

Outdoor Adventure Recreation: The Mediating Role of Flow Experience in the Relationship Between Adventure Behavior Seeking and Leisure Satisfaction

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Abstract

This study examines the relationships among adventure behavior seeking, recreational flow experience, and leisure satisfaction in the context of outdoor adventure recreation. Although it is widely accepted that outdoor recreation supports physical, psychological, and social well-being, research on the psychological mechanisms by which high-risk and challenging experiences transform into satisfying leisure outcomes is limited. This study aims to fill this gap by investigating the mediating role of a psychological state known as flow experience in the relationship between individuals' tendencies toward adventure seeking and leisure satisfaction. Within the scope of the research, data collected through surveys from 1,340 individuals participating in various outdoor recreation activities such as mountaineering, diving, paragliding, skiing, rafting, hiking, and camping at 142 centers located in 50 different provinces of Turkey were analyzed. Six hypotheses developed based on the literature of sensation seeking, flow theory, and leisure studies were tested using Structural Equation Modeling (SEM). This study proposes a theory-based structural model to rationalize the tested structural relationships. The results indicate that the hypotheses are supported. The findings reveal that adventure behavior seeking positively and significantly affects both recreational flow experience and leisure satisfaction. Moreover, it was determined that flow experience directly increases leisure satisfaction. The most striking finding is that flow experience fully mediates the relationship between adventure behavior seeking and leisure satisfaction. Flow experience, characterized by intense concentration, intrinsic motivation, a sense of control, and action-awareness merging, provides a psychological pathway to understanding how individuals derive satisfaction from risky and physically demanding activities. Consequently, it shows that adventure seeking has not only a direct effect on leisure satisfaction but also an indirect effect through flow experience. Thus, the proposed recreational flow experience model is found to be effective. This situation contributes significantly to understanding the effects of outdoor recreation on individuals' psychological well-being. Accordingly, it confirms that adventure behavior seeking, recreational flow experience, and leisure satisfaction can have important outcomes in natural environments. Based on the findings, it is recommended to promote adventure-based programs that encourage flow, increase access to outdoor recreation for disadvantaged or low-income groups, and integrate flow-focused activities into education and urban recreation planning. Additionally, outdoor recreation activities are recommended to be designed in a way that enhances both participants' adventure interaction and flow experience. In this context, adventure behavior seeking and recreational flow experience are shown to be important for the leisure satisfaction of individuals participating in outdoor recreation activities. In an era marked by increasing urbanization, stress, and disconnection from nature, understanding how adventure and psychological immersion together enhance leisure satisfaction is critically important for building healthier and more nature-connected communities.

Keywords: Outdoor recreation, Adventure seeking, Flow experience, Leisure satisfaction

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Açık Alan Macera Rekreasyonu: Macera Davranışı Arayışı ve Serbest Zaman Tatmini Arasındaki İlişkide Akış Deneyiminin Aracı Rolü

Özet

Bu çalışma, açık alan macera rekreasyonu bağlamında, macera davranışı arayışı, rekreasyonel akış deneyimi ve serbest zaman tatmini arasındaki ilişkileri incelemektedir. Açık alan rekreasyonunun fiziksel, psikolojik ve sosyal iyilik hâlini desteklediği yaygın olarak kabul edilmekle birlikte, yüksek riskli ve zorlu deneyimlerin tatmin edici serbest zaman çıktısına nasıl dönüştüğüne dair psikolojik mekanizmalar üzerine yapılan araştırmalar sınırlıdır. Bu çalışma, bireylerin macera arayışına yönelik eğilimleri ile serbest zaman tatmini arasındaki ilişkide akış deneyimi olarak bilinen psikolojik bir durumun aracı rolünü araştırarak bu boşluğu doldurmayı amaçlamaktadır. Araştırma kapsamında, Türkiye'nin 50 farklı ilinde yer alan 142 merkezde dağcılık, dalış, yamaç paraşütü, kayak, rafting, doğa yürüyüşü ve kampçılık gibi çeşitli açık alan rekreasyon faaliyetlerine katılan 1.340 bireyden anketlerle toplanan veriler analiz edilmiştir. Duyumsal arayış, akış kuramı ve serbest zaman çalışmaları literatürüne dayalı olarak geliştirilen altı hipotez, Yapısal Eşitlik Modellemesi (YEM) ile test edilmiştir. Bu çalışma, test edilen yapısal ilişkileri rasyonalize etmek için teori tabanlı bir yapısal model önermektedir. Sonuçlar, hipotezlerin desteklendiğini göstermektedir. Elde edilen bulgular, macera davranışı arayışının hem rekreasyonel akış deneyimini hem de serbest zaman tatminini olumlu ve anlamlı düzeyde etkilediğini ortaya koymuştur. Ayrıca, akış deneyiminin doğrudan serbest zaman tatminini artırdığı belirlenmiştir. En dikkat çekici bulgu, akış deneyiminin macera davranışı arayışı ile serbest zaman tatmini arasındaki ilişkiyi tamamen aracılık etmesidir. Yoğun dikkat, içsel motivasyon, kontrol hissi ve eylemle farkındalığın birleşmesiyle karakterize edilen akış deneyimi; bireylerin riskli ve fiziksel açıdan zorlayıcı etkinliklerden nasıl tatmin elde ettiklerine dair psikolojik bir yol sunmaktadır. Sonuç olarak; macera arayışının serbest zaman tatmini üzerinde yalnızca doğrudan değil, aynı zamanda akış deneyimi aracılığıyla dolaylı bir etkisinin de olduğunu göstermektedir. Böylelikle, kurgulanan rekreasyonel akış deneyimi modelinin çalıştığı tespit edilmiştir. Bu durum, açık alan rekreasyonunun bireylerin psikolojik iyi oluşuna etkilerini anlamada önemli bir katkı sunmaktadır. Buna bağlı olarak, macera davranışı arayışının, rekreasyonel akışı deneyiminin ve serbest zaman tatmininin doğal ortamlarda önemli sonuçlara sahip olabileceğini doğrulamaktadır. Bulgulara dayanarak, akışı teşvik eden macera temelli programların yaygınlaştırılması, dezavantajlı veya düşük gelirli grupların açık alan rekreasyonuna erişiminin artırılması ve eğitim ile kentsel rekreasyon planlamasına akış odaklı etkinliklerin entegre edilmesi önerilmektedir. Ayrıca açık alan rekreasyonu aktivitelerinin, katılımcıların hem macera etkileşimini artıracak hem de akış deneyimini teşvik edecek şekilde tasarlanması önerilmektedir. Bu bağlamda, macera davranışı arayışının ve rekreasyonel akışı deneyiminin, açık alan rekreasyon aktivitelerine katılan bireylerin serbest zaman tatmini için önemli olduğunu göstermektedir. Artan kentleşme, stres ve doğadan kopuşun yaşandığı günümüzde, macera ve psikolojik derinleşmenin serbest zaman tatminini birlikte nasıl artırdığını anlamak; daha sağlıklı ve doğayla daha bağlantılı toplumlar inşa etmek için kritik öneme sahiptir.

