure activities would have the feeling of FoMO in order not to be deprived of the experience they have. In this study, sensation seeking is one of the factors that trigger the feeling of FoMO.

Sensation seeking

Sensation seeking is a personality trait defined as “the need for diverse new and complex sensations and experiences and the desire to take physical and social risks for these experiences” (Zuckerman, 1979). It is important to take into consideration the other areas that this concept is related to while discussing the phenomenon of sensation seeking. It is clear from the literature that Zuckerman carried out studies on an extensive number of subjects and connections linked to the concept of sensation seeking. It is underlined that there is a different perspective on this topic currently, and that the idea needs to be reviewed given the quick growth of technology advancements like virtual reality, the metaverse, and related experiences. Park and Stangl (2020) introduced the sensation seeking idea to augmented reality (AR) applications. Zuckerman and

Kuhlman (2000) expanded his research on sensation seeking and transferred it to a lab setting while presenting findings on its biological aspect. The model that underpins the explanation of sensation seeking in general is influenced by genetic, biochemical, psychophysiological, and social factors (Gerra et al., 1999). It is clear that a number of scholars have used the literature on sensation in order to explain multiple phenomena. Indeed, in a series of studies (2008, 2010, 2012) conducted by López-Bonilla and López-Bonilla, the applicability of sensation seeking aimed to explain internet usage, perceived innovation, and e-shopping behaviours. The necessity for varied complex sensations and experiences within the concept's unique nature highlights the need to develop the idea. While this circumstance was initially explained in terms of the biological aspect of the concept of sensation seeking, it can now be viewed as evidence of how the concept is handled, moving away from its traditional definition, and enabling new perspectives. As a matter of fact, today's changing and advancing social structures and technological developments have removed the concept from the limited lens of "alcohol use, use of other drugs, gambling, high-risk sports, and other forms of entertainment". Now, this concept continues to be used by developing different perspectives on the way the emerging structures are explained (Roberti, 2004). It has been argued that using the notion in its traditional sense is insufficient. In this context, our research seeks to expand and update the notion by addressing the relationship between sensation seeking and FoMO, which is heavily highlighted in social media use.

Individuals try to gain experience by participating in leisure activities to get away from the routine of their daily lives, to get away from reality, to have adventure and to relax (Iso-Ahola, 1999; Ryan & Deci, 2000b). This perspective is related to the four dimensions of sensation seeking (Zuckerman, 1994). In terms of sensation seeking level, high sensation seekers can be said to have a higher desire to both try very diverse activities and to repeat them compared to low sensation seekers. For this reason, high sensation seeking may cause more social media use (Dalbudak et al., 2015). Social learning theory can be used to explain the relationship between sensation seeking behaviour and participation in leisure activities. From this point of view, it can be thought that sensation-seeking levels of individuals may be due to the experiences of others or due to their own experiences (Stegman, 2010). As a matter of fact, this perspective underlines the relationship between sensation seeking, social media, and FoMO.

In our study, the features of the activities an individual participates in during leisure behaviour are considered important for their sensation-seeking levels. There was a direct correlation between sensation seeking and leisure experiences (Potts et al., 1996). For example, those with high sensation-seeking level had a tendency to participate in more diverse, adventurous, new and intense activities when choosing leisure activity types. Individuals with higher sensation seeking have a tendency to perceive an experience as being less risky than it is before they experience it for the first time (Zuckerman & Kuhlman, 2000). The impulsivity explaining this situation may be considered to involve rapid conversion to action without considering the outcome of the behaviour.

According to the literature above, individuals with different arousal and impulsivity levels may display differences in sensation-seeking levels. There may be situations where a person does not have the necessary time to be able to benefit from leisure activities with the aim of preserving their optimal arousal levels. The link between leisure moments and sensation seeking may be attributed to the individual's ideal arousal

state and their judgments of boredom (Iso-Ahola, 1999). However, the social media apps and interpersonal communication speed allowed by smartphones may serve the relevant purpose in less time (Leung, 2008). Currently, the social media apps on smartphones comprise an appropriate environment for individuals with high sensation seeking. In line with information obtained from the literature and based on the assumptions between concepts, a correlation may be considered between the sensation-seeking levels of individuals with their choice of leisure activities.

Leisure activity participation, social media use and demographics

Researchers stated that participation in leisure activities has important relationships with a variety of physical and psychological conditions (Kim, 2007; Park, 2007). Additionally, when social media use is associated with physical and psychological health, there is a need to better understand the correlations between social media use and leisure activities (Lepp et al., 2015). Smartphones are an important tool to plan leisure activities, obtain information about activities, and to share experiences before, during and after participation in activities (Allaby & Shannon, 2020; Karapanos et al., 2016). Fennell et al. (2019) stated that an important portion of smartphone use occurred during leisure and that smartphones were a leisure tool for adults. For this reason, the social media use habits of people are considered to be associated with their leisure participation choices. Based on the above discussions the following hypotheses were formulated:

H1. There are significant relationships among levels of FoMO, sensation seeking and leisure activity participation.

