



**THE EFFECT OF ENVIRONMENTAL AWARENESS AND  
PERCEIVED ENVIRONMENTAL QUALITY REGARDING NATURAL  
PARKS ON PRO-ENVIRONMENTAL BEHAVIOR AND DESTINATION  
SOCIAL RESPONSIBILITY THROUGH ENVIRONMENTAL  
ENGAGEMENT: THE CASE OF SAZOVA PARK IN ESKİŞEHİR**

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**ABSTRACT**

Environmental sustainability in urban parks is becoming more and more dependent on the need to identify the determinants of environmentally responsible behaviors of visitors. In the presented study, the impacts of environmental awareness and perceived environmental quality on pro-environmental behavior and destination social responsibility through mediation by environmental engagement are examined. The sample for data collection comprised 268 visitors of Eskişehir Sazova Science, Art, and Culture Park, and structural equation modeling was used for data analysis. The study findings suggest that environmental awareness and perceived environmental quality positively impact the level of environmental engagement of visitors. Environmental engagement positively and substantially increases not only pro-environmental behavior but also destination social responsibility. Furthermore, it becomes clear that destination social responsibility contributes to the enhancement of pro-environmental behavior of visitors. Additionally, environmental engagement proves itself to be an important mediator, especially when dealing with perceived environmental quality and pro-environmental behavior. On the other hand, environmental awareness appears not to be enough to promote environmentally responsible behaviors of visitors. Overall, this study shows that promoting environmental engagement and applying social responsibility principles can be helpful in encouraging sustainable behaviors in parks.

**1. INTRODUCTION**

Urban parks have become crucial areas in terms of leisure activities, social relations, and environment sustainability in the context of rapid urbanization (Wu et al., 2026). Apart from providing recreation services to the visitors, urban parks provide ecological protection, promote environmental education, and promote sustainable living among visitors (Lehto et al., 2025). The increasing numbers of visitors to recreational areas call for further research to identify the drivers of environmentally conscious behaviors as a means of promoting sustainable park management and local governance. Prior research on environmentally friendly behaviors emphasizes environmental awareness, environmental quality, and environmental engagement as key drivers of such behaviors (Boermans et al., 2024; Costa et al., 2025). Although these

concepts are analyzed separately by various researchers, little is known about their interrelation in an urban park setting. It is still unclear how visitors' awareness about the environment and perceptions regarding its quality affect their environmentally responsible behavior through environmental engagement. Within this scope, this study aims to examine the environmental awareness of individuals visiting Eskişehir Sazova Science, Art and Culture Park, the perceived environmental quality, and the impact of their environmental engagement with the park on their pro-environmental behaviors.

The fact that Sazova Park serves as an urban recreational area, with dense visitor traffic in the park, is one of the factors that makes this an important issue to be examined from the environmental sustainability perspective. The other aim of this research is to reveal how environmental awareness and perceived environmental quality influence pro-environmental behaviors through environmental engagement. The findings are expected to contribute to practices aiming to increase environmentally responsible behaviors for parks and local governments. The findings are expected to contribute to practices aiming to increase environmentally responsible behaviors for parks and local governments. This topic was chosen as it draws attention to the increasingly important role of urban parks in terms of recreation and environmental sustainability. Examining visitors' environmental awareness and behaviors towards the environment in Eskişehir Sazova Science, Art, and Culture Park, which usually has high visitor traffic, contributes to understanding the factors that shape pro-environmental behaviors. Additionally, this topic was chosen specifically because examining the variables of environmental awareness, perceived environmental quality, and environmental engagement together provides a complementary dimension to studies in the literature. Thus, the present study will attempt to answer the following research questions:

RQ1: How does environmental awareness impact the level of environmental engagement and pro-environmental behavior exhibited by urban park visitors?

RQ2: How does the perceived level of environmental quality impact the level of environmental engagement and pro-environmental behavior?

RQ3: In what way does environmental engagement mediate the relationship between environmental engagement and pro-environmental behavior?

RQ4: In what ways can destination social responsibility lead to pro-environmental behavior?