Anahtar Kelimeler: Açık alan rekreasyonu, Macera arayışı, Akış deneyimi, Serbest zaman tatmini

Introduction

Outdoor recreation emerged as a distinct field of study in the 1950s, driven by the rapid increase in economic prosperity, the development of transportation opportunities, the rise in leisure time, and other social factors (Manning, 1999). Throughout history, outdoor recreation has shaped human-environment relationships and has been an integral part of many cultures and economies (Tuula & Martin, 2013). In this context, outdoor activities appear as a unique human endeavor that has long been examined from various perspectives and within different discourses (MacHovec, 2015). Fundamentally, outdoor recreation is a leisure pursuit that involves interaction with, appreciation of, or experience in the natural environment and is indispensable for leisure experiences in natural settings (Guthrie et al., 2012). Outdoor recreation provides individuals with various benefits toward health and well-being while also facilitating interaction with natural environments (Colley et al., 2019); at the same time, it represents an ideal and appealing combination of physical activity and exercise (Stranavska & Görner, 2017).

When outdoor recreation involves excitement, perceived risk, or physically challenging situations, it is also referred to as adventure recreation and is undertaken by individuals or groups for physical and/or social benefits (Huddart & Stott, 2019). Today, outdoor recreation is presented as a means of returning to nature, connecting with nature, and promoting environmental concerns and behaviors (Teisl & O'Brien, 2003; Junot et al., 2017). At present, the vast majority of people live in urban areas, and this proportion is expected to increase in the coming years. Urbanization is a factor that negatively affects social, economic, and mental health (Ventriglio et al., 2021). Social inequalities, social insecurity, differences, and the lack of innate contact with nature are known to be among the causes of mental health problems (Percudani et al., 2024). In this context, outdoor recreation, which is based on a relational approach to nature, stands out in terms of increasing mental health satisfaction and supporting an alternative leisure activity (Karacaoğlu, 2024; Puhakka, 2021; Yaşartürk et al., 2024).

Access to outdoor is also considered an important resource in terms of public health. Spending time in outdoor is important for avoiding social isolation, engaging in physical activities, playing games in open areas, or simply experiencing a change of scenery and getting fresh air (Ward Thompson & Aspinall, 2011). The relationship between outdoor recreation and public health has become increasingly recognized, and the provision of recreational spaces is seen as a means to enhance physical activity and improve public health, while also being directly related to physical activity (Dahmann et al., 2010; Koppen et al., 2014). Outdoor recreation provides significant recreational ecosystem services (such as stress relief, socialization, appreciation of nature, etc.) through physical interaction with the natural world, and has served as an important coping mechanism for people during times of crisis or disaster (Rice et al., 2020). In particular, during the ongoing COVID-19

pandemic, interest in biologically based outdoor recreation activities has increased; nature groups, camping, and adventure-oriented activities such as mountaineering have regained individual and societal value (Rice & Pan, 2021). Various studies indicate that outdoor recreation has increased since the outbreak of the pandemic (Hansen et al., 2023; Pröbstl-Haider et al., 2023; Taff et al., 2021). In this context, it can be said that outdoor recreation activities contributed to the reduction of individuals' stress levels, the maintenance of physical fitness, and the improvement of mental health during the COVID-19 period (Beery et al., 2021; Landry et al., 2021).

Outdoor recreation is not limited solely to physical activity; it is also a multidimensional field with psychological depth that contributes to self-actualization and enhances quality of life (Feng et al., 2025; Lisauskienė & Leščinskij, 2025). In this context, it can be said that outdoor recreation holds significant importance for human health both individually and socially (Zwart & Ewert, 2022). In recent years, studies focusing on the multidimensional structure of outdoor recreation have come to the fore. This multidimensionality is also reflected in individuals' motivations to participate in outdoor recreation. In particular, the flow experience offers various opportunities and experiences in outdoor recreation for people of different age groups and interests. Flow is defined as a subjective state in which individuals become fully immersed in an activity, forgetting fatigue and everything outside of the activity (Csikszentmihalyi, 2014). Conditions that enable flow include having clear goals and expectations for everything we do, paying attention to the outcomes of our actions, adjusting our skills to the opportunities for action in the environment, and focusing on the task at hand without distraction. These simple rules can make a significant difference. Flow activities lead to personal development because maintaining the flow state requires developing skills that correspond to increasing challenges (Csikszentmihalyi, 1996). Flow involves being fully present and utilizing one's entire capacity. Since flow is inherently pleasurable, people continuously try to return to this state, which inevitably brings about the pursuit of greater challenges (Csikszentmihalyi & Hermanson, 1995). The flow experience consists of the following nine dimensions: a balance between challenge and skills, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task, a sense of control, loss of self-consciousness, transformation of time, and an autotelic experience (Csikszentmihalyi, 1991). The emergence of these nine dimensions results in the experience of flow.

Csikszentmihalyi defined the flow experience through his studies on dancers, mountaineers, chess players, musicians, surgeons, and basketball players (Ingman, 2018). Therefore, the match between skill and challenge carries the potential to result in deep engagement in a task perceived as intrinsically rewarding, which leads to the emergence of the flow experience (Keller & Blomann, 2008). Flow is typically associated with high levels of performance and positive experiences, as it is

considered an optimal psychological state (Jackson & Eklund, 2002). The flow experience emerges as a state of full performance when personal skills match the required challenges (Jackson & Marsh, 1996). Research on flow shows that people are motivated to participate in outdoor recreational activities because they experience intrinsic pleasure, well-being, and a sense of personal competence (Boniface, 2000). Many studies show that people can experience greater flow through outdoor activities compared to indoor activities (Hartig et al., 1997; Chang, 2017). The flow experience emerges when people demonstrate productivity and performance in their leisure time and work life, and it shares common psychological characteristics. Since people enjoy and are satisfied with the flow experience, they tend to participate in these activities for longer durations (Wu & Liang, 2011). In this context, flow in outdoor recreation activities is facilitated by elements such as a sense of control, deep concentration, challenge, and goal setting (Kim & Thapa, 2018; Wu & Liang, 2011). Furthermore, some exceptional recreational activities often take place with high levels of intensity, involvement, and commitment, and outdoor recreation contributes to such activities (Chang, 2017). In the context of the flow experience, participants in outdoor recreation may range from general interest and low involvement to specific interest and high involvement (Bryan, 2000). The flow experience is less common in the ordinary settings of daily life, and it is known that the dimensions of flow become more apparent when participants engage in adventurous and challenging physical activities (Mackenzie et al., 2011).

