

Leisure Satisfaction as a Mediator of the Relationship Between Recreational Area Preferences and Flow Experiences

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Purpose: This study aims to examine the relationship between recreational area preferences and recreational flow experiences in green leisure participants, particularly focusing on the mediating effect of leisure satisfaction.

Method: The study involved 663 adults aged 18–65. Participants completed three standardized scales. The factor structure of the scales was assessed using confirmatory factor analysis, and the mediation model was tested using Hayes' PROCESS Macro (Model 4) with 5,000 bootstrap samples.

Results: The results revealed that recreational area preferences are positively related to green leisure participants' recreational flow experiences. The effects of leisure satisfaction were shown to mediate the relationship between recreational area preferences and recreational flow experiences ($\Delta R^2 = .10, P \leq .001$).

Conclusion: The findings indicate that leisure satisfaction is not only an outcome but also an important process contributing to the relationship between recreational area preferences and flow experiences. Accordingly, it is suggested that green space designs incorporating active and passive areas, sensory features, and structured programs may facilitate users' more intense and meaningful experiences.

Keywords: Parks, Recreational Preferences, Leisure Activities, User Satisfaction, Flow

Introduction

It can be argued that rapidly increasing urbanization and densely built environments are increasing concerns about the psychological and social impacts they can have on individuals. It is also believed that factors such as noise, crowds, and artificial light can negatively impact cognitive processes and reduce overall well-being. Conversely, green spaces stand out for their restorative properties, such as renewing attention, balancing stress, and promoting a sense of vitality.¹ Indeed, recent research suggests that exposure to artificial light, particularly in the evening, can have negative effects on sleep, motor performance, and cognitive functions.² These findings further emphasize the importance of natural environments for psychological recovery. While the restorative effects of nature have been explored within frameworks such as Attention Enhancement Theory³ and Stress Reduction Theory,⁴ these approaches generally offer limited explanations of an individual's active role, subjective evaluations, and emotional engagement with leisure time. In this regard, the concept of flow⁵ stands out as an optimal state of experience characterized by intense focus, intrinsic motivation, and an altered perception of time. Flow is not merely a passive consequence of environmental conditions; It can be described as a process resulting from the dynamic harmony between environmental amenities and individual participation. It has been noted that this harmony in urban green areas often emerges through recreational preferences, such as natural complexity, solitude, or social interaction.⁶

These preferences are not merely about practical conveniences;

they also reflect individuals' psychological needs and motivational tendencies, adding meaning to their leisure experiences.¹ Furthermore, cognitive, emotional, and social evaluations of the quality of individuals' activities are also thought to form a significant link in the relationship between recreational area preferences and recreational flow. It can be argued that high levels of these evaluations, referred to as leisure satisfaction,⁷ can increase focused attention, emotional engagement, and feelings of reward, in other words, recreational flow.

Given the lack of research in the literature that addresses the interaction between recreational area preferences, leisure satisfaction, and recreational flow, this study aims to address this gap. In addition, we aimed to test whether leisure satisfaction is a mediating variable between recreational area preferences and recreational flow experiences. This aimed to shed light on the cognitive and emotional processes that make leisure experiences in urban green spaces more meaningful.

The Role of Flow in Green Spaces

Flow theory, proposed by Csikszentmihalyi,⁵ describes optimal psychological states in which individuals experience deep focus, pleasure, and intrinsic motivation during activities. Flow occurs when there is a balance between perceived challenge and skill level, creating a state of complete absorption that is strongly associated with psychological well-being and forms the basis for meaningful and satisfying leisure experiences.⁸

Green spaces provide a natural and supportive environmental context for the development of flow experiences, as they offer a variety of activities that cater to different skill and interest levels.⁹ A recent study has shown that the use of green spaces

has enriching effects not only in terms of physical health but also in the context of cognitive and emotional experiences.¹⁰