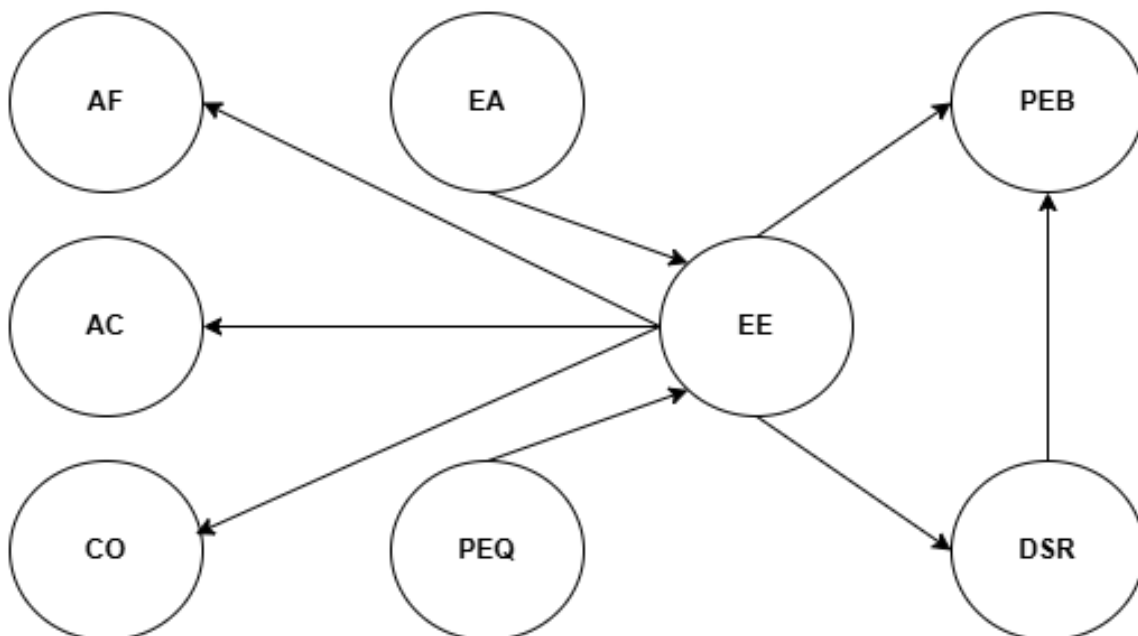
## 2. CONCEPTUAL FRAMEWORK

The studies conducted in Türkiye are examined, it is seen that the relationships between environmental perception, environmental awareness, and pro-environmental behaviors are frequently studied in urban parks and recreation areas. It has been observed from previous studies in environmental behavior literature that environmentally responsible behavior among visitors does not only depend on cognitive aspects like awareness and perception but also emotions and engagement. Hence, considering all three dimensions, that is, environmental awareness, perceived environmental quality, and environmental engagement simultaneously can help us get an overall picture of pro-environmental behavior. Aydın and Arslan (2016) and Aksöz and Çelik (2023) conducted studies on some park visitors and found that the layout, cleanliness, and social interaction of the area positively influence pro-environmental behaviors. Demircan et al. (2018) and Kocalar (2016) have found that environmental awareness and environmental responsibility vary depending on demographic characteristics through t-tests, ANOVA, and chi-square analyses. Additionally, Sancak (2022) found in their studies that environmental awareness indirectly affects pro-environmental behavior through a structural equation model. However, Kasap and Kara (2020) noted that usage intensity can increase environmental pressure. Kiper (2013) and Uzun and Müderrisoğlu (2007) highlighted that the use of green space supports quality of life and environmental responsibility awareness.

International literature highlights, it is seen that the psychological, emotional, and perceptual dimensions of pro-environmental behaviors come to the forefront (Piao & Managi, 2024; Yoon et al., 2024). Such a point of view corresponds to various theoretical models like the Stimulus–Organism–Response (S-O-R) theory, in accordance with which environmental stimuli and personal perceptions impact behavioral outcomes via certain psychological processes, and the Theory of Planned Behavior (TPB), which considers the impact of one's attitude and perceptions on behavior (Mehrabian & Russell, 1974; Ajzen, 1991). Mayer and Frantz (2004) and Halpenny (2010) conducted correlation and regression analyses in their studies and found that the emotional connection established with nature and parks significantly increases pro-environmental behaviors. Lee and Jan (2017) and Ramkissoon et al. (2012) conducted a study to test the relationships between environmental awareness, place attachment, and pro-environmental behavior in the context of ecotourism and natural areas using a structural equation model and found that there were strong relationships among these variables. Pourhossein et al. (2023) recently conducted another study and demonstrated that perceived

environmental quality and environmental engagement are determinants of pro-environmental behaviors.