Similarly, adventure seeking is associated with the individual's desire to experience novelty, risk, and excitement, and it represents the boundary-pushing aspect of outdoor recreation. Adventure-seeking behavior is defined as the desire to engage in physical activities that generate extraordinary experiences and sensations (Wishart et al., 2017b). Adventure-seeking behavior has positive outcomes such as taking responsibility, feeling happier and more relaxed, individual and social well-being, socialization, experiencing nature, and learning and developing skills. Perceived risk in adventure behavior is a subjective concept. Therefore, situations in natural environments that pose significant risks for some individuals may not be perceived as risky by others (Prochniak, 2017). Mentally, adventure-seeking behavior increasingly includes students who participate in exchange programs or training courses, individuals who travel to other countries to learn new languages, or those who acquire new skills such as cooking (Swarbrooke et al., 2003). Today, people enjoy spending time in natural areas with their families or close friends. Activities in natural environments often include adventure-seeking experiences. These experiences encompass various activities such as challenges, corporate development programs, and extended wilderness experiences (McIntyre & Roggenbuck, 1998). Adventure-oriented activities are generally outdoor and open-air recreational activities with uncertain outcomes that create significant impacts on participants. These activities

often involve risk or danger and can be categorized as soft or hard. Soft adventure activities such as hiking, cycling, and canoeing are typically preferred when participants have lower skill levels. In contrast, hard adventure activities such as mountaineering, rock climbing, and paragliding require higher levels of skill (Ewert & Hollenhorst, 1995). These various activities offer individuals the opportunity to experience different adventures in natural environments (Swarbrooke et al., 2003).

The primary motivations for participating in adventure activities include adaptation, personal adventure seeking, individual development, connection with nature, and social interaction (Chang & Huang, 2012). In the leisure studies literature, the term "adventure" often refers to participation in specific activities such as outdoor recreation, adventure recreation, or risk recreation (Sung, 2004). Adventure represents a complex experience that involves a combination of emotional and cognitive dimensions such as uncertain outcomes, excitement, risk-taking, novelty, challenge, escape, and exploration (Kane & Zink, 2004). By engaging in adventure-seeking behavior, individuals satisfy their desire to experience dangerous or uncertain outcomes (Lee & Tseng, 2015). When an individual has sufficient control over an adventure activity during outdoor recreation, they experience positive emotions such as a sense of competence and increased arousal. Conversely, when an individual cannot control the outcome of the activity, the experience is often characterized by negative emotions such as anxiety, worry, and fear (Tsaur et al., 2015). Participation in adventure activities can meet the psychological needs for challenge among outdoor recreation participants (Lee & Tseng, 2015). When participants have adequate control over an adventure activity, they typically experience positive emotions such as competence and heightened arousal. However, if they are unable to control the outcome of the activity, the experience may be characterized by negative emotions such as anxiety, worry, and fear (Tsaur et al., 2015).

Leisure satisfaction, as a process in which both physical and psychological needs are met, reflects the contribution of outdoor activities to individuals' life satisfaction. The concept of satisfaction is defined as a relative construct associated with a certain standard. This standard may be derived from an individual's previous experiences, expectations, successes in other areas of life, or perceived levels of satisfaction obtained from others' leisure activities (Francken & Raaij, 1981). Leisure satisfaction is defined as the positive perceptions and emotions that individuals gain from participation in recreational activities (Beard & Ragheb, 1980). While leisure satisfaction is a subdomain of life satisfaction encompassing areas such as work, marriage, family, health, community, and education it is also a component of subjective well-being (Chick et al., 2022; Chick et al., 2021; Newman et al., 2014). This sense of satisfaction arises from individuals' perceptions or from the fulfillment of an unconscious need, and it can be considered an important outcome due to its effects on health and well-being (Rosa et al., 2019). Participation in leisure activities has become one of the most popular

theoretical frameworks for understanding the psychology of outdoor recreation participants. This theoretical structure has been applied in various leisure settings, including physical activities and tourism (Lee et al., 2022). Leisure satisfaction, as one of the core functions of leisure, is influenced by various factors. The characteristics of an activity, the use of physical abilities, and the development of educational values all play a role in leisure satisfaction, while the social interactions experienced during this process also hold significant importance. Research confirms that participation in leisure activities has positive effects on overall life satisfaction (Ahn & Song, 2021). Moreover, leisure satisfaction represents a unique process aimed at enhancing individuals' health and happiness (Rosa et al., 2019).

Adventure Seeking and Flow Experience in Outdoor Recreation

Outdoor and adventure activities, by their nature, encourage high levels of participation and thus provide opportunities for significant positive experiences. As practitioners in this field, developing an understanding of the nature and characteristics of such experiences can help us comprehend why outdoor and adventure activities are intrinsically motivating (Boniface, 2000). Flow states, extensively researched in physical activity settings and various other life domains, are also of interest to researchers in the field of adventure recreation. These states have long been recognized as critical sources of enjoyment and motivation across a range of adventure activities, from rock climbing to surfing (Jackson et al., 2023). Since its inception, the flow experience has been examined among rock climbers, mountaineers, and surfers within adventure seeking contexts, and it has been identified as a pleasurable and significant source of motivation for participants (Boudreau et al., 2020).

A review of the literature reveals studies that explore the relationship between adventure seeking and flow experience (Jones, 2008). It has been found that providing individuals engaged in adventure activities with opportunities to experience flow may be influenced by their desire to be in nature, to control and mitigate risk (Boudreau et al., 2020). The adventure-seeking characteristics of whitewater canoeists have been influenced by the four-channel flow model (Jones, 2008). The flow theory and reversal theory have been used together, offering insights into the qualitative differences in flow states among adventure participants, combining flow and reversal theory structures in adventure seeking (Mackenzie et al., 2011). The likelihood of participants experiencing flow during activities has increased their chances of attaining this mental state, spreading positive information about their experiences, and enhancing their life satisfaction (Amatulli et al., 2021). Based on these findings, the following hypothesis has been developed:

H1, H2: There is a positive relationship between adventure behavior seeking and recreational flow experience.

Adventure Behavior Seeking and Leisure Satisfaction in Outdoor Recreation

It is known that adventure seeking facilitates a range of positive emotional and cognitive outcomes such as increased self-confidence, self-esteem, resilience, intrinsic motivation, enjoyment, competence, relatedness, and autonomy, and also promotes personal transformations, well-being, and the development of eco-centric perspectives (Brymer & Schweitzer, 2013; Scarf et al., 2018). Subjective well-being models define well-being in terms of a set of emotions arising from what people do, how they think, and how they feel, and positive emotions resulting from leisure practices such as adventure seeking include happiness, joy, satisfaction, and excitement (Newman et al., 2014). In this context, it can be stated that leisure practices also provide a sense of purpose and meaningfulness (Houge Mackenzie & Hodge, 2020).

Studies revealing the relationships between adventure seeking and leisure satisfaction are available. McAvoy and Dustin (1986) identified three main factors contributing to increased leisure satisfaction. First, participation is intrinsically motivated; this includes freedom of choice and activities for one's own sake. Second, there is a sense of competence accompanying this participation, which can be personal or interpersonal. Lastly, active participation in activities rather than passive involvement is important. Tsaor et al. (2015) observed that perceived challenge increases flow experience and satisfaction. Kül Avan and Güçer (2019) determined that activity motivation emerging in adventure recreation strengthens the perception of leisure satisfaction by enhancing individuals' sense of enjoyment. Leisure satisfaction particularly arises in adventure activities when intrinsic motivation creates a sense of competence and opportunities for active participation are provided. Triantafyllidou & Petala (2016) described the adventurous content of water-based activities as satisfying participants' leisure time needs, escape, and socialization. Based on these, the following hypothesis has been developed:

H3: There is a positive relationship between adventure behavior seeking and leisure satisfaction.