Leisure activities conducted in green spaces provide a structure that minimises distracting stimuli and allows individuals to be alone with themselves, thereby facilitating the attainment of flow experiences.¹¹ Activities such as walking, running, yoga, or meditation facilitate and support the flow experience by helping the individual focus their attention on the 'here' and 'now'.¹² However, the flow experience is closely related not only to environmental factors but also to the individual's participation in the activity. For example, open-air activities that require active participation (canoeing, climbing, running, etc.) enable the individual to directly use their skills and confront challenges, thereby making a more intense and profound flow experience possible.¹³ On the other hand, flow can also be experienced through activities classified as more passive (nature observation, meditative sitting, etc.); however, in this case, flow is shaped more through mental focus and emotional regulation.¹⁴

Flow theory has been widely applied in various fields such as sports, education, and workplace productivity; however, its effects on recreational experiences in green spaces have not been sufficiently examined.⁸ Nevertheless, existing research indicates that individuals who regularly experience flow in outdoor environments report higher psychological resilience and overall well-being levels.¹⁵ Green spaces provide a favourable context for flow experiences by combining natural aesthetics, wide open spaces, and opportunities for physical and cognitive interactions.¹⁶ Furthermore flow experiences in natural environments have been associated with increased creativity, cognitive renewal, and prolonged participation in leisure activities.^{17,18}

Relationship between Recreational Area Preferences Leisure Satisfaction and Flow

Recreational area preferences, reflect which spaces individuals choose to spend their time in.¹⁹ In this context, leisure satisfaction, which refers to the level of psychological, emotional, and social satisfaction an individual derives from the activities they participate in during their leisure,⁷ is thought to have a significant impact on recreational area preferences. Furthermore, it can be argued that recreational area preferences alone are not sufficient for recreational flow, and leisure satisfaction plays a mediating role. In short, recreational area preferences alone are not sufficient to trigger flow.²⁰ It is thought that recreational flow can be experienced when the chosen area suits an individual's needs, skills, and interests.²¹

From this perspective, if preferences are inappropriate, satisfaction will be low, reducing the likelihood of entering flow. However, when preferences are suitable, satisfaction will increase, enabling flow. Thus, leisure satisfaction is thought to be a critical mediating mechanism explaining the impact of recreational area preferences on recreational flow.

The Importance of This Research

Research in the literature has largely focused on environmental

impacts, with insufficient examination of the specific mechanisms through which individuals experience the highest level of interaction in these areas. While study emphasize the importance of green spaces in stress reduction and cognitive restoration²² there are no studies investigating the effect of the relationship between recreational preferences and leisure satisfaction on flow experiences. Thus, we propose the following hypotheses:

- H₁: Recreational area preferences positively affect flow experiences.
- H₂: Leisure satisfaction mediates the relationship between recreational area preferences and recreational flow experiences.

Methods

Research Model

This study employs a mediation model based on Hayes' Process Macro (Model 4), which examines the mediating role of leisure satisfaction in the relationship between recreational area preferences (independent variable) and flow experiences (dependent variable). The theoretical model integrates key components of Flow Theory to assess how preferences and satisfaction interact in relation to immersive leisure experiences.

Participants

Table 1 shows the demographic characteristics of the participants (N = 663). 55.2% were female (n = 366) and 44.8% were male (n = 297). Data collection was conducted in Ankara, Türkiye. The mean age of the participants was 34.7 ± 10.5 years, with the majority (34.7%) in the 25-34 age group. The mean height of the participants was 170.8 ± 8.9 cm, and the mean body weight was 71.3 ± 12.4 kg.

In terms of marital status, 67.1% of the participants were single, while 32.9% were married. Most participants had at least bachelor's degree (65.8%), followed by high school graduates (24.1%), those with a postgraduate (master's/doctorate) (5.1%), and middle school graduates (4.3%). Most participants have undergraduate and graduate degrees. This distribution is believed to be because data collection took place in Ankara, Türkiye's capital. This may be explained by the high concentration of highly educated individuals working in public institutions in Ankara.