Even though the number of empirical findings has been growing rapidly in recent years, most research conducted to date has concentrated primarily on natural parks, ecotourism locations, or protected areas. Relatively little attention has been paid to studying these relationships in multifunctional urban parks where there is intense use by visitors and many different activities are conducted. This study makes an original contribution to the literature by examining the issue of environmental behavior, which is predominantly addressed in the context of natural parks and tourist destinations, within the context of a multifunctional urban park such as Eskişehir Sazova Science, Culture and Art Park. Additionally, this study possesses a comparable and complementary quality to previous studies as it addresses the variables of environmental awareness, environmental engagement, and pro-environmental behavior together and tests these relationships through survey data and quantitative statistical analyses. This study aims to contribute to the existing body of knowledge on environmental behavior by integrating the variables mentioned above into the environment of an urban recreational area, and to provide insights into sustainable visitor management and eco-friendly behavior in urban parks. In this context, the study's model is outlined as follows.



*Figure 1. Research Model*

AF: Affect, AC: Activation, CO: Cognitive, EA: Environmental awareness, EE: Environmental Engagement, PEQ: Perceived environmental quality, PEB: Pro-environmental behavior, DSR: Destination social responsibility

The research model (Figure 1) was created based on the Theory of Planned Behavior (Ajzen, 1991), the Value–Belief–Norm Theory (Stern, 2000) and the Stimulus–Organism–Response

(S-O-R) model (Mehrabian & Russell, 1974). The model aims to explain visitors' pro-environmental behaviors in the context of Eskişehir Sazova Park, which is a nature-based and tourist public park. In the research model, perceived environmental quality and environmental awareness are considered as antecedents of environmental engagement. Environmental engagement is modelled as a multidimensional structure consisting of cognitive processing, affect, and activation dimensions. In this context, the study's hypotheses are outlined as follows.

- H1. Perceived Environmental Quality positively affects visitors' environmental engagement.
- H2. Environmental Awareness positively affects visitors' environmental engagement.
- H3. Destination Social Responsibility positively affects visitors' pro-environmental behaviors.
- H4. Environmental Engagement positively affects the affective level of visitors.
- H5. Environmental Engagement positively affects visitors' cognitive evaluations.
- H6. Environmental Engagement positively affects the level of visitor activation.
- H7. Environmental engagement positively affects destination social responsibility perception.
- H8. Environmental engagement positively affects visitors' pro-environmental behaviors.
- H9. Perceived Environmental Quality indirectly affects pro-environmental behaviors through environmental engagement.
- H10. Environmental Awareness indirectly affects pro-environmental behaviors through environmental engagement.

### **3. MATERIAL AND METHOD**

#### **3.1. Population and Sample**

The population of the study consists of all individuals visiting Sazova Science, Art and Culture Park in Eskişehir. The sample of the study consists of visitors who have visited Sazova Park and volunteered to participate in the online survey form. In this research, snowball sampling, which is one of the non-probability sampling methods, was used. The online survey form designed at the data collection stage was shared with the researchers' own friend circles, and the individuals who volunteered to participate in the survey were also asked to forward the form to their friends to fill in. Thus, the sample was expanded through the social networks of the participants.

The minimum sample size required for the proposed structural equation model was calculated using Soper's a priori sample size calculator. Based on an anticipated medium effect size of 0.30, a desired statistical power level of 0.80, a probability level of 0.05, 8 latent variables, and an estimated 24 observed variables, the required minimum sample size was determined as approximately 200 (Soper, 2026). The 268 participants in the study are well above this minimum threshold. Additionally, it is stated in the PLS-SEM literature that the recommended sample size for detecting a medium-effect size (80% statistical power,  $\alpha=0.05$ ) is generally in the range of 150–200 (Cohen, 1988; Hair et al., 2022). In this context, the sample size of 268 individuals is considered to have sufficient statistical power to test both direct and mediating effects.