Flow Experience and Leisure Satisfaction in Outdoor Recreation

Sustained happiness is influenced by participation in leisure activities that produce flow experiences (Diener, 2000). Since leisure participation and consequently leisure experiences are antecedents of leisure satisfaction, leisure satisfaction is very likely the best predictor of happiness and quality of life (Spires & Walker, 2008). Previous studies have shown that flow experience can be attained in various domains of daily life, including leisure contexts, providing satisfaction. Looking at research on flow experience and leisure satisfaction, Kwon & Park (2009) found that activities occurring

during leisure increase flow experience, and as a result of this increase in flow experience, leisure satisfaction is also enhanced. Erkmen Hadi et al. (2021) found a significant and strong positive relationship between leisure satisfaction and flow experience. Yetim et al. (2020) found that nostalgia tendency affects leisure satisfaction and life satisfaction but does not influence flow experience and happiness. Eskiler et al. (2019) determined that providing leisure benefits in outdoor recreation activities has a positive effect on participants' leisure satisfaction. Çetinkaya et al. (2017) stated that active participation in outdoor activities can increase individuals' levels of leisure satisfaction. Cheng et al. (2016), in their study, demonstrated that leisure satisfaction is positively and significantly related to flow experiences. Based on these, the following hypothesis has been developed:

H4, H5: There is a positive relationship between recreational flow experience and leisure satisfaction.

The Mediating Influence of Flow Experience

A review of the literature shows that numerous studies have examined the mediating effect of flow experience in various disciplines. In a study conducted by Tsaur et al. (2013) on mountaineers, it was found that transcendent experience significantly affects flow experience and happiness; flow experience positively influences happiness and plays a mediating role in the relationship between transcendent experience and happiness. Tian et al. (2022) demonstrated in the relationship among recreation expertise, self-efficacy, flow experience, and life satisfaction that recreation expertise and self-efficacy have direct and positive effects on runners' flow experience. They suggested that recreation expertise, self-efficacy, and flow experience are positively related to runners' life satisfaction. In a study conducted by Tao et al. (2022), flow experience was found to have both direct and indirect mediating effects on leisure participation and place attachment. Leisure participation has a significant positive effect on flow experience, flow experience has a significant positive effect on place attachment, and leisure participation has both a direct effect on place attachment and an indirect mediating effect via flow experience. Based on these, the following hypothesis has been developed:

H4a, H5a: The recreational flow experience mediates the effect of adventure behavior seeking on leisure satisfaction.

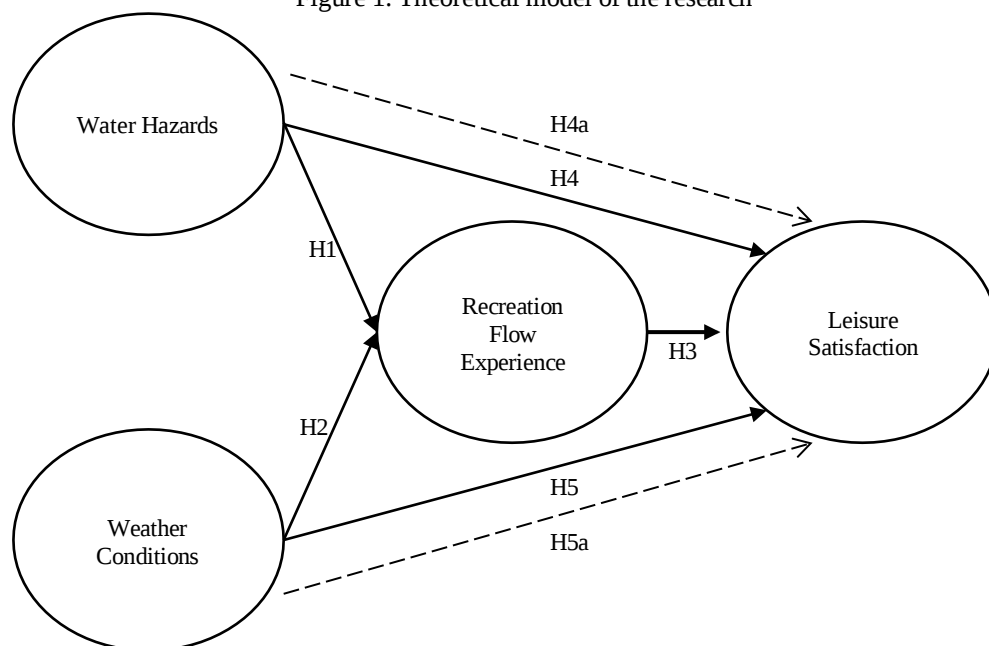
Current Study

Outdoor recreational activities, which garner interest and high participation rates globally, offer individuals the opportunity to experience different emotions and states through various activities. However, more research is needed on the emotional states experienced by individuals during outdoor recreational activities. Such research could contribute to the development of policies aimed at promoting participation in outdoor recreational activities and introducing them to the broader community. Additionally, it is important that these studies focus not only on rural areas but also on

urban outdoor. In this context, research examining the mediating role of the recreational flow experience in the relationship between adventure seeking and leisure satisfaction among outdoor recreation participants should be conducted. These studies could encourage individuals to participate in outdoor recreational activities, help organizations operating in this field to plan their activities more effectively, and contribute to the formulation of different strategies for policymakers. Consequently, this study is thought to make a significant contribution to promoting participation in outdoor recreational activities and developing policies in this area. It is hoped that such research will support efforts to enhance the overall well-being and quality of life of the community.

This study has the potential to contribute both theoretically and practically to the field of outdoor recreation. Theoretically, it first expands the literature on outdoor recreation in a developing country by contributing to and broadening its scope. Second, the model applied in this study is pioneering in its use in the field of outdoor recreation and can provide theoretical contributions for the design of subsequent studies. Third, by integrating new factors into the model used in this study, it can add theoretical depth to future research on outdoor recreation participants. The findings of this study are anticipated to significantly aid recreation leaders, managers, and participants in understanding the underlying factors or mechanisms motivating participation in outdoor recreational activities. The results of the study will allow outdoor recreation leaders and participants to evaluate the outcomes in a developing country and indirectly compare them with the situation in developed countries.