H2. There are significant relationships among social media usage (usage time, status and number of active friends) and leisure activity participation.

H3. There are significant relationships among leisure activity participation, gender, marital status, education and age.

Materials and methods

Participants

Based on the research aims and to test our hypotheses, data were collected with an online survey using the convenience sampling method from participants older than 18 years, who stated they had social media accounts and that they participate in various leisure activities for example, as indicated Table 2. Data were gathered during the pandemic, and Keller et al. (2023) reported that the isolation necessary by the pandemic enhanced people's feelings of loneliness. Restrictions on leisure time have limited people's leisure participation and opportunities to interact with each other (Takiguchi et al., 2023). The data were collected during COVID-19, which has been characterized with the above feelings and restrictions. The survey form was shared on social media platforms including Facebook pages, WhatsApp groups and Twitter, and additionally shared with participants by email. The participants were informed about the aim, scope and scientific content of the research and the condition of being an anonymous survey. Participants who wished to participate in the research were presented with a consent form on the first page of the online survey and were requested to consent using this form. Finally, people who voluntarily consented to participation answered the questions on

the online survey. The mean duration to respond to the survey was ten minutes. Responses of participants that were accepted as unusable due to invalid answers (empty, only partly completed, no demographic data) were removed from the sample and in conclusion the total number of useable participant responses was 1248.

Measures

The survey form used in the study comprised four sections. The first section was the 15-item of the Leisure Activity Scale (LAS) developed by Brajša-Žganec et al. (2011). The scale, which consists of 4 activity categories (cultural events, family and home activities, active socializing and going out) and choices of fifteen activity types (e.g. playing sports, going shopping and attending concerts) to determine the levels of respondents' participation in leisure activities. Sensation Seeking was measured using an 8-item scale (e.g. I would like to explore strange places and I would like to try bungee jumping) developed by Hoyle et al. (2002). The Brief Sensation Seeking Scale (BSSS) originally consists of 4 dimensions: experience seeking, boredom susceptibility, thrill and adventure seeking and disinhibition.

The third section of the survey comprised 10-items from the Fear of Missing Out Scale (FoMOs) which was validated by Przybylski et al. (2013). Examples of the items in FoMOs are "I fear others have more rewarding experiences than me", and "It bothers me when I miss an opportunity to meet up with friends". Except FoMOs, all items in the scales were measured on a 5-point Likert scale indicating level of agreement ranging from 1 = strongly disagree to 5 = strongly agree. The items on the FoMOs scale were evaluated on a 5-point Likert-type scale 1 (not at all true of me) to 5 (extremely true of me). The final section of the survey included questions to determine the demographic characteristics and social media use habits of participants. We performed validity and reliability analysis since data were collected in Turkish.

Data analysis

Before analysis, checks were made that data were accurately and fully entered and whether the data from the statements on the scales had normal distribution or not. Skewness values were between -1.307 and 1.629 , and kurtosis values were between -1.980 and 1.354 . Univariate normality was present as the values were lower than the recommended threshold values of ± 2 for skewness and ± 7 for kurtosis (Kim, 2013).

Data analysis in the study comprised three stages. The first step applied exploratory factor analysis to the leisure activity, sensation seeking and FoMO scales and examined the Cronbach alpha values for the factors. In the second stage, cluster analysis was used to categorize the leisure activity, sensation seeking and FoMO levels of participants. After determining the basic clustering dimensions, multiple corresponding analysis was used to investigate them. Multiple corresponding analysis techniques extract the basic dimensions using only a range of similarities about the objects or features provided by survey participants. Multiple corresponding analysis ensures cases are placed in a multidimensional space by using two or more dimensions based on variables representing the qualities of participants (Baggio & Klobas, 2011). In summary, multiple corresponding analysis is a technique based on comparison of objects. SPSS

24 was used to analyze data. Descriptive statistics were used to create the profile of the survey participants.

Results

Descriptive statistics

Among participants in the study, 53.8% were women, 61% were aged 18–25 years, 77.3% were single and 74.4% were university graduates. The demographic characteristics of participants are shown in [Table 1](#). Of participants, 44.4% had used social media for nine years or longer. The number of friends that participants actively communicated with on social media was 30 or less for 59.8% of participants. Of participants, 53.3% stated they were active social media users. Very few participants (6.3%) defined themselves as addicted ([Table 1](#)).