### **3.2.Measuring Tools**

The scale used in the research was structured to measure visitors' environmental engagement levels, perceived environmental quality, perceptions of destination social responsibility, environmental awareness, and pro-environmental behaviors (Mehrabian & Russell, 1974; Ajzen, 1991; Stern, 2000; Pourhossein et al., 2023). The scale is designed as a five-point Likert-type (1=Strongly Disagree, 5=Strongly Agree). The Perceived Environmental Quality variable was taken as a multidimensional construct and measured through three sub-dimensions: affect, activation, and cognitive processing. The affect dimension assesses visitors' emotional reactions and positive feelings toward the park (e.g., "Using Sazova Park makes me happy."). The activation dimension measures behavioral tendencies reflecting the tendency to prefer and use the park (e.g. "I use Sazova Park more frequently than other parks in this city."). The cognitive processing dimension, on the other hand, refers to the intellectual evaluation and mental awareness that the park creates in visitors' minds (e.g. "Being in Sazova Park increases my mental awareness about environmental issues related to this park.").

Perceived Environmental Quality also covers evaluations regarding the park's physical characteristics, such as cleanliness, air quality, and landscaping (e.g. "Sazova Park is a very clean park."). The pro-environmental behavior dimension refers to visitors' behaviors aiming to protect the environment (e.g. obeying the rules, protection of natural life), the dimension of destination social responsibility measures the perception of the social contributions of park management, and the dimension of environmental awareness measures the level of awareness and sensitivity of individuals to environmental problems.

## 4. FINDINGS

### 4.1. Demographic Findings

In the first phase of the research analysis, the participants' demographic characteristics were examined.

Table 1.  
*Demographic characteristics of the sample*

Variable	Category	n	%
Gender	Female	128	47,8
	Male	140	52,2
Age	Below 18	8	3,0
	18–24	183	68,3
	25–34	53	19,8
	35–44	15	5,6
	Above 44	9	3,4
Education	High school and below	37	13,8
	Associate/bachelor's degree	219	81,7
	Master's Degree	9	3,4
	Doctorate and above	3	1,1
Monthly Income	10.000 TL and below	27	10,1
	10.001–20.000 TL	119	44,4
	20.001–30.000 TL	66	24,6
	30.001–50.000 TL	38	14,2
	50.001 TL and above	18	6,7
Visit Frequency	1–3 times	182	67,9
	4–6 times	61	22,8
	7–9 times	21	7,8
	More than 9	4	1,5
Residence (License plate)	26 (Eskişehir)	152	56,7
	41 (Kocaeli)	44	16,4
	6 (Ankara)	19	7,1
	34 (İstanbul)	16	6,0
	43 (Kütahya)	13	4,9
	42 (Konya)	7	2,6
	Other	17	6,3

Table 1 shows that 268 people participated in the study. 52.2% of the participants were male (n=140), and 47.8% were female (n=128). When the age distribution is examined, it is seen that the sample consists largely of young individuals. 68.3% of the participants are in the 18–24 age range, and this is followed by the 25–34 age group (19.8%). This indicates that the park is particularly popular among young visitors. When education level is considered, it is seen that

most participants (81.7%) hold associate or bachelor's degrees. Those holding a high school degree or below constitute 13.8%; however, the participants holding a postgraduate degree account for 4.5%. When the income distribution is considered, it is seen that 44.4% of the participants are within the 10,001–20,000 TL income range; however, 24.6% are in the 20,001–30,000 TL range. When the visit frequency is considered, 67.9% of participants stated that they visited the park 1–3 times. Regarding the distribution of participants by province of residence, 56.7% of participants live in Eskişehir (26 license plates); however, the remaining participants come from surrounding provinces. These findings indicate that the sample consists predominantly of young, highly educated, and local visitors.

#### 4.2. Measurement Model Results

The criteria of internal consistency reliability, convergent validity, and discriminant validity were considered when evaluating the measurement model. As seen in Table 2, the Cronbach's Alpha values for all structures range between 0.627 and 0.774. Values of 0.60 and above are considered acceptable in exploratory studies (Hair et al., 2022). The composite reliability coefficients ( $\rho_c$ ) for all constructs are above 0.80 (0.801–0.869), and this indicates high internal consistency of the scales.