Figure 1. Theoretical model of the research



Methods

Study Area

In this study, the relational survey model, one of the quantitative research methods, was employed. The relational survey model is a research design that aims to determine the direction and degree of change between two or more variables. It focuses on identifying distinctions and relationships between individuals, objects, or situations (Karasar, 2009). The study group consists of individuals aged between 18 and 65 who regularly participate in nature-based outdoor recreation activities within the scope of outdoor recreation in Turkey and have experience in at least two different types of such activities. The study was conducted with 24 different outdoor recreation activities (mountaineering, mountain biking, diving, hiking, snow biking, snow rafting, camping, canoeing, canyoning, rock climbing, skiing, sledding, rowing, caving, rafting, windsurfing, snowboarding, surfing, kite surfing, paragliding, sailing, hang gliding, swimming, and wingsuit flying) held in fifty different cities across seven geographical regions of Turkey. Turkey boasts a geologically rich landscape, featuring mountains, rivers, lakes, seas, plateaus, caves, and canyons. While approximately 78% of Turkey's land area is mountainous, only 36% of Europe's land area consists of mountains (Duran, 2012). These mountainous areas are ideal for activities such as mountaineering, rock climbing, ice climbing, mountain biking, trail running, and hiking. Turkey also has numerous rivers with unique characteristics, providing excellent venues for outdoor activities like canoeing, rafting, and swimming (Çelik, 2018).

Research Model

In this study, a relational screening model, one of the quantitative research methods, was used. Relational screening is a research model that aims to determine the co-variation and degree of two or more variables. It focuses on identifying distinctions between individuals, objects, and other situations (Karasar, 2009). Accordingly, the theoretical model of the study is presented in Figure 1. The model consists of four main variables: Water Hazards, Weather Conditions, Recreational Flow Experience, and Leisure Satisfaction. Recreational flow experience and leisure satisfaction are dependent variables, while Adventure Seeking 1 and Adventure Seeking 2 serve as independent variables. Additionally, recreational flow acts as a mediating variable.

Data Collection Process

This study was conducted on individuals participating in activities at 142 outdoor recreation centers located in 50 randomly selected provinces across Turkey between March 1 and August 31, 2022. The geographical scope was determined to represent outdoor recreation behaviors in different socio-cultural and ecological regions of Turkey. Cities were selected using a stratified random sampling

method, aiming to reflect recreational participation patterns more generally across areas with diverse characteristics such as urban, rural, coastal, and mountainous regions. A total of 2,000 survey forms were distributed to outdoor recreation centers within the scope of the study. Of these, 1,403 surveys were returned. Sixty-three of these surveys were excluded from the study due to issues related to missing data and outliers. As a result, 1,340 survey forms were included in the analyses. This sample size was evaluated in accordance with key recommendations in the literature to determine its adequacy for Structural Equation Modeling (SEM). It is recommended that there be at least 10 participants per free parameter in SEM analysis (Hair et al., 2014; Kline, 2016). Since the model contains 21 free parameters, a minimum of $21 \times 10 = 210$ participants is required. In this context, the sample of 1,340 participants substantially exceeds this threshold. Additionally, an RMSEA-based post-hoc power analysis (MacCallum et al., 1996) was conducted, indicating that the current sample size provides statistical power above 80%.

Variable Measurement

Adventure Behavior Seeking Scale

The measurement tool developed by Prochniak (2017) and adapted into Turkish by Güngörmüş et al. (2022) consists of two dimensions: “Water Hazards” and “Weather Conditions.” The “Water Hazards” dimension includes 4 items (e.g., “I swim far from the shore,” “I try to control how long I can stay underwater,” “I jump into water from steep cliffs”). The “Weather Conditions” dimension includes 3 items (e.g., “I go hiking,” “I participate in outdoor activities even if it is cold or windy,” and “Mud or dust does not prevent me from hiking”). This measurement tool uses a 4-point Likert scale with options ranging from “(1) Does Not Describe Me at All” to “(4) Describes Me Very Well.” Confirmatory Factor Analysis (CFA) was conducted to test the two-factor structure of the scale. The results indicated that the model fit indexes were within acceptable to excellent limits: $\chi^2/df = 3.10$, GFI = 0.97, AGFI = 0.94, CFI = 0.95, NFI = 0.93, SRMR = 0.05, RMSEA = 0.076. The factor loadings of the scale ranged from 0.57 to 0.75, and the Cronbach’s Alpha coefficients were found to be between 0.70 and 0.71 (Güngörmüş et al., 2022).

Recreational Flow Experience Scale

The scale developed by Ayhan et al. (2020) is unidimensional and consists of 9 items, such as “The leisure activity in which I participate increases my self-confidence,” “I give my full attention to the leisure activity in which I participate,” and “I have an enjoyable experience during the leisure activity in which I participate.” The scale uses a 7-point Likert format with responses ranging from “(1) Strongly Disagree” to “(7) Strongly Agree.” For the 9 items on the scale, the factor loadings ranged

from 0.492 to 0.892, the R^2 values for all items ranged from 0.242 to 0.736, the composite reliability was calculated as 0.941 ($CR \geq 0.70$), and the Cronbach's alpha coefficient was 0.935 ($\alpha \geq 0.70$).

Leisure Satisfaction Scale

The scale developed by Akyıldız Munusturlar & Argan (2016) is unidimensional and consists of 5 items, such as "I am satisfied with participating in the leisure activity I choose," "I really enjoy the leisure activity I choose," and "I take pleasure in participating in this activity." The scale uses a 5-point Likert format with responses ranging from "(1) Strongly Disagree" to "(5) Strongly Agree." The total variance explained by the scale is 67.747%, with an eigenvalue of 3.387. The Cronbach's alpha coefficient for the scale was found to be 0.85.

Data Analysis

The collected data were evaluated using the statistical software packages SPSS-26 and AMOS-26. The data analysis followed a three-stage process. First, the normality of the data was checked by considering skewness and kurtosis values. In the second stage, the scale structures were examined in terms of reliability and validity. To achieve this, Confirmatory Factor Analysis (CFA) was conducted using AMOS. The scale structures were tested against reliability and validity criteria. Model fit was evaluated using fit indices such as Chi-square, Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and Comparative Fit Index (CFI), and was found to be within acceptable limits. Thirdly, Cronbach's alpha coefficients for each factor were checked to observe acceptable internal consistency. To assess acceptable validity, factor loadings and t-values for each item within the relevant factors were examined. After these procedures, the proposed hypotheses were tested. At this stage, the relationships among adventure behavior seeking, recreational flow experience, and leisure satisfaction were evaluated. Initially, the significance level of the linear relationship between adventure behavior seeking and leisure satisfaction was assessed. Then, to test the mediation relationship, the recreational flow experience was added to the model as a mediating variable, and the analysis was repeated. According to Baron and Kenny (1986), before evaluating mediation, the mediator must be tested in the model. Therefore, in the study, first, the direct effect of adventure behavior seeking on leisure satisfaction was analyzed. This relationship was expected to be significant. Then, the mediating variable, recreational flow experience, was added to the model, and the analysis was repeated. If the strength of the relationship between the independent and dependent variables decreases at this stage, it indicates partial mediation; if the relationship disappears entirely, it indicates full mediation.

Results

This section of the study presents the analysis results related to the two-factor structure of the ABSS, as well as the single-factor scores of the RFE and LS. Additionally, the structural model findings concerning adventure behavior seeking, recreational flow experience, and leisure satisfaction are included.

