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The effect of environmental knowledge on green purchasing behavior of spectators: The mediating role of ethical commitment to the environment

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ABSTRACT

The main purpose of this research was to examine the effect of environmental knowledge on the green purchasing behaviour of equestrian competition spectators, with the mediating role of ethical commitment to the environment. This study was a descriptive correlational investigation, and its statistical population comprised all spectators of the Gonbad-Kavos autumn equestrian competition in 2024. Based on the method proposed by Mueller (2012) for structural equation modelling, the sample size was estimated at 160 spectators. The instruments used to collect data included the Environmental Knowledge Questionnaire by Liang et al. (2016), the Ethical Commitment to Environment Questionnaire by Cui et al. (2024), and the Green Purchasing Behaviour Questionnaire by Kim et al. (2013). The face and content validity of these questionnaires were reviewed and confirmed by five experts in sports management. In a preliminary study, Cronbach's alpha values for the questionnaire variables were 0.77, 0.82, and 0.79, indicating satisfactory reliability. Descriptive and inferential statistics were used to analyse the data. The results showed that environmental knowledge has a positive and significant effect on the ethical commitment to the environment among equestrian competition spectators. Additionally, the effect of environmental knowledge on the green purchasing behaviour of these spectators was also positive and significant. Finally, the findings demonstrated that environmental knowledge positively and significantly influences green purchasing behaviour with the mediating role of ethical commitment. Therefore, it can be concluded that increasing the environmental knowledge of equestrian competition spectators can lead to positive outcomes, such as enhanced ethical commitment to the environment and increased green purchasing behaviour.

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1. Introduction

In recent years, despite the establishment of various treaties and commitments at the international level, environmental problems and challenges have increased alarmingly. The natural stability and sustainability of the environment are being destroyed more than ever due to irresponsible human behaviors (Rasowo et al., 2024). The health of the Earth faces unprecedented threats, and the destructive effects of industrialization on all parts of nature are clearly evident (Wood Hansen & Van Den Bergh, 2024). Furthermore, as human actions continue to impact the environment, the resulting consequences—including the decline of the clean climate index—have accelerated and intensified, significantly affecting public health, economic conditions, and the daily lives of individuals (Simiyu et al., 2022). Therefore, over the past decade, despite the formulation and enforcement of numerous environmental laws and regulations by responsible organizations, promoting a culture of environmental values through awareness and emphasizing preservation for future generations has become an effective and low-cost strategy (Murali et al., 2019). In this context, within the sports industry, the environmental threats posed by hosting sports events—often accompanied by large crowds of spectators—have become a major concern for host communities and environmental activists. This has led to increased activity by environmentally focused non-governmental organizations (NGOs) and the development of campaigns and eco-friendly approaches to organizing sports events (Lyu, 2024). Despite considerable opposition, sporting events remain a top priority for organizers, especially large-scale events, due to their sustainable economic and social benefits. Consequently, these priorities have often overshadowed environmental considerations within the industry (Shahvali et al., 2023).

The tangible and intangible benefits of hosting sporting events include creating sustainable social structures, developing urban infrastructure and facilities, increasing tourism, improving public welfare, revitalizing societal morale and vitality, enhancing cultural values, and raising environmental awareness within communities (Hemmati et al., 2023). Studies on various events, including sporting events, have demonstrated that promoting green behaviors and fostering spectators' interest in behavioral and attitudinal changes can be achieved through environmental awareness and behavioral training focused on eco-friendly practices (Badri Azarin et al., 2023; Shahvali et al., 2023). Green purchasing behavior refers to the conscious selection of products that have a reduced negative impact on the environment or contribute to environmental preservation. This behavior encompasses actions such as saving energy, reducing waste, and using recycled or renewable products (Putri & Hayu, 2024). In this context, one factor that has proven effective in creating a positive mental image and encouraging reuse intentions among event participants—and has attracted marketers' attention—is the promotion of environmentally friendly or green products. This approach aims to advance the social and economic outcomes of green marketing principles in sports tournaments (Murali et al., 2019).