Table 2.  
*Construct reliability and validity*

Factors	Cronbach's alpha	Composite reliability ( $\rho_a$ )	Composite reliability ( $\rho_c$ )	Average variance extracted (AVE)
AF	0.774	0.776	0.869	0.688
PEQ	0.768	0.771	0.866	0.683
CO	0.733	0.737	0.849	0.652
EA	0.711	0.713	0.838	0.634
AC	0.627	0.629	0.801	0.574
DSR	0.705	0.706	0.836	0.630
PEB	0.672	0.673	0.820	0.603

When examining the data in terms of convergent validity, the Average Variance Extracted (AVE) values for all constructs were observed to be above the threshold value of 0.50 (0.574–0.688). This indicates that the relevant indicators sufficiently explain the latent variable to which they belong and that convergent validity has been achieved.

Discriminant validity was tested using two methods. First, the Heterotrait–Monotrait Ratio (HTMT) was examined. According to Table 3, all HTMT values were found to be below the threshold of 0.85 (Hair et al., 2022). This indicates that discriminant validity has been established.

Table 3.  
Heterotrait-monotrait ratio (HTMT) - Matrix

	AF	PEQ	CO	EA	AC	DSR	PEB
AF							
PEQ	0.261						
CO	0.736	0.403					
EA	0.098	0.401	0.116				
AC	0.375	0.765	0.456	0.599			
DSR	0.258	0.811	0.379	0.452	0.680		
PEB	0.240	0.813	0.279	0.487	0.778	0.809	

Secondly, the Fornell-Larcker criterion was applied (Table 4). The square root of the AVE value for each construct (diagonal values) is higher than its correlation coefficients with other constructs. This demonstrates that each latent variable better represents its own indicators than other structures, and thus, they confirm discriminant validity. Consequently, when the criteria for internal consistency, convergent validity, and discriminant validity are considered together, it can be stated that the measurement model possesses adequate psychometric properties and that further structural model analysis could be performed (Hair et al., 2022).

Table 4.  
Fornell-Larcker criterion

	AF	PEQ	CO	EA	AC	DSR	PEB
AF	0.830						
PEQ	0.198	0.826					
CO	0.549	0.305	0.808				
EA	0.026	0.295	0.079	0.796			
AC	0.259	0.532	0.312	0.402	0.758		
DSR	0.191	0.595	0.276	0.321	0.452	0.794	
PEB	0.173	0.650	0.201	0.334	0.506	0.629	0.777