Sociodemographic and Visit Characteristics

A total of 57.1% of the participants are male, and 42.2% fall within the 18-29 age group. Overall, 62.2% are married, and 56.4% have a bachelor's degree. About 57% of the respondents have a monthly household income of 5000 Turkish Liras or less. Approximately 58% of the participants sometimes experience difficulties in spending their leisure time. Around 46% occasionally participate in outdoor activities. A total of 34% engage in outdoor activities 13 or more times per year, and 74.2% participate in outdoor activities as a group (Table 1).

Table 1. Demographic characteristics, leisure management difficulties and activity participation characteristics

Variable	<i>n</i>	Percentage (%)
Gender		
Male	765	57.1
Female	575	42.9
Age		
18-29	566	42.2
30-39	297	22.2
40-49	262	19.6
50-65	215	16
Marital Status		
Single	833	62.2
Married	507	37.8
Education Level		
Primary School	39	2.9
High School	191	14.3
Associate Degree	205	15.3
Undergraduate Degree	756	56.4
Graduate Degree	149	11.1
Household Income		
5500 and lower	762	57
5501-9000	363	27
9001-12500	142	10.6
12501 and higher	73	5.4
Leisure Management Difficulty		
Never	431	32.2
Sometimes	776	57.9
Always	133	9.9
Activity Participation Frequency		
Rarely	291	21.7
Sometimes	613	45.7
Often	436	32.5
Annual Number of Activity Participations		
1-4 times	374	27.9
5-8 times	291	21.7
9-12 times	219	16.3
13 times and more	456	34
Type of Activity Participation		
Individual	346	25.8
Group	994	74.2

n=1340

Descriptive Findings Regarding The Research Variables

Within the scope of the study, when the arithmetic means of the scores obtained by the participants from the ABSS were examined by factor, it was observed that the mean score was 2.35 in the Water Hazards dimension and 3.12 in the Weather Conditions dimension. The arithmetic mean of the RFE in the research group was found to be 5.84. Similarly, the arithmetic mean of the LS in the research group was determined as 4.23. When the skewness and kurtosis values of the scores obtained from the scales were examined, it can be stated that the data show a normal distribution (Table 2).

Table 2. Distribution of scale scores

Scales Dimensions	Number of Items	N	Min.	Max.	Ave.	Ss.	Skew	Kurt.
Water Hazards	4	1340	1	4	3.12	0.71	-0.67	-0.42
Weather Conditions	3	1340	1	3	2.35	0.77	0.11	-0.88
RFE	9	1340	1	9	5.84	0.84	-0.73	0.15
LS	5	1340	1	5	4.23	0.567	-0.67	0.17

Evaluation of the Measurement Model

In the evaluation of the measurement model, the model fit values were examined by taking into account the recommendations of Fornell & Larcker (1981) and Hair et al. (2009). The relevant results are presented in Table 1. For internal consistency, Cronbach's Alpha (CA) values were considered. Accordingly, the obtained CA values are above the recommended threshold value of 0.60 (Nunnally, 1978). Therefore, internal consistency is ensured.

Table 3. Measurement model: confirmatory analysis and scale reliability

Structure	Statements included in the scale	Factor loadings	t-value	α
Water Hazards	I go for walks in nature	0.435	Fixed substance	0.620
	I go for outdoor activities even in cold or windy weather	0.673	12.247***	
	Mud or dust doesn't stop me from hiking	0.704	12.283***	
Weather Conditions	I swim far from the shore	0.654	13.961***	0.651
	I try to control how long I can stay underwater	0.636	Fixed substance	
	I jump into the water from steep slopes	0.472	12.172***	
	I jump into cold water without preparation	0.492	120.519***	
RFE	The leisure activity I participate in increases my self-confidence.	0.538	17.424***	0.848
	I give my full attention to the leisure activity in which I participate.	0.594	19.020***	
	I have an enjoyable experience during the leisure activity in which I participate.	0.587	22.108***	

	I feel highly motivated during the leisure activity in which I participate.	0.654	Fixed substance	
	The leisure activity I participate in makes me happy.	0.690	21394***	
	I lose track of time during the leisure activity in which I participate.	0.639	20.264***	
	The leisure activity in which I participate is enjoyable.	0.666	20.733***	
	I feel competent in the leisure activity in which I participate.	0.661	20.839***	
	I feel highly motivated during the leisure activity in which I participate.	0.500	16.329***	
	I am satisfied with participating in the leisure activity I choose.	0.600	Fixed substance	
r s	I really enjoy the leisure activity I choose.	0.609	22.706***	n 777
	I take pleasure in participating in this activity.	0.551	16.486***	
	The activity meets my expectations.	0.561	16.729***	
	I find this activity to be even more enjoyable than I expected.	0.511	15.532***	

Note: Fit indices for the measurement model: $\chi^2/df = 4.831$; RMSEA = 0.053; CFI = 0.92; GFI = 0.94; NFI = 0.90; AGFI = 0.92; TLI = 0.90; CR = Composite Reliability; AVE = Average Variance Extracted; Significance level: ***p < 0.001

When examining the goodness-of-fit indices of the measurement model, it is seen that the recommended threshold values are met (Meydan & Şeşen, 2011). The Goodness-of-Fit Index (GFI) and the Adjusted Goodness-of-Fit Index (AGFI) being above 0.90, the Root Mean Square Error of Approximation (RMSEA) being below 0.08, the Comparative Fit Index (CFI) being 0.95, and the Non-Normed Fit Index (NFI) being above 0.90 indicate that the model has good fit values. In addition, the Chi-square/degrees of freedom (χ^2/df) ratio is expected to be below 5 (Yılmaz & Varol, 2015). For the model in this study, the goodness-of-fit values are within acceptable limits; $\chi^2/df = 4.831$; RMSEA = 0.053; CFI = 0.92; GFI = 0.94; NFI = 0.90; AGFI = 0.92; TLI = 0.90.

The model showing the standardized coefficients obtained from the analysis is presented in Figure 2. In general, the fact that most of the factor loadings are above 0.50 indicates that the items adequately represent the related latent constructs.