Numerous studies indicate that providing knowledge and raising awareness about environmental values and the importance of maintaining a clean environment not only increases people's sensitivity to these issues but also strengthens green behavioral patterns and promotes adherence to these behaviors within a social context (Ghodasnejad & Bidokhti, 2020). Hof et al. (2018) state that with the intensification of environmental degradation consequences—such as global warming, extreme weather events, and ecosystem loss—there is an urgent need to increase the awareness and responsibility of governments, organizations, and individuals worldwide to address these challenges. Zaizay et al. (2025) consider education the starting point for actions related to environmental conservation and preservation. Accordingly, education is one of the

most effective ways to tackle environmental problems and shape a sustainable future for the Earth. It equips individuals with the knowledge, skills, and values necessary to understand and address complex environmental challenges, including climate change, pollution, biodiversity loss, and resource depletion, thereby enhancing their capacity to care for the environment (Wu et al., 2023). Additionally, educational programs play a crucial role in increasing environmental knowledge and promoting a culture of green living by providing targeted, practical, and actionable information (Van De Wetering et al., 2022). Environmental knowledge is defined as the ability to recognize symbols, concepts, and behavioral patterns related to environmental protection based on the information received (Onder & Kocaeren, 2015). Taufique et al. (2016) define environmental knowledge as awareness of environmental problems and the ability to find possible solutions to address them. Otto and Pensini (2017) also emphasize that environmental knowledge is vital for promoting pro-environmental behaviors, helping individuals understand what actions to take to behave in a more environmentally friendly manner. A review of studies on the behavioral patterns of sports tourists confirms that a lack of environmental knowledge and training to comply with green management behaviors—manifested as an environmental culture—is a fundamental barrier to preserving the environmental values of host communities.

Considering that sporting events have a strong ability to attract large numbers of both active and inactive tourists, senior managers and league organizations can leverage this phenomenon to promote green purchasing behaviors and thereby host environmentally friendly sporting events (Sepahvand et al., 2019). This approach requires, on one hand, the establishment of environmentally friendly regulations for sports venues, including the design, construction, and equipping of facilities using green materials (Shahbazi et al., 2019). On the other hand, it involves educating consumers about green purchasing and encouraging the consumption of products that are easily and quickly recyclable and compliant with environmental ISO standards (Makki Jebur et al., 2023). According to Ghodsnejad and Aminbidokhti (2020), environmental education and green behaviors play a crucial role in addressing environmental crises. Environmental values education has become a cultural and behavioral norm aligned with activities involving large crowds, by positively shaping individuals' attitudes, values, skills, understanding, and interests toward environmental values. It also fosters the necessary skills and attitudes to appreciate the indigenous and biophysical values of societies. The decline in air quality and increased sensitivity to waste and natural resource depletion are major concerns in environmental management. It is estimated that over seven million people worldwide die annually due to air pollution (Rehman et al., 2021). The rising mortality rates caused by unhealthy environmental conditions, especially among vulnerable groups such as children and the elderly, are alarming and can no longer be dismissed as minor issues (Amoah & Addoah, 2021). In this context, where environmental changes are accelerating and their destructive consequences are intensifying, long-term commitment to environmental preservation and sustainable resource use has become a global imperative (Ji et al., 2022). Hof et al. (2018) emphasize that with the worsening effects of environmental degradation—such as global warming, extreme weather events, and ecosystem loss—there is an urgent need to raise awareness and responsibility among governments, organizations, and individuals worldwide to address these challenges. The importance of environmental education lies in its significant impact on individuals' green behaviors, including green purchasing behavior. Green purchasing behavior involves choosing products that are environmentally friendly, beneficial, recyclable or

recoverable, and sensitive to environmental concerns (Mostafa et al., 2007).