Leisure activity

Participants were asked which of fifteen leisure activities they participated in with which frequency and factor analysis was applied to the answers given in response to this scale. The scale had KMO value 0.792 and the Bartlett sphericity test result was chi-square 5585.658: $p = 0.000$. These values were at adequate levels to perform factor analysis. Four factors emerged as a result of factor analysis. The factor names and factor analyzes are shown in [Table 2](#). The four factors explained 55.123% of the total variance and all statements had reliability of 0.77.

All leisure activity factors were divided into three clusters as low, medium and high using the K-means technique. Cluster analysis determined the maximum and minimum score by noting the number of items in every factor. Additionally, the results of cluster analysis identified the mean score for each cluster and the number of

Table 1. Demographic characteristics and social media usage behaviour.

Variables group	Categories	f	%
Gender	Female	671	53.8
	Male	577	46.2
Marital status	Married	283	22.7
	Single	965	77.3
Age	18–25	762	61.0
	26–45	399	32.0
	46 and Older	87	7.0
Education level	High School or Less	221	17.7
	Undergraduate	928	74.4
	Postgraduate	99	7.9
Social media usage time	≤4 years	108	8.7
	5–6 years	260	20.8
	7–8 years	326	26.1
	≥9 years	554	44.4
Number of active friends on social media	≤30	746	59.8
	31–60	252	20.2
	≥61	250	20.0
Status of social media use	Passive	505	40.5
	Active	665	53.3
	Addicted	78	6.3

$n = 1248$.

Table 2. Factor analyzes of leisure activity, FoMO and sensation seeking.

	Factor loads	Eigenvalue	Explained variance (%)	C. Alpha
<i>Cultural Events</i>				
Going to the cinema	.574			
Going to the theatre	.794			
Visiting exhibitions	.757	2.351	15.671	0.69
Reading books	.634			
<i>Family and Home Activities</i>				
Going shopping	.744			
Visiting friends or relatives	.600			
Using social media	.640	2.140	15.269	0.57
Watching TV	.588			
<i>Going out</i>				
Attending concerts	.602			
Dining in restaurants	.579			
Going to bars or clubs	.801	1.915	12.766	0.67
<i>Active socializing</i>				
Playing sports	.741			
Attending sport events	.755			
Participating in trips	.426	1.863	12.417	0.62
Engaging in some particular hobby	.576			
Total explained variance: 55.123; Reliability of all scale items: 0.77				
<i>FoMO Scale</i>				
I fear others have more rewarding experiences than me.	.656			
I fear my friends have more rewarding experiences than me.	.683			
I get worried when I find out my friends are having fun without me.	.758			
I get anxious when I don't know what my friends are up to.	.719			
It is important that I understand my friends "in jokes".	.667	4.035	40.339	0.83
Sometimes, I wonder if I spend too much time keeping up with what is going on.	.557			
It bothers me when I miss an opportunity to meet up with friends.	.609			
When I have a good time it is important for me to share the details online (e.g. updating status).	.597			
When I miss out on a planned get-together it bothers me.	.449			
When I go on vacation, I continue to keep tabs on what my friends are doing.	.603			
<i>Sensation Seeking Scale</i>				
<i>Excitement and impulsivity</i>				
I like to do frightening things.	.809			
I would like to try bungee jumping.	.726			
I like wild parties.	.743	2.646	33.077	0.87
I would love to have new and exciting experiences, even if they are illegal.	.782			
<i>Experience Seeking-Boredom Susceptibility</i>				
I would like to explore strange places.	.793			
I would like to take off on a trip with no pre-planned routes or timetables.	.831	2.059	25.739	0.68
I get restless when I spend too much time at home.	.484			
I prefer friends who are excitingly unpredictable.	.573			

Total explained variance: 58.816%; Reliability for all scale items: 0.82.

participants in each cluster. Table 3 shows the cluster analysis results for all leisure activity factors. The cultural events factor contained four variables and had maximum points of 20 and minimum points of 4. The results of the analysis determined that 143 participants had high levels, 580 participants had medium levels and 458 participants had low levels. When the mean scores for participants is examined, the high level score was identified as 11.50, medium level score was 6.72 and low level score was 2.70.

Table 3. Leisure activity, FoMO and sensation seeking levels of respondents.