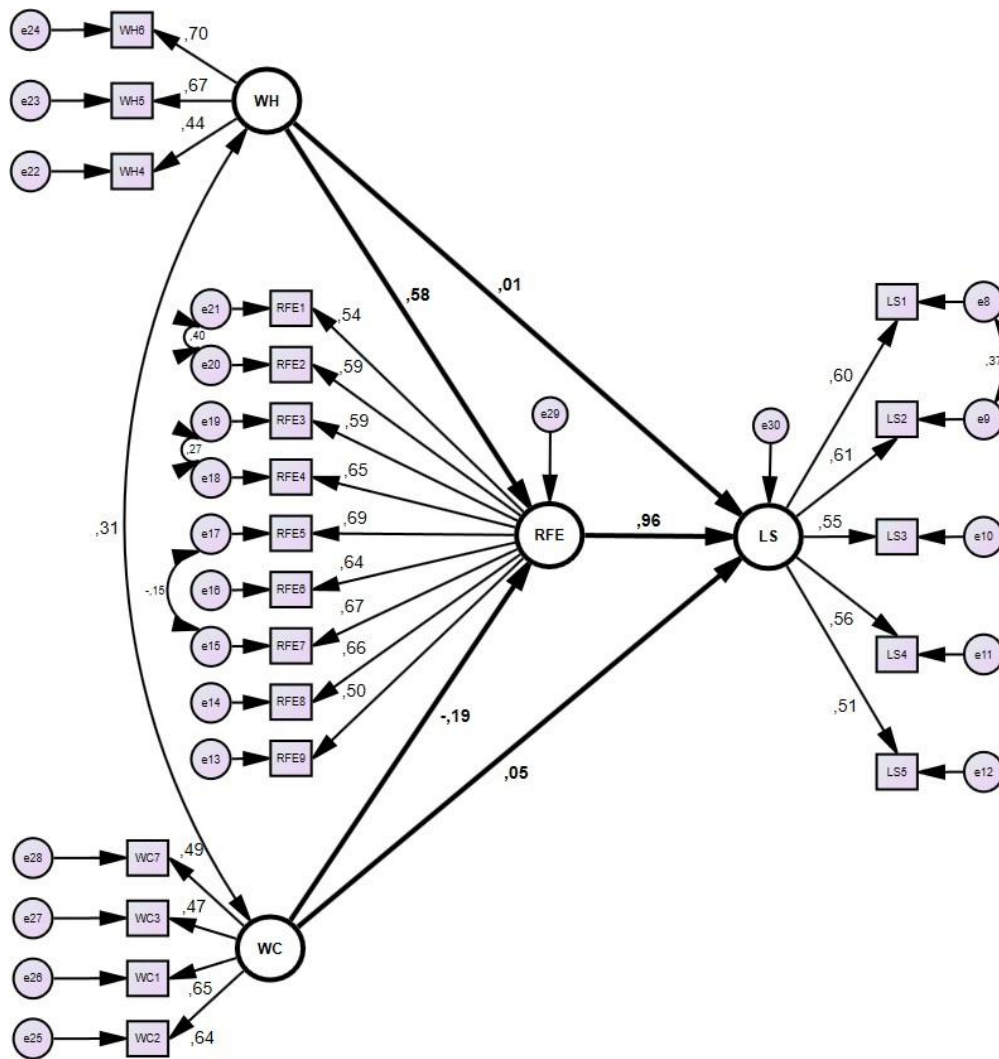


Figure 2. Path coefficients obtained by the Bootstrapping method for the research model

The structural model reveals the causal relationships between the latent variables. The measurement model shows how well the latent variables are represented by the observed variables (items) that constitute them.

Evaluation of the Structural Model

After ensuring the reliability and validity of the measurement model, the structural model was evaluated to test the hypotheses, taking into account the recommendations of Hair et al. (2017). Accordingly, R^2 , β , and t -values were considered. These values were obtained by running the bootstrapping procedure with 2,000 resamples. Water Hazards and Weather Conditions together explain approximately 31% of the variance in Recreational Flow Experience ($R^2 = 0.306$); and RFE, together with Water Hazards and Weather Conditions, explains approximately 93% of the variance in Leisure Satisfaction ($R^2 = 0.929$). As a rule, R^2 values of 0.75, 0.50, and 0.25 are considered

substantial, moderate, and weak, respectively (Hair et al., 2017). Accordingly, the explained variance for RFE is at a moderate level, while the explained variance for LS is at a substantial level.

Table 4 presents the results of the direct and total effects. Accordingly, Water Hazards and Weather Conditions significantly affect participants' Recreational Flow Experience (Water Hazards → RFE, path coefficient = 0.582, $p < 0.001$; Weather Conditions → RFE, path coefficient = -0.186, $p < 0.005$). The non-mediated effects of Water Hazards and Weather Conditions on participants' Leisure Satisfaction levels were also found to be significant (Water Hazards → LS, path coefficient = 0.544, $p < 0.001$; Weather Conditions → LS, path coefficient = -0.119, $p < 0.005$). In addition, participants' RFE significantly and positively affects their Leisure Satisfaction levels (RFE → LS, path coefficient = 0.957, $p < 0.001$).

Table 4. Hypothesis testing results (Direct and Total effects)

Hypotheses	Direct effect	Std. Beta	Std. Error	t-value	Decision	2.50%	97.50%
H1	Water Hazards → RFE	0.582	0.120	9.486**	Supported	0.517	0.646
H2	Weather Conditions → RFE	-0.186	0.037	-4.664*	Supported	-0.258	-0.114
H3	RFE → LS	0.957	0.051	14.219**	Supported	0.632	0.827
	Water Hazards → LS	0.010	0.061	0.246	-	-0.710	0.850
	Weather Conditions → LS	0.048	0.023	1.474	-	-0.006	0.103
	Total effect	Std. Beta	Std. Error	t-value	Decision	2.50%	97.50%
H4	Water Hazards → LS	0.544	0.098	8.647**	Supported	0.473	0.616
H5	Weather Conditions → LS	-0.119	0.030	-2.759*	Supported	-0.191	-0.040

** $p < 0.001$; * $p < 0.05$

Table 4 presents the results of the mediation test. The approach proposed by Baron and Kenny (1986) was adopted to test the mediation effect. Accordingly, the direct (non-mediated) effects of Water Hazards and Weather Conditions on Leisure Satisfaction were first examined. The findings indicate that both Water Hazards and Weather Conditions significantly affect participants' levels of Leisure Satisfaction. Subsequently, the mediating variable, Recreational Flow Experience, was added to the model, and the SEM analysis was conducted again.

Table 5. Indirect effect hypothesis test results

Hypotheses	Indirect effect	Std. Beta	Decision	2.50%	97.50%	P-value
H4a	Water Hazards → RFE → LS	0,558**	Supported	0,693	0,992	0,001
H5a	Weather Conditions → RFE → LS	-0,178**	Supported	-0,192	-0,075	0,001

** $p < 0.010$

As seen in Table 5, the effects of Water Hazards and Weather Conditions on Leisure Satisfaction appear to have disappeared. In addition, the indirect effects are also found to be significant (Table 5).

Based on this evidence, it is observed that the Flow variable fully mediates the effect of Water Hazards and Weather Conditions on Leisure Satisfaction.

Discussion

This research aims to reveal the mediating role of flow experience in the relationship by examining the relationships between adventure seeking, recreational flow experience, and leisure satisfaction in individuals participating in outdoor recreation activities through structural equation modeling (SEM). The findings show that adventure seeking has not only a direct effect on leisure satisfaction but also an indirect effect through flow experience. This situation provides a significant contribution to understanding the effects of outdoor recreation on individuals' psychological well-being. This study proposes a theory-based structural model to rationalize the tested structural relationships. The results indicate that the hypotheses are supported. Firstly, when examining the standardized regression coefficient values, it is observed that adventure behavior seeking has a direct and significant effect on the recreational flow experience. A review of the literature reveals no prior research specifically addressing the relationship between adventure behavior seeking and the recreational flow experience. Adventure seeking also involves high risks, such as injury and death, which are central to outdoor recreation (Prochniak, 2017). Excitement and adventure seeking are defined as the desire to engage in physical activities that evoke extraordinary experiences and sensations (Zuckerman, 1994). Some people may seek negative means to achieve excitement. For adventure-seeking individuals, positive avenues can fulfill the need for arousal, excitement, and heightened emotions (Keane et al., 2020). Csikszentmihalyi & Csikszentmihalyi (1990) describe the flow state as an exceptionally pleasurable experiential condition that serves as a central motivation for participation in adventure activities. As outdoor activities can be the only place to experience excitement, excitement seeking aligns with adventure seeking, and the adventure behavior seeking scale is positively associated with different aspects of excitement seeking (Prochniak, 2017).