According to studies, environmental awareness education can enhance green purchasing behaviors by fostering individuals' environmentally committed attitudes (Ji et al., 2022; Cui & Wang, 2024). Research conducted in the context of sports events indicates that, due to the significant influence of these events on participation and social acceptance, the anticipation of green products can strengthen the relationship between attitudes toward green products and the intention to purchase and reuse them among spectators, ultimately leading to the development of environmental moral commitment (Shafie et al., 2023). Environmental education promotes the reinforcement and expression of such moral commitment behaviors, which encompass broad beliefs and attitudes grounded in environmental responsibility and values. These include the responsible use of natural resources, attention to the renewable characteristics of consumer goods, and efforts to reduce pollution and environmental degradation (Abroudi & Cheraghali, 2021). Zhang et al. (2024) found that supportive approaches influence environmental attitudes and are linked to individuals' willingness to take action to protect the environment. Thus, environmental values can guide individuals' behaviors through attitudes. However, to achieve the goals of green behaviors, a comprehensive approach to environmental education aligned with the World Environment Organization's Environmental Education Charter is essential. This approach includes five dimensions: environmental knowledge and awareness of the entire environment and its issues; acquisition of values, emotions, and motivation related to the environment; extensive participation in solving environmental problems; development of environmental skills necessary to identify and address these problems; and, ultimately, maximum participation in preserving and improving the environment (Shahvali et al., 2023). Shafie et al. (2023) argue that green management and green marketing are complementary strategies. Therefore, both producers and consumers should support the supply of green products. Although producing a completely green product is not feasible, product designs should incorporate features that conserve energy resources and reduce or eliminate pollution, waste, and toxic factors—behaviors that reflect ethical commitment in sports marketing. In this context, Seif et al. (2016) emphasized that investing in customers' environmental knowledge and awareness through products and services in the global competitive market creates a competitive advantage, significantly impacting customer repurchase loyalty and expanding acceptance of green market products.

The equestrian complexes of Golestan Province, as the center of the country's horse industry, exemplify the strong connection between the cultural and historical values of Turkmen residents and sports events. Leveraging the natural attractions of Golestan Province, these complexes possess a unique capacity to attract both domestic and international tourists. Moreover, sports events rooted in the lifestyle and cultural values of communities not only foster high social participation but also enjoy a distinctive level of acceptance (Ghezelseloo et al., 2023). By incorporating ecological objectives into the provision of sports products and the design of sports venues, it is possible to reduce resource consumption and pollution while enhancing the preservation of scarce environmental resources. Therefore, the equestrian complexes of Golestan Province serve as an ideal platform where environmental education is not only an effective strategy for promoting an environmentally friendly culture but also, given the shared cultural heritage with countries bordering the Caspian Sea, a powerful incentive to strengthen green behaviors and encourage participants' loyalty to return to these events. This study examines the effect of environmental knowledge on the green purchasing behavior of spectators at equestrian competitions, with moral commitment to the environment serving as a mediating factor.

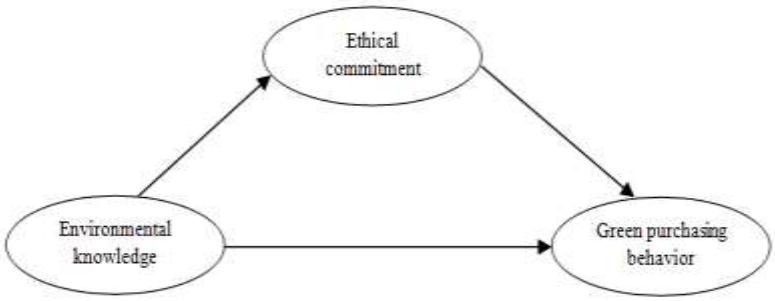

Figure 1. Conceptual Research Model

2. Methodology

This research adopts relativist ontology, positing that reality exists in a subjective and relative form that varies according to culture, language, and individual experience. Epistemologically, it employs a phenomenological approach, emphasizing the examination of individual experiences and subjective perceptions of phenomena. The study is applied in purpose and descriptive in terms of data collection, utilizing a correlational design. The statistical population comprised spectators of the Gonbad Kavoos Autumn Course equestrian competitions in 2024. To determine the sample size, the rule of 10 coefficient developed by Mueller (2012) was applied. This rule involves multiplying the variable with the highest number of items by 10. Since the environmental knowledge variable contained the most items (16), the sample size was calculated as 160 spectators. Questionnaires were distributed conveniently among the research sample during the sixth week of the Gonbad Kavoos Autumn Course Equestrian Competition. Data collection was conducted using three standardized questionnaires, which are described in detail below:

Environmental Knowledge: The questionnaire developed by Liang et al. (2016) was used to assess environmental knowledge. This instrument consists of 16 items and employs a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Liang et al. (2016) reported a Cronbach's alpha of 0.91 for this questionnaire, indicating excellent reliability.