		<i>n</i>	%	Mean score
Cluster for Cultural Events	Cluster 1 High Level	143	12.1	11.50
	Cluster 2 Medium Level	580	49.1	6.72
	Cluster 3 Low Level	458	38.8	2.70
Cluster for Family and Home Activities	Cluster 1 High Level	468	37.7	13.63
	Cluster 2 Medium Level	561	45.2	9.50
	Cluster 3 Low Level	213	17.1	5.80
Cluster for Going out	Cluster 1 High Level	341	28.0	10.24
	Cluster 2 Medium Level	520	42.7	6.60
	Cluster 3 Low Level	358	29.4	2.96
Cluster for Active Socializing	Cluster 1 High Level	247	20.1	13.46
	Cluster 2 Medium Level	564	45.9	8.82
	Cluster 3 Low Level	417	34.0	4.41
Cluster for FoMO	Cluster 1 High Level	206	16.5	39.89
	Cluster 2 Medium Level	615	49.3	28.61
	Cluster 3 Low Level	427	34.2	18.64
Excitement and Impulsivity	Cluster 1 High Level	435	34.9	17.49
	Cluster 2 Medium Level	488	39.1	11.59
	Cluster 3 Low Level	325	26.0	5.71
Experience Seeking-Boredom Susceptibility	Cluster 1 High Level	724	58.0	18.04
	Cluster 2 Medium Level	406	32.5	13.49
	Cluster 3 Low Level	118	9.5	8.08

The family and home activities factor containing four variables had peak points of 20 and minimum points of 4. As a result of cluster analysis (K-means techniques), 468 participants had high levels with mean points of 13.63, 561 participants had medium levels with mean points of 9.50 and finally 213 participants had low level with mean points of 5.80. The three-variable going out factor had highest points identified as 15 and lowest points of 3. Cluster analysis results found 341 participants were in the high cluster with mean score 10.24, 520 participants were in the medium cluster with mean score 6.60 and 358 participants were in the low cluster with mean score 2.96. For the active socializing factor, the highest points were 20 and lowest points were 4. The results of cluster analysis found 247 respondents were in the high cluster with mean score 13.46, 564 respondents were in the medium cluster with mean score 8.82 and 417 respondents were in the low cluster with mean score 4.41.

Factor and cluster analyses of foMO

Factor analysis was applied to ten statements on the FoMO scale and the scale had KMO value 0.85 = 41 and Bartlett sphericity test result chi-square 5374.750: $p = 000$. The explained variance was 40.34% and reliability value was 0.83 (Table 2).

For the ten statements on the FoMO scale, the highest score was 50 and lowest score was 10. After determining the total scores for each participant, the participants were divided into three clusters with the K-means technique. As a result of cluster analysis, 206 participants were at high level with mean points of 38.89, 615 participants were at medium level with mean points of 28.61 and 427 participants were at low level with mean points of 18.64.

The frequency, percentages, and mean scores of participants according to their FoMO levels are shown in Table 3.

Sensation seeking factor and cluster analysis

Exploratory factor analysis for the eight statements included on the sensation seeking scale found two factors. The first factor comprised four statements involving excitement and impulsive behaviour and was called excitement and impulsivity. This factor explained 33.07% and had Cronbach alpha value of 0.87. The second factor comprised four statements and was named experience seeking-boredom susceptibility. This factor explained 25.74% and had Cronbach alpha value of 0.68 (Table 2).

Cluster analysis was applied to participants for the excitement and impulsivity and experience seeking-boredom susceptibility factors. The results of cluster analysis are shown in Table 3. Both of the factors of excitement and impulsivity and experience seeking-boredom susceptibility comprise four variables and both had highest score of 20 and lowest score of 5. After calculating the total score for each participant, cluster analysis performed with the K-means technique and three clusters were identified in each factor. Cluster analysis of the excitement and impulsivity factor found 435 participants were in the high level cluster with mean score 17.49, 488 participants were in the medium cluster with mean score 11.59 and finally 325 participants were in the low cluster with mean score 5.71. Cluster analysis of the experience seeking-boredom susceptibility factor found 724 people were included in the high cluster with mean score 18.04, the medium cluster had mean score of 13.49 and 118 participants had mean score of 8.08.

Correspondence analysis between recreational activity factors and variables

Multiple correspondence analysis was performed to see the relationship among FoMO sensation seeking and leisure activity participation. The analysis indicated that FoMO was explained under two dimensions. Dimension 1 explained 33.36% of the variance with the inertia value of .334. Further, Dimension 2 explained 19.88% with the inertia value of .199. Inertia value greater than 0 (.334 and .199) indicates a relationship between the row and the column, supports hypothesis 1. Therefore, the two dimensions explained 53.25% of the variance in total with an inertia value of .533.

Leisure activity, FoMO and sensation seeking factors appeared to cluster in a single dimension. However, each of the leisure activity factors (high, medium, low) appeared to have an association representing an important relationship with FoMO and sensation-seeking factors. The graph in Figure 1 shows that participants with high participation in all types of leisure activity appeared to have high levels of FoMO and excitement-impulsivity/experience-boredom.