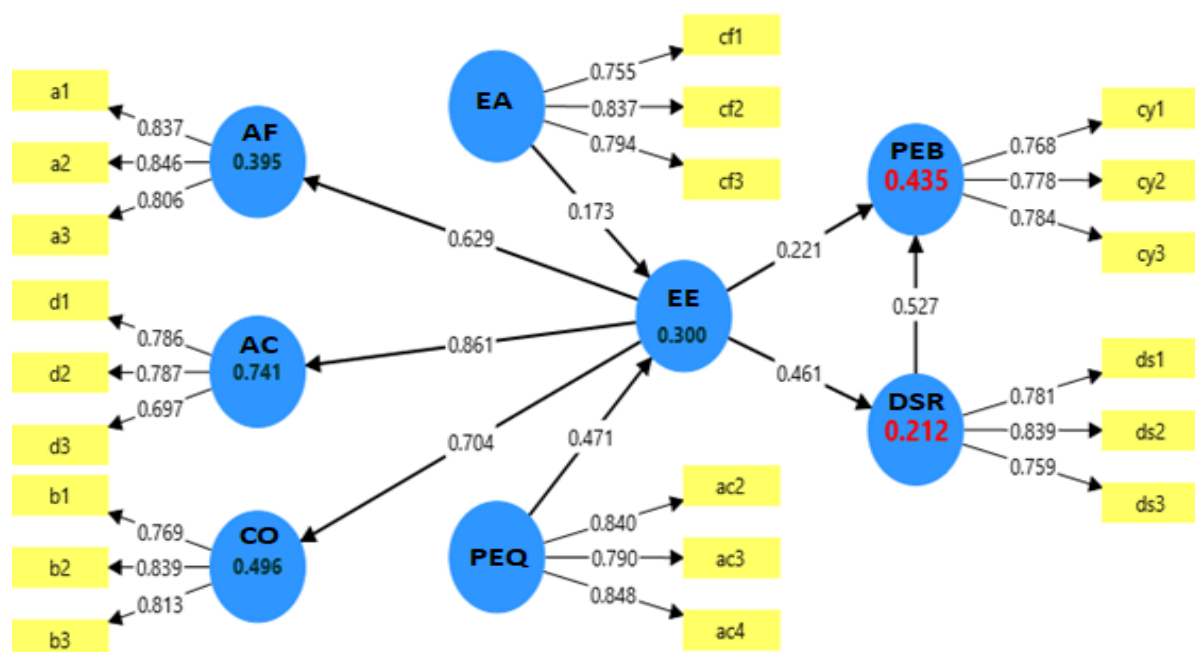


Figure 2. Measurement model

In the final stage of the analysis, PLS-SEM was applied to the research model (Figure 2).

### 4.3. Structural Model and Hypothesis Test Results

The results regarding the structural model are presented in Table 5. First, the multicollinearity problem was examined using VIF values, and all values were observed to be within the range of 1.000–1.269. This indicates that there is no multicollinearity problem in the model due to values that are well below 5 (and even below 3) (Hair et al., 2022). When direct effects are examined, the impact of Perceived Environmental Quality on Environmental Engagement is positive and significant ( $\beta=0.467$ ;  $t=9.588$ ;  $p<0.01$ ). Environmental Awareness also has a positive and significant effect on Environmental Engagement ( $\beta=0.164$ ;  $t=2.585$ ;  $p<0.01$ ). This demonstrates that perceived environmental quality and environmental awareness increase individuals' level of engagement in the park context. The effect of Destination Social Responsibility on Pro-Environmental Behavior is also strong and significant ( $\beta=0.532$ ;  $t=10.164$ ;  $p<0.01$ ). This reveals that social responsibility practices are one of the most important determinants of environmental behavior.

Table 5.  
*Hypothesis testing results*

Hypothesis	Effect ( $\beta$ )	t-value	p-value	Decision	VIF	f <sup>2</sup>
H1: PEQ → EE	0.467	9.588	P<0.01	Supported	1.096	0.289
H2: EA → EE	0.164	2.585	P<0.01	Supported	1.096	0.035
H3: DSR → PEB	0.532	10.164	P<0.01	Supported	1.269	0.388
H4: EE → AF	0.651	5.787	P<0.01	Supported	1.000	0.653
H5: EE → CO	0.722	7.734	P<0.01	Supported	1.000	0.983
H6: EE → AC	0.843	16.403	P<0.01	Supported	1.000	2.864
H7: EE → DSR	0.455	7.741	P<0.01	Supported	1.000	0.269
H8: EE → PEB	0.213	3.869	P<0.01	Supported	1.269	0.068
H9: PEQ → EE → PEB	0.100	3.277	0.001	Partial Mediation	—	—
H10: EA → EE → PEB	0.035	1.801	0.072	Not supported	—	—

According to Figure 3; the effects of the Environmental Engagement variable on AF ( $\beta=0.651$ ), CO ( $\beta=0.722$ ), and AC ( $\beta=0.843$ ) are quite high and significant. In particular, the effect size on AC ( $f^2=2.864$ ) indicates a very strong effect. Similarly, the effects of Environmental Engagement on DSR ( $\beta=0.455$ ) and PEB ( $\beta=0.213$ ) are also significant. However, the direct effect size on PEB is small ( $f^2=0.068$ ), and this suggests that indirect mechanisms may be more dominant in the formation of the behavior.