Adventure behavior seeking has also been found to have a direct and significant effect on leisure satisfaction. This result supports the research hypothesis. Adventure behavior is not synonymous with leisure since some professional activities can also be experienced as adventurous. However, many forms of leisure involve adventure, and subcultures of youth, outdoor activities, or tourism often center around adventure in the social world (Vester, 1987). Active participation, another component of high leisure satisfaction, is central to adventure programs. Participants are given the opportunity and encouraged to participate actively. Adventure activities provide a unique opportunity for participants to be fully and deeply engaged (McAvoy & Dustin, 1986).

Adventure seeking manifests as a productive opportunity in contemporary social life by facilitating new relationships, creating new friendships, and providing new sensations and emotions, especially in leisure time and other areas of life (Marinho, 2008). Like many activities in which individuals participate, adventure seeking is a recreational activity conducted during leisure time. One of the main reasons for participating in leisure activities is to allow participants to rest and rejuvenate, leading to positive psychological feelings during and after the activity. This phenomenon is described as leisure satisfaction in the literature. Individuals achieve leisure satisfaction after participating in various adventure activities. Thus, it is expected that leisure satisfaction is positively influenced by adventure seeking.

The flow experience was found to have a direct and significant effect on leisure satisfaction. This result supports the research hypothesis. Outdoor recreation activities provide participants with more opportunities to perceive the flow experience. When outdoor recreation participants remain committed to leisure activities and feel excited, engaged, and focused, they are willing to invest time and effort, resulting in the flow experience. In other words, if recreational activity participants have a high level of involvement, they find it easier to concentrate and immerse themselves fully in the activity, leading to the flow experience (Cheng & Lu, 2015). From the perspective of leisure satisfaction, outdoor recreation participants with a high flow experience tend to express themselves, enjoy self-fulfillment, and achieve the best experiences. It is expected that individuals who experience flow during outdoor recreation activities will achieve a high level of leisure satisfaction afterward.

Our final hypothesis tested whether the flow experience mediates the effect of adventure behavior seeking on leisure satisfaction. The results are consistent with previous studies where recreational activity categories were used as mediating variables (Tsaur et al., 2015; Tian et al., 2022). One of the main reasons underlying the positive effect of adventure behavior seeking on leisure satisfaction among outdoor recreation participants is the transition into a flow state during the activity. Therefore, this study provides a significant contribution to the knowledge pool in the field of outdoor recreation, being one of the first to demonstrate this relationship.

Limitations and Future Research Direction

This research is limited to participants who are between the ages of 18-65, who participate in outdoor recreation activities regularly, and who have experienced different outdoor activities. Secondly, the study has a cross-sectional design. Longitudinal studies can help us better understand the changes in relationships between variables over time and causal relationships.

Management Implications

This study confirms that adventure behavior seeking, recreational flow experience, and leisure satisfaction can have significant outcomes in natural environments. In this context, activity content should be developed to specifically enhance the recreational flow experiences and leisure satisfaction levels of women in outdoor recreation activities. Participation in outdoor recreation activities should be encouraged from primary education levels through all stages of education. Activities should be organized to ensure that participants with low economic means can benefit from outdoor recreation activities. Awareness campaigns should be conducted to encourage individuals who struggle with leisure time management to participate in outdoor recreation activities through centers that provide these services. To increase the frequency of participation, the number and variety of outdoor recreation activities should be increased. For participants seeking individual experiences, options for smaller group or more personalized activities should be provided.

Practitioners can plan and implement special outdoor recreation activities tailored to different age groups. More research could be conducted on various emotional states that are believed to be beneficial for outdoor recreation participants. Policies could be developed to further promote outdoor recreation to the public and encourage participation in these activities. Research on outdoor recreation should not be limited to rural areas but should also include studies on urban outdoor. The sample of this study does not represent the general population of Turkey. Outdoor recreation is increasingly becoming an important type of recreational activity for people. Especially in recent years, due to global events such as pandemics, wars, and natural disasters, people have a greater need for outdoor recreation activities to regain their lost sense of freedom. During participation in these activities, adventure behavior seeking, recreational flow experience, and leisure satisfaction are highly significant for participants. Individuals who seek adventure during these activities challenge the existing risky conditions with their personal skills, leading to a higher flow experience. It is known that individuals who achieve a high level of adventure behavior seeking and recreational flow experience also experience greater leisure satisfaction. This makes participation in outdoor recreation activities more appealing. Thanks to these emotional states, outdoor recreation participants can enjoy higher quality leisure time, participate in activities more frequently, and engage in more social interactions.

Conclusions

The relationship between adventure behavior seeking, recreational flow experience, and leisure satisfaction was examined among participants in outdoor recreation activities. Specifically, the recreational flow experience was a fundamental structure for understanding outdoor recreation

behaviors and was used as a mediator for the alignment between adventure behavior seeking and leisure satisfaction. Overall, the recreational flow experience served as a full mediator in the relationship between adventure behavior seeking and leisure satisfaction. The findings indicate that both adventure behavior seeking and recreational flow experience are important for the leisure satisfaction of individuals participating in outdoor recreation activities. Based on the findings of this study, the following recommendations are proposed:

Activities should be organized to facilitate the participation of individuals with low economic income in outdoor recreation activities. Awareness-raising initiatives should be conducted to encourage individuals who experience difficulties in utilizing their leisure time to participate in outdoor recreation activities, and access to these activities should be facilitated through centers providing related services. The number and variety of outdoor recreation activities should be increased to enhance individuals' frequency of participation. For participants seeking individual experiences in outdoor activities, programs with limited participant numbers or more specialized activity options can be developed to cater to individual participants. Practitioners can plan and implement specialized outdoor recreation activities tailored to different age groups. The number of studies investigating various emotional states that may be beneficial for outdoor recreation participants can be increased. Policies can be developed to promote outdoor recreation more broadly within society and to encourage greater participation in outdoor recreation activities. Research related to outdoor recreation activities should not be limited to rural areas but also expanded to include urban outdoor.

In this context, it has been shown that sensation seeking has not only a direct effect on leisure satisfaction but also an indirect effect through the experience of flow. This situation provides a significant contribution to understanding the psychological well-being of individuals who participate in outdoor recreation activities.

Ethics Committee Permission Information

Ethics committee permission for this study was obtained by Artvin Çoruh University and numbered E- 18457941-051.99-24211.

Declaration of Contribution of Researchers

Authors have equal contribution to the research.

Conflict of Interest Statement

The authors have no conflict of interest declaration regarding the research.

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