Second multiple correspondence analysis was employed to reveal the relationship between clusters of leisure activity. Dimension 1 comprised the variables of active friends on social media and status of social media use, and Dimension 2 comprised social media usage time. As such, Dimension 1 explained 28.80% of the variance with an inertia value of .288 and Dimension 2 explained 18% of the variance with an inertia value of .180. These inertia values were in support to hypothesis 2. These dimensions explained 46.84% of the variance in total. As can be seen in Figure 2, participants who used social media passively, had active friend numbers of 30 or lower, and spent 5–6 h daily on social media rarely participated in all leisure activities. Participants defining themselves as active users of social media, those with 31–60 active friends and spending

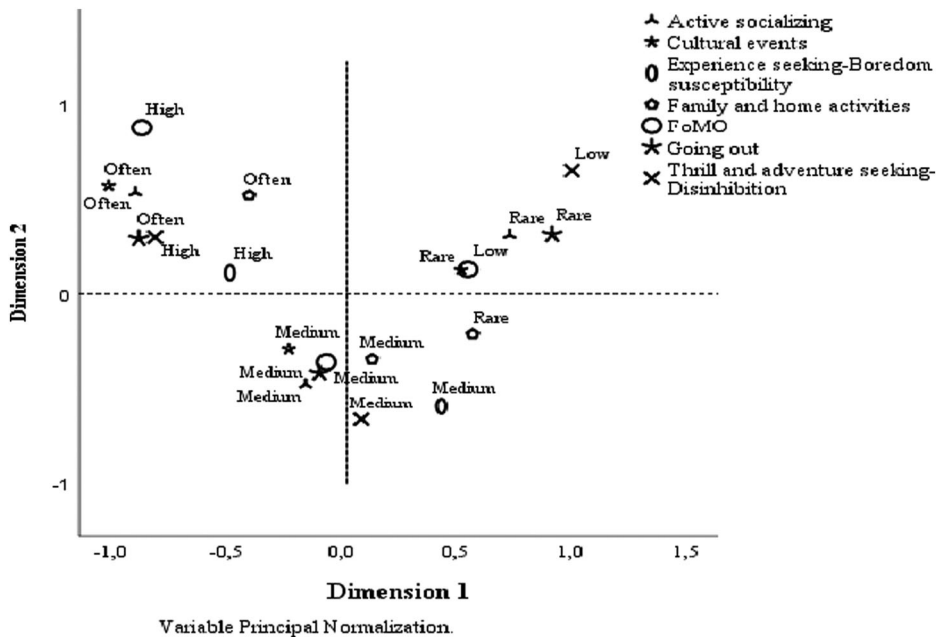


Figure 1. Relationships among FoMO, sensation seeking and leisure activity participation.

7–8 h on social media had moderate levels of participation in the leisure activity types. Additionally, participants using social media actively, with 61 or more friends, and spending more than 9 h on social media frequently participated in leisure activity types. Moreover, it was found that there was no correlation between addicted users, those using social media for 4 h or less and leisure activity type clusters.

Additionally, multiple correspondence analysis was employed to reveal the relationship between clusters of leisure activity (Dimension 2). Dimension 1 comprised the variables of age, gender, marital status, and education. As such, Dimension 1 explained 27.60% of the variance with an inertia value of .276 and Dimension 2 explained 19% of the variance with an inertia value of .194. The inertia results supported hypothesis 3. These dimensions explained 46.70% of the variance in total. As can be seen in Figure 3, participants who were aged 18–25 years, male, single and university graduates had medium participation in all leisure activities, while participants who were 26–45 year-old, female, single and postgraduates had high participation in family and home activities and medium participation in other activities. Generally, single men and women had medium levels of participation in leisure activities. 46-year-old married respondents indicated that they did not participate in leisure activities, or they rarely participate. In addition, family and home activities were the activity type in which male participants participate the least, unlike women.

Discussion

The present study examined relationship between leisure activity types and frequency of participation with social media use habits, demographic characteristics, FoMO and