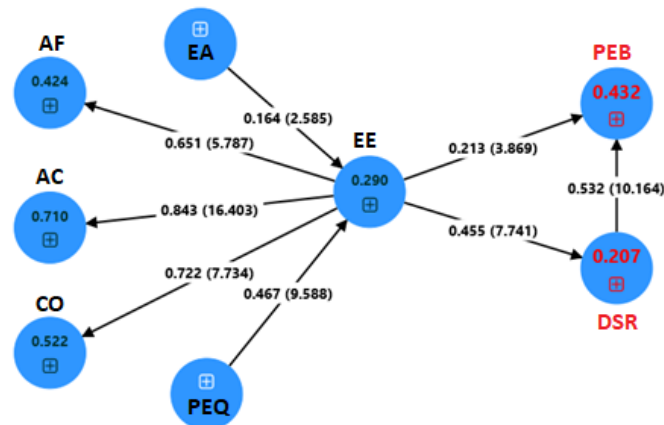


Figure 3. Structural model

According to the mediation analysis, the indirect effect of PEQ on PEB through EE. EE is significant ( $\beta=0.100$ ;  $p=0.001$ ) and highlights partial mediation. This finding indicates that the perception of environmental quality affects behavior directly and indirectly through engagement. In contrast, the indirect effect of Environmental Awareness (EA) was found to be insignificant ( $p=0.072$ ). This reveals that awareness alone does not transform into behavior; engagement and social responsibility mechanisms are more determinant. Overall, the results regarding the model indicate that environmental engagement is a central variable in the context of parks and strongly influences psychological dimensions (AF, AC, CO), social responsibility and pro-environmental behavior.

#### 4.4. Importance-Performance Mapping

Importance–Performance Map Analysis (IPMA), as an extension of the PLS-SEM approach developed by Hermann Wold, allows for the evaluation of total effect values in the structural model together with the mean performance scores of latent variables. The primary purpose of IPMA is to demonstrate the statistical significance of the relationship between variables as well as to identify which variables constitute the priority areas for managerial intervention. In this respect, the analysis goes beyond classical path coefficients and offers a strategic prioritisation tool for decision makers (Ringle & Sarstedt, 2016; Hair et al., 2022).

The IPMA results of this study, presented in Figure 4, indicate that Destination Social Responsibility has the highest importance level and its performance is relatively high. This finding reveals that social responsibility practices in park management (environmental protection projects, public awareness activities, and sustainability policies) play a critical role in promoting pro-environmental behavior. The Environmental Engagement variable, on the

other hand, stands out as a core area that requires managerial development, exhibiting high importance but relatively lower performance. This highlights the need to increase visitors' engagement in decision-making processes, expand volunteer environmental activities, and develop interactive information applications.

The moderate importance and performance level of Perceived Environmental Quality (including the dimensions of affect, activation, and cognitive processing) indicates that the elements regarding physical environment arrangements and psychological experience should be improved in a balanced manner. Environmental Awareness, on the other hand, indicates high performance but low importance value, and this suggests that the current level of awareness is sufficient, but its impact on behavioral outcomes is relatively limited.

Consequently, IPMA serves as a powerful managerial decision support tool in park and destination management, enabling the optimisation of resource allocation, determining which variables require investment, and strengthening sustainable environmental policies.