Regarding income status, most participants (79.9%) reported a monthly income between 5,000 and 9,999 TL, while 13.1% reported less than 5,000 TL and 6.9% reported earning between 10,000 and 14,999 TL. The average frequency of participation in weekly leisure activities was 3.5 ± 1.2 times per week, with 69.4% reporting 2-3 times, 23.4% reporting 4 times or more, and 7.2% reporting once a week or less. Inclusion criteria for the study included being at least 18 years old, living in an urban or suburban area, and agreeing to participate voluntarily. Exclusion criteria included being under 18 years old, having a reported psychiatric condition that would interfere with participation in leisure activities, or incomplete questionnaires.

Table 1. Demographic characteristics of participants.

Variable	Category	N	%
Gender	Women	366	55.2
	Men	297	44.8
Age	18-24	210	31.7
	25-34	230	34.7
	35-44	145	21.9
	45+	78	11.7

Stature	<160 cm	120	18.1
	160–169 cm	250	37.7
	170–179 cm	200	30.2
	180+ cm	93	14.0
Body mass	<60 kg	150	22.6
	60-74 kg	260	39.2
	75-89 kg	180	27.1
Marital status	90+ kg	73	11.0
	Single	445	67.1
	Married	218	32.9
Education	Middle school	29	4.3
	High school	161	24.1
	Bachelor's degree	439	65.8
	Postgraduate Degree	34	5.1
Income level	5000-9999 TL	530	79.9
	0-4999 TL	87	13.1
	10000-14999 TL	46	6.9
	1 time per week or less	48	7.2
Weekly leisure participation routine	2-3 times per week	460	69.4
	4+ times per week	155	23.4

Instruments

Recreation Area Preference Factors Scale

Developed by Gümüş and Özgül,¹⁹ scale measures individuals' preferences for recreational areas based on accessibility, environmental quality, and available amenities. The scale consists of 20 items rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The internal consistency of the scale, measured by Cronbach's alpha, was .89.

Flow Experience in Recreational Participants Scale

Developed by Ayhan et al.²³ scale assesses the intensity and frequency of flow experiences during recreational activities. It includes 18 items divided into dimensions such as immersion, enjoyment, and focus, scored on a 5-point Likert scale (1 = Never to 5 = Always). The scale demonstrated Cronbach's alpha of .91, indicating high reliability.

Leisure Satisfaction Scale

Scale was developed by Neal et al.²⁴ and tested for validity and reliability in the Turkish language by Argan et al.²⁵ The scale is a 5-point Likert type, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater levels of leisure satisfaction. Previous research^{24,25} has shown that this short form is reliable in measuring leisure satisfaction and demonstrates high internal consistency ($\alpha = .93$ in this study).

Data Collection Procedure

Participants were recruited through a convenience sampling method in various urban and suburban green spaces. All participants signed an informed consent form before participation. Each participant completed a questionnaire containing demographic information and three scales. Data collection took place over a four-week period. During this period, participants of varying ages, genders, and leisure habits were recruited. The surveys were administered to all participants under similar conditions and using the same standardized instructions.

Statistical Analysis

All statistical analyses were conducted using SPSS versions 26.0 and AMOS 24.0. Before the main analysis, the dataset was screened for and removed missing values and outliers. Normality was assessed using the Kolmogorov-Smirnov test and by assessing skewness and kurtosis.

The internal consistency of the measurement instruments was assessed using Cronbach's alpha coefficients. Construct validity was examined using confirmatory factor analysis (CFA), and model fit was analyzed using commonly recommended indices (χ^2/df , RMSEA, CFI, TLI, and SRMR). Model fit was assessed using commonly reported goodness-of-fit indices. The Root Mean Square Error of Approximation (RMSEA) assesses the degree of fit between the hypothesized model and the population covariance matrix; values below 0.08 are generally considered acceptable, while values below .05 indicate a close fit. The Comparative Fit Index (CFI) compares the tested model to a baseline model in which the variables are assumed to be uncorrelated; values exceeding .90 are considered indicative of an acceptable fit, while values above .95 reflect a very good fit. The Tucker–Lewis Index (TLI) takes model parsimony into account when assessing fit; values greater than 0.90 indicate an adequate fit, while values above .95 indicate a strong model fit. The Standardized Root Mean Square Residual (SRMR) reflects the average standardized difference between the observed and predicted correlations; values less than .08 are generally interpreted as evidence of a good fit.