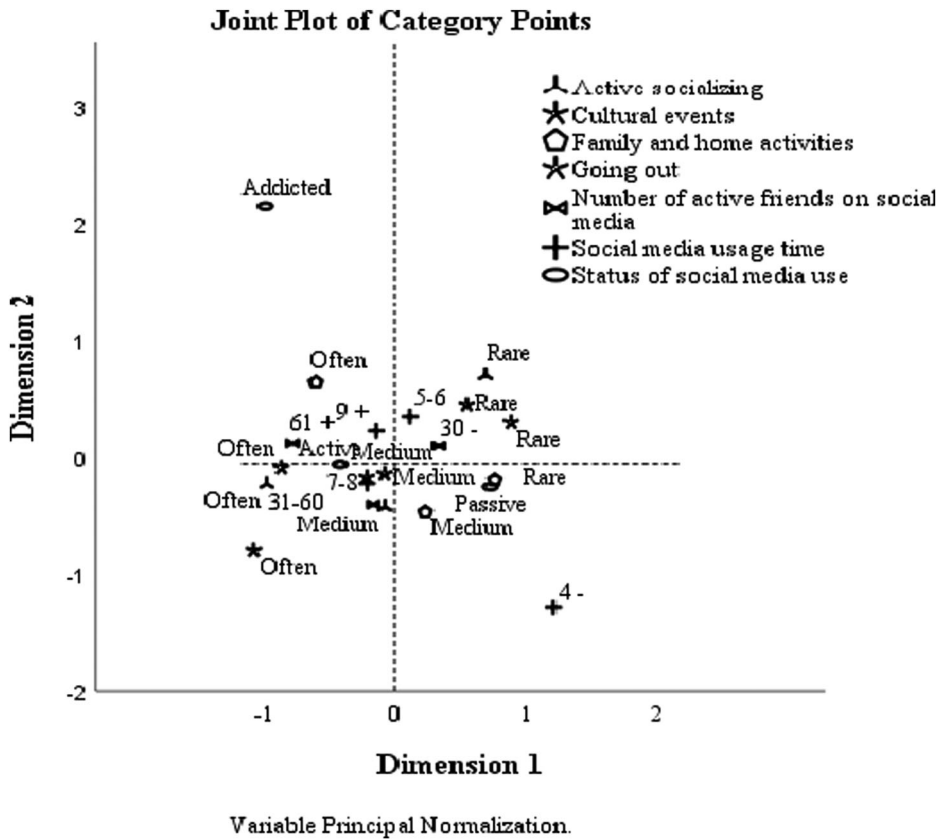
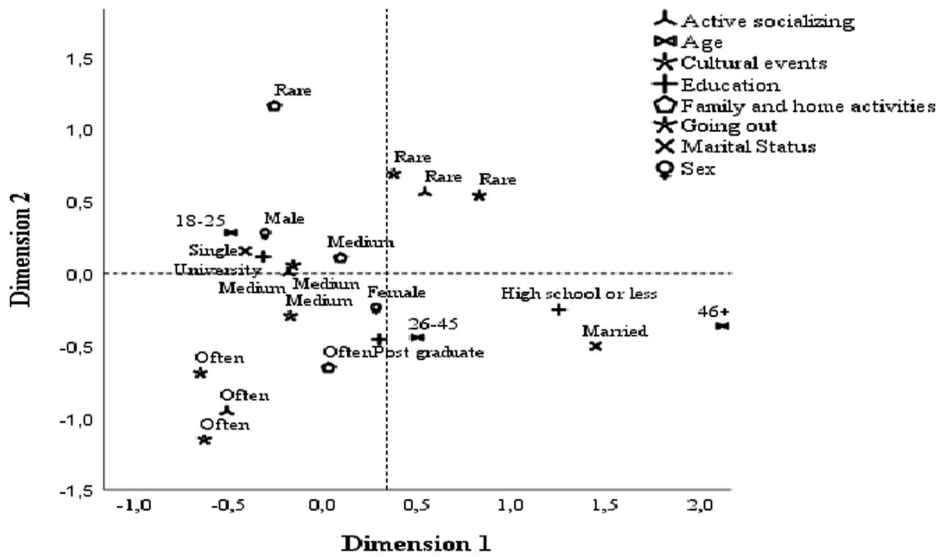


Figure 2. Relationships among social media usage (usage time, status and number of active friends) and leisure activity participation.

sensation-seeking levels. In the literature, individuals with high sensation seeking were determined to experience a feeling of FoMO (Wang et al., 2019); social media apps affected sensation seeking and FoMO (Leung, 2008); and smartphone use was a leisure assessment tool (Fennell et al., 2019). For this reason, the study was completed by considering that personal characteristics, leisure activity types and levels may be affected by FoMO and sensation seeking based on the available literature. The research’s conclusions will put into context future studies’ ideas about the variables affecting sensation seeking and FoMO (such like activity type, gender, and social media use). Finally, this study partially mirrors the effects found in earlier focus structure research; this mirroring can be regarded as data validation.

Firstly, the reliability for the sample group was ensured by examining the exploratory factor analysis and Cronbach alpha values of the scales used to collect data in the study (leisure activity scale, sensation seeking and FoMO). Later, with the purpose of serving the aim of the study, cluster analysis was used to determine relationships between variables. Fit analysis was performed for data obtained in line with the aims and an attempt is made to explain the results obtained with support from the literature.