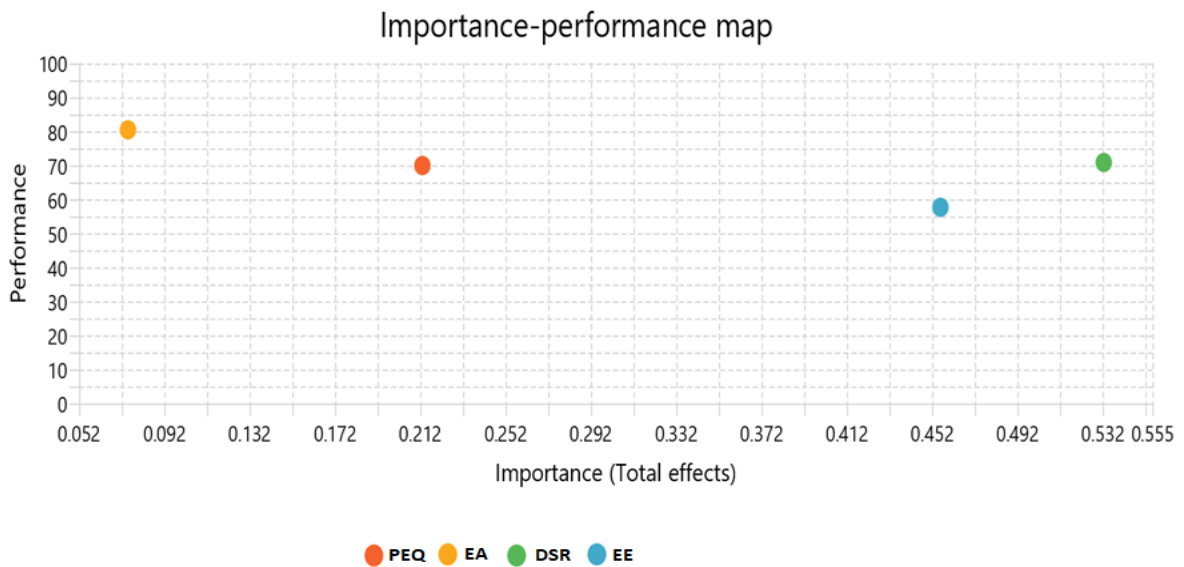


Figure 4. Importance–Performance Map Analysis (IPMA)

## 5. CONCLUSION AND DISCUSSION

This research examines the formation process of pro-environmental behaviors in urban recreational areas using a holistic model and reveals that environmental engagement assumes a central and determining role in this process. The findings indicate that perceived environmental quality and environmental awareness have significant and positive effects on environmental engagement, and environmental engagement directly and indirectly shapes destination social responsibility perceptions and pro-environmental behaviors. These results demonstrate that

pro-environmental behaviors cannot be explained by cognitive awareness level alone, that they are a multidimensional process supported by engagement, experience, and organisational practices. This research also lends itself to understanding through the S-O-R approach where environmental awareness and perceived quality are considered environmental stimuli, whereas the process of environmental engagement serves as an organismic process. In the same way, the results support the premises of the Theory of Planned Behavior as they demonstrate the influence of awareness and perception on behavior through evaluative and engagement processes.

The findings obtained with this study show significant parallelism with the literature. In particular, the impact of individuals' psychological bond with the environment and experiential processes on pro-environmental behaviors is also supported by previous studies. Indeed, it is stated that the connection established with the place increases individuals' pro-environmental behaviors, and that this relationship often occurs through intermediary mechanisms (Yoon et al., 2024). Similarly, the finding that environmental experiences and perceived environmental characteristics trigger emotional and cognitive processes in individuals, and thus guide their behavior, aligns with the results of the present study (Zhou et al., 2023).

However, the fact that environmental awareness does not directly transform into behavior confirms the awareness-behaviour gap often highlighted in the literature. Studies suggesting that environmental knowledge and attitudes alone are not enough to produce behavior and that intermediary variables play a critical role in this process support the findings of this research (Yoon et al., 2024). This clearly demonstrates that raising awareness is not sufficient in developing sustainable behaviors alone, and mechanisms that ensure active engagement by individuals are essential.

On the other hand, this study differs from existing literature in some respects. While the literature often focuses on the elements of place attachment or physical environment (Moulay et al., 2018), environmental engagement was considered as a multidimensional structure in this research and placed at the centre of the model. Evaluating environmental engagement together with its affective, cognitive processing, and activation dimensions enables a more comprehensive understanding of individuals' relationships with the environment. Additionally, demonstrating the strong impact of destination social responsibility on pro-environmental behavior makes an important contribution as it draws attention to the institutional dimension, which has been limitedly addressed in the literature.

On the other hand, when compared to studies highlighting park user satisfaction and the importance of physical facilities (Alkan, 2019), this research has a significant difference as it focuses on physical environment characteristics and psychological and behavioral processes. This demonstrates that when evaluating urban parks, physical quality and satisfaction should be considered, together with individuals' levels of engagement and their perceptions of social responsibility.

Consequently, this study makes theoretical and practical contributions to the literature by demonstrating that environmental engagement is a critical intermediary and determining mechanism in the formation of pro-environmental behaviors. It is recommended based on the research findings that park and destination management should focus on both awareness-raising practices and holistic strategies that encourage active engagement from individuals and are supported by corporate social responsibility initiatives. In this respect, this study contributes to the academic literature in terms of sustainable environmental management and offers strategic implications for practitioners.

While there are strengths to this study, there are some limitations. First, it was conducted only using one urban park setting and the use of cross-sectional surveys may have affected its applicability. Further studies may explore the viability of applying this model in varying urban or natural park settings.

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