Hayes's PROCESS macro (Model 4) was used to test our hypothesized mediation model. Direct and indirect effects were estimated, and the significance of indirect effects was examined using both the Sobel test and bootstrap resampling procedures (5,000 samples). However, indirect effects were considered statistically significant if the 95% confidence interval did not

include zero. One-way analysis of variance (ANOVA) was performed for group comparisons. When significant effects were detected, Fisher's Least Significant Difference (LSD) post-hoc tests were applied. Results are reported with F values, degrees of freedom, *P* values, and effect sizes (partial eta squared, η^2). Significance was set at $P \leq .05$. Finally, post-hoc power analyses indicated that the sample size obtained was sufficient ($>.80$) to detect at least moderate effects.

Results

Confirmatory Factor Analysis (CFA) Results

Confirmatory Factor Analysis (CFA) was conducted using AMOS 24.0 to evaluate the construct validity of the three scales utilized in this study.

The Recreation Area Preference Factors Scale demonstrated **Table 2.** Confirmatory factor analysis (CFA) results.

Scale	χ^2/df	RMSEA	CFI	TLI	SRMR	Factor Loadings Range
Recreation Area Preference Factors (a.u.)	2.18	.05	.95	.94	.048	.61–.84
Flow Experience in Recreational Participants (a.u.)	1.96	.05	.96	.95	.045	.64–.87
Leisure Satisfaction (a.u.)	1.42	.03	.99	.98	.027	.72–.85

Descriptive Statistics

Descriptive statistics for the main variables are presented in Table 3. Participants generally reported moderate to high levels of recreational preferences ($M = 3.84$ a.u., $SD = .67$), leisure satisfaction ($M = 4.12$ a.u., $SD = .81$), and flow experiences (M

acceptable fit to the data: $\chi^2/df = 2.18$, $RMSEA = .056$, $CFI = .95$, $TLI = .94$, and $SRMR = .048$. Standardized factor loadings ranged from .61 to .84 and were all statistically significant ($P \leq .001$).

The Recreational Participants' Flow Experience Scale also showed good model fit: $\chi^2/df = 1.96$, $RMSEA = .051$, $CFI = .96$, $TLI = .95$, and $SRMR = .045$. Standardized loadings ranged from .64 to .87.

Similarly, the Leisure Satisfaction Scale, although composed of only three items, yielded acceptable fit indices: $\chi^2/df = 1.42$, $RMSEA = .036$, $CFI = .99$, $TLI = .98$, and $SRMR = .027$. Standardized loadings ranged from .72 to .85.

Across all scales, the model fit indices met conventional thresholds, confirming the factorial validity of the measurement instruments. As such, composite scores were computed for use in subsequent mediation analyses.

Table 3. Presents the descriptive statistics for the main variables in the study.

Variable	Mean	Standard Deviation	Cronbach's Alpha
Recreation Area Preference (a.u.)	3.84	.67	.89
Leisure Satisfaction (a.u.)	4.12	.81	.93
Flow Experience (a.u.)	4.25	.74	.91

$= 4.25$ a.u., $SD = .74$). All variables are expressed in arbitrary units (a.u.) to indicate the standardized Likert-type scoring. Cronbach's alpha values for each scale confirm excellent internal reliability (all above .89).

The correlation matrix illustrates the relationships between the three primary variables: recreational preferences, leisure satisfaction, and flow experience. The results show significant positive correlations between all variables, suggesting that higher levels of recreational preferences are associated with

higher leisure satisfaction ($R = .53$, $P \leq .001$) and greater flow experience ($R = .48$, $P \leq .001$). Similarly, leisure satisfaction is strongly associated with flow experience ($R = .59$, $P \leq .001$). These correlations align with the theoretical expectations of the study and further validate the mediation analysis findings.

Table 4. Correlation analysis results.