According to the first hypothesis in our study, there are significant relationships among levels of FoMO, sensation seeking and leisure activity participation. In this



Variable Principal Normalization.

Figure 3. Relationships among leisure activity participation, gender, marital status, education and age.

context, the first hypothesis in the study was confirmed. Individuals with high participation in leisure activity types appeared to have high FoMO levels. As is known, FoMO is affected by the features of the social environment (Roberts & David, 2020) and can stimulate behaviour by increasing observing others and encouraging people to follow mainstream trends (Kang & Ma, 2020). People with high FoMO have a tendency to frequently check social network sites. This situation causes individuals to spend more time in internet environments (Elhai et al., 2016). As a result, it is common for individuals to become aware of other people engaging in leisure activities and to become more willing to engage in the activities that interest them.

Especially in the present day, the stimuli in social media apps and content, a part of smartphone use easing access to social media, have caused an increase in FoMO levels of people (Przybylski et al., 2013). As FoMO level increases, individuals increase activity participation levels with the desire to mimic the activities of others and experience the same activities.

Participants with high excitement-impulsivity/experience-boredom levels were identified to have high participation in different types of leisure activities. When this result of the study is associated with the literature, individuals with high levels of sensation seeking are known to be more susceptible to new stimuli (Zuckerman, 1994). For this reason, they are more afraid of missing rewarding opportunities experienced by others. According to Wang et al. (2019), individuals with high sensation-seeking tendencies require more arousal and for this reason experience FoMO in relation to opportunities providing new experiences. Individuals with high sensation-seeking levels participate in adventurous, more diverse, intense activities and innovative activities in their choice of leisure activity type (Potts et al., 1996).

According to the second hypothesis in the study, there are significant relationships among social media usage (usage time, status and number of active friends) and leisure activity participation. The second hypothesis in the study was confirmed. Social media apps provide users with the opportunity to share their activities with others and see what others are doing in real time. For this reason, social media platforms increase the FoMO on some things for some individuals and the person's participation level in social media activities or personality traits may be effective (Barry & Wong, 2020). Participants who use social media passively, have low numbers of active friends, and spend 5–6 h daily on social media rarely participate in all leisure activities. Participants describing themselves as active users of social media, with high active friend numbers and spending nearly one third of the day on social media were determined to have medium levels of participation in leisure activity types. Additionally, participants using social media actively, spending more than 9 h a day on social media and with 61 or more active friends on social media appeared to frequently participate in leisure activity types.

According to the final hypothesis in our study, there are significant relationships among leisure activity participation, gender, marital status, education and age. Previous studies revealed that creation, definition and experience of leisure is related to the personality of the individual (Hills & Argyle, 1998; Lawton, 1994; Tinsley et al., 1993). Participation choices in leisure activities are considered to be a reflection and extension of our individual traits. Diener et al. (1984) stated that the individual's personality affected behaviour and experiences in certain periods. Compared with other contexts, they confirmed that personality traits are more likely to influence an individual's choice of activity and environment during leisure time. Results supporting our study were reached in the relevant literature. Male participants aged 18–25 years, who were single, and university graduates had medium levels of participation in leisure activity. The diversity of activities, larger social environment and daily time availability of young male participants in the Turkish sample are considered to emerge as a result of having more cultural freedom compared to women. However, it is known that there are differences from culture to culture and country to country when leisure participation is assessed in terms of sex; hence, it should be stated that there is no consensus in the literature about these differences (Yerkes et al., 2020).

Our study additionally observed that single female participants aged 26–45 years with postgraduate education participated in family and home activities often and other activities at medium level. The 26–45-year age group is the period when marriage decisions are made or when peers may be married, and this is thought to limit inclusion in social activities. This situation may direct women towards family and home activities. This result emerging in our study may be assessed as a reflection of the social life in Turkey in terms of women and men. The literature is parallel to the obtained result (Hassing, 2020). According to research findings, males have more leisure time accessible to them, however women report more positive leisure experiences and gain more enjoyment from their leisure activities than men (Codina & Pestana, 2019). Additionally, Kooij et al. (2018) revealed that men focus on the work concept in their perspectives about the future, while women focus on different targets related to family and leisure. They emphasized that the gender variable may explain the leisure participation choices of individuals. When assessed independent of gender, female participants had

medium levels of leisure participation. For this medium participation in leisure activities, considering the effect of the age variable, starting work in a profession or newly beginning and the effect of the available financial means may create limitations on leisure participation of individuals (Gratton & Taylor, 2000).

The high levels of FoMO among the participants of the study could also be attributed to the restrictions imposed by COVID-19. The imposed home stay could have reinforced the need to participate in FoMO activities with high levels of excitement and impulsivity to alleviate boredom, and engage in the sensation seeking behaviour. Similarly, the possibility of significant correlations between social media use (duration of use, status, and the number of active friends) and involvement in leisure activities could also be attributed to the pandemic. Our study revealed significant relationships between engagement in leisure activities and gender, marital status, and education levels across different age groups, except for participants aged 65 and older. This exception could be ascribed to the enforced isolation imposed on elderly people in Turkey during COVID-19.

Conclusion

Following conclusions are drawn considering the study's findings. The study concludes that the vast majority of the participants engage in cultural, family-home, going-out, and active socializing activities at a moderate level. While the majority of the participants have a medium level of FoMO, their sensation seeking is at a high level. However, when evaluated in terms of participation in leisure activities, it can be stated that those who frequently participate in leisure activities have a high level of FoMO and sensation seeking. The high level of FoMO and sensation seeking can be interpreted as causing individuals to spend more time on the internet. This indicates that the relationship between FoMO and sensation seeking is not unidirectional and is influenced by many variables. Leisure engagement was average among people who were single. Additionally, family and home activities were the activity type that men participated the least, unlike women. When leisure activity is compared on a gender basis, it becomes clear that women and men in Turkey have different preferences for social interaction. Leisure in Turkey is traditionally seen among women as spending time at home with friends or family members without worrying about doing certain activities. Men, on the other hand, favour spending more of their leisure moments away from the house. As the FoMO levels increased, individuals engaged in more activities out of a desire to emulate what others are doing and to have their own similar experiences. As shown in the study active social media users who spend roughly a third of their day online and have a large number of active friends engage in modest amounts of leisure activities. Further it is concluded that the middle-aged single female participants with postgraduate education frequently participated in family-home activities and moderately participated in other activities.

The recent study not only contributes to our understanding of the subject matter but also carries profound theoretical implications. Above all, the research adds to the existing body of understanding regarding FoMO, social media, leisure involvement and sensation seeking. It is possible to state that the results of the study make contributions to expanding the concept of sensation seeking and handling the phenomenon in the context of new

experiences. Although sensation seeking is expressed as the need for various new and complex sensations and experiences, social media and technology-based user experiences reveal that the concept should be handled and updated from a different perspective. In the current study, revealing the relationship between sensation seeking and FoMO provides theoretical implications for addressing the concept and its meaning in a changing and transforming world.

Limitations and Future Research

In addition to providing theoretical and empirical inferences, the results of this study have the quality of providing predictions for leisure activity planners and within the sector. Sensation seeking and FoMO concepts, with serious correlation with leisure activity types and levels and impact on individuals, offer the opportunity for inferences which will be effective in the activity marketing process (Furnham, 2004; Hodgkinson, 2019;). Additionally, the results of the study are important for creating and marketing leisure activities. The results of the study may be used in areas like diversifying the desired message content and developing advertising and creating and individualizing activity invitations.

However as with any other research, this study comes with limitations as well. The first limitation comes from the target sample for data collection in this study. While the findings of this study provide a significant breakthrough about the role of leisure participation types and levels, the data were collected from a broad age interval. Hence, the effect of age interval or studies performed by reducing the sample group more specifically may differ in other contexts. Secondly, an inability to generalize the results is the primary disadvantages of convenience sampling. Thus, in future studies, probability sampling method can be used if research conditions are suitable to reduce such bias. Another important issue related to sample is that the data collection took place during the COVID-19 pandemic when a lot of events were cancelled both in Turkey and globally. Respondents were requested to provide their responses based on the activities they engaged in previous to the onset of the pandemic. This circumstance needs to be assessed as a study limitation that should be taken into account. Since social media use and engagement in leisure activities might have been impacted by COVID-19, it would be useful to conduct similar studies in regular times in the future.

Furthermore, additional sample limitations include a lack of cultural diversity. The use of additional variables (e.g. well-being, nomophobia, type of social media apps actively used) can strengthen the findings of this study. Therefore, this study suggests future research should collect data from diverse groups and conduct a multilevel analysis to avoid bias derived from common characteristics of each group. Finally, we adopted the LAS which was originally developed by Brajša-Žganec et al. (2011) and the scale did not include items to assess casual video gaming or e-sports as common leisure activities nowadays. In future studies, it is recommended to use actual leisure activities including video gaming, e-sports, virtual reality gaming and metaverse activities. In addition to sensation seeking and FoMO related studies, comparisons of “edgework”, “heterotopia”, ‘limit experiences’, “liminality”, “abnormal leisure”, “devotional leisure” with risky or marginal activities will draw a useful framework to see the whole picture.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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