Variables	Recreational Preferences	Leisure Satisfaction	Flow Experience
Recreational Preferences (a.u.)	1.00	.53	.48
Leisure Satisfaction (a.u.)	.53	1.00	.59
Flow Experience (a.u.)	.48	.59	1.00

Mediation Analysis

Table 5 summarizes the results of the mediation analysis. The total effect of recreational area preferences on flow experiences was significant ($\beta = .793$, $P \leq .001$). The direct effect (*c'* path) remained significant ($\beta = .586$, $P \leq .001$), indicating a positive association between preferences and flow. Leisure satisfaction was also significantly associated with this process. The indirect effect, calculated as the product of the path from recreational preferences to leisure satisfaction ($\beta = .433$) and from leisure satisfaction to flow experiences ($\beta = .477$), yielded $\beta = .207$ ($P \leq .001$). This mediation was confirmed by the Sobel test ($z = 6.51$, $P \leq .001$). The mediation model explained 47% of the variance in flow experiences ($R^2 = .47$), with leisure satisfaction accounting

for an additional 10% of explained variance ($\Delta R^2 = .10$, $P \leq .001$). A post hoc power analysis showed that the sample size was sufficient (power = 99.1%). Finally, the bootstrap confidence interval for the indirect effect (95% CI [.145, .281]) confirmed the mediating role of leisure satisfaction.

ANOVA Results

A one-way analysis of variance (ANOVA) was conducted to examine demographic differences. A significant difference was found in terms of flow experiences between age groups, $F(3, 659) = 4.25$, $P \leq .05$, $\eta^2 = .10$. This value indicates a medium effect size. Fisher's LSD multiple comparison test found that participants in the 18–29 age group had significantly higher flow scores than those in the 50 and older age group ($P \leq .05$).

Table 5. Mediation analysis results.

Path	Coefficient (β)	SE	T	P
Recreation Preference → Flow Experience	.79	.05	15.8	≤.001
Recreation Preference → Leisure Satisfaction (a.u.)	.43	.05	8.17	≤.001
Leisure Satisfaction → Flow Experience (a.u.)	.47	.04	10.58	≤.001
Recreation Preference → Flow Experience (Direct) (a.u.)	.58	.06	9.18	≤.001
Indirect Effect (Sobel Test) (a.u.)	.20	.03	6.51	≤.001

No significant difference was found in flow scores based on gender, $F(1, 661) = 1.12, P > .05, \eta^2 = .01$. These findings indicate that age is an influential factor on flow experiences, while gender does not have a significant effect.

Furthermore, post hoc power analyses indicated that the sample

Table 6. Results of One-Way ANOVA and Fisher's LSD Post Hoc Tests

Dependent Variable	Grouping Variable	F(df1, df2)	P-value	η^2	Significant Post Hoc Comparisons
Flow Experience (a.u.)	Age group	$F(3, 659) = 4.25$	≤.05	.10	18–29 > 50+ ($p \leq .05$)
Flow Experience (a.u.)	Gender	$F(1, 661) = 1.12$	n.s.	.01	–

Discussion

The findings of this study suggest that green space preference is not limited to physical characteristics but is also related to individuals' psychological processes. Participants' preferences serve as a link that supports the flow experience by aligning environmental conditions with personal goals, values, and expectations.²⁶ This finding aligns with approaches that explain the motivational basis of leisure behaviors.²⁷

Mediation analysis results revealed that leisure satisfaction is an important factor in this process. Sobel test and bootstrap analyses confirmed that leisure satisfaction accounts for part of the association between preferences and flow. This suggests that leisure satisfaction is not merely an outcome but also a related to maintaining recreational flow.^{28,29,30} Research conducted in the Turkish context supports this finding by emphasizing the mediating role of leisure satisfaction on meaning in life.³¹ However, the findings only address overall leisure satisfaction as a mediating factor, not separately addressing psychological, social, educational, recreational, physiological, or aesthetic factors⁷ identified in the relevant literature. It should be noted that the findings limit the depth of interpretation and that the mediating role identified here represents an indicator of overall satisfaction rather than a component of leisure satisfaction.

The findings also reveal that flow experiences are associated with long-term psychological benefits. The literature also demonstrates that flow has lasting effects on well-being. Comparable to other restorative processes, such as sleep, which are known to enhance cognitive and psychological functioning³² flow may similarly contribute to cognitive renewal and overall well-being. The literature also demonstrates that flow has lasting effects on well-being.³³ In this context, our study results can be interpreted as consistent with the “flow-well-being” link in the literature.

Furthermore, subgroup analyses indicate that differences based on demographic variables are significant, with younger participants having higher recreational flow scores. In this context, younger individuals' more frequent and intense interaction with green spaces is consistent with previous research demonstrating that leisure behaviors and motivations change across life stages.³⁴ Studies suggest that young adults tend to engage in more exploratory and risk-taking activities,

size achieved had sufficient statistical power to detect moderate effects (>.80). The observed strength of the effect regarding age groups was calculated as .99.

which can facilitate immersive experiences. Studies have also noted that older adults generally prefer structured or low-risk leisure activities.³⁵ Such life stage differences may help explain the stronger relationship between recreational preferences and flow among younger participants.³⁶ It is important for future research to examine these patterns more directly by comparing activity types and frequency of participation across age groups. This study has several limitations. Because the research is based on a cross-sectional design, the relationships between variables cannot be interpreted causally. Furthermore, the fact that data were collected using self-report measures raises the risk of common method bias. The convenience sampling and the fact that the sample consisted largely of highly educated participants also limit the generalizability of the findings.

Future studies could utilize longitudinal or experimental designs to clarify the direction of relationships and mitigate concerns about causality. However, to overcome common method bias, multi-method approaches that combine self-report data with behavioral or physiological measures are recommended. Furthermore, probability of sampling strategies with more diverse educational and socio-demographic profiles would increase the generalizability of the findings. Collecting survey data from different geographic regions of Türkiye could also increase data diversity in this context. Finally, incorporating multidimensional leisure satisfaction instruments would allow researchers to better understand the complexity of this construct and its specific contributions to flow experiences.

Practical Applications

Practically, the results support a more intentional approach to green space planning—one that incorporates users' psychological needs and values. Designing spaces that enable emotional engagement, challenge, and relaxation can elevate both satisfaction and the potential for flow.

Conclusions

This study demonstrates that recreational area preferences and recreational flow are positively correlated, with leisure satisfaction acting as a mediating factor in this relationship. The findings demonstrate that green spaces should function

not only as physical spaces but also as environments that carry psychological meaning and support inclusive leisure opportunities. Furthermore, the research contributes to existing conceptual discussions by emphasizing leisure satisfaction as a process, not merely an outcome. This perspective clarifies how environmental attributes intersect with psychological processes in leisure contexts. In Türkiye, where both the availability and quality of green spaces vary across regions, the findings have practical implications for design and policy aimed at improving public well-being

Furthermore, the proposed model provides a foundation for examining leisure processes in other cultural and geographical contexts. The combination of recreational preferences and leisure satisfaction with the flow of support offers a framework that transcends national perspectives. By combining environmental characteristics, subjective evaluations and experiential depth, this study is expected to provide theoretical context as well as practical guidance to urban planners, psychologists and leisure researchers.

Acknowledgments

The authors gratefully thank the participants for their cooperation during the study.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Ethical Committee approval

Ethical approval was obtained from the Ethics Committee of Kırıkkale University, Kırıkkale, Türkiye (Approval No: 2025/02). All research procedures complied with the ethical standards of the institutional research committee and the 1964 Helsinki Declaration and its later amendments.

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Topic

Sport Science

Conflicts of interest

The authors have no conflicts of interest to declare.

Funding

No funding was received for this investigation.

Author-s contribution

Conceptualization, F.M.K and G.K.; methodology, F.M.K.; software, F.M.K.; validation, F.M.K.; formal analysis, F.M.K.; investigation, G.K.; resources, G.K.; data curation, F.M.K.; writing—original draft preparation, F.M.K. and G.K.; writing—review and editing, F.M.K and G.K.; visualization, F.M.K.

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Received: 05.09.2025

Accepted: 09.09.2025.

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