Ethical Commitment: The questionnaire developed by Cui et al. (2024) was used to measure the ethical commitment variable. This instrument consists of three items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Cui et al. (2024) reported a Cronbach's alpha of 0.89 for this tool, indicating its high reliability.

Green Purchasing Behavior: The Kim et al. (2013) questionnaire was used to assess the green purchasing behavior variable. This standardized tool consists of 4 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Kim et al. (2013) reported a Cronbach's alpha of 0.91 for this instrument, indicating high reliability. To establish face validity, the questionnaire was reviewed by five sports management experts, and modifications were made to the wording of some items based on their feedback. Additionally, the Content Validity Index (CVI), as introduced by Waltz and Bausell (1981), was employed to evaluate the validity of the questionnaire. Experts rated each item's relevance, simplicity, and clarity using a 4-point Likert scale. Relevance was scored as 1 = not relevant, 2 = somewhat relevant, 3 = relevant, and 4 = highly relevant. Simplicity was rated as 1 = not simple, 2 = somewhat simple, 3 = simple, and 4 = very simple. Clarity was assessed as 1 = not clear, 2 = somewhat clear, 3 = clear, and 4 = very clear. The CVI for each item was calculated by dividing the number of experts who rated the item as 3 or 4 by the total number of

experts. Formula 1 illustrates the calculation of the CVI, which ranges from 0 to 1.

The CVI values calculated for the variables of environmental knowledge, ethical commitment to the environment, and green purchasing behavior were 0.92, 0.96, and 0.90, respectively. These values are acceptable as they exceed the baseline threshold of 0.79. To assess the reliability of the questionnaires, a preliminary study was conducted in which 40 spectators of the Gonbad-Kavoos autumn horse riding competitions completed the developed questionnaires during the third week of the event. Analysis using Cronbach's alpha yielded internal consistency estimates of 0.77, 0.82, and 0.79 for environmental knowledge, ethical commitment, and green purchasing behavior, respectively. These values indicate satisfactory reliability of the instruments. It is worth noting that the slightly lower Cronbach's alpha values compared to the original questionnaires may be attributed to factors such as differences in sample size between the current and previous studies, minor modifications in questionnaire item wording, and cultural variations. Nevertheless, all values remain above the acceptable threshold of 0.7, confirming the reliability of the instruments used. Following the finalization of the research questionnaires and coordination with the Gonbad-Kavoos Sports and Youth Department, data collection was conducted during the sixth week of the Gonbad-Kavoos Autumn Horse Riding Competition. Printed questionnaires were distributed to willing spectators prior to the start of the competitions that week. The research team explained the purpose of the study and provided instructions on how to complete the questionnaires to ensure informed participation. For data analysis, both descriptive statistics (frequencies, means, and standard deviations) and inferential statistics (structural equation modeling) were employed. SPSS version 25 and SmartPLS version 4 statistical software were used for these analyses.

Table 1. Research methodology based on the research onion model

Layers	Type
Philosiphy	Positivism
Approache	Inductive
Strategy	Survey
Choice	Mono Method
Time Horizon	Cross-Sectional
Technique and Procedure	Data Collection and Analysis

3. Research Findings

The descriptive results regarding the demographic characteristics of the study sample indicated that most participants were aged 41 years and above (124 spectators). Additionally, analysis of the educational background of the respondents revealed that a bachelor's degree was the most common level of education (81 spectators). Furthermore, the demographic analysis showed that the majority of the sample had attended equestrian competitions for 11 years or more (109 spectators). All 160 spectators selected for the study were men, due to restrictions on women entering the equestrian competition track. The highest frequency of income among participants fell within the 11 to 20 million Tomans range. Table 2 presents the results of the descriptive analyses conducted on the research variables. The findings indicate that the mean and standard deviation for environmental knowledge, ethical commitment to the environment, and green purchasing behavior were 3.51 ± 0.72, 3.41 ± 0.82, and 3.54 ± 0.84, respectively.

In the inferential results section, the quality of the research model was first evaluated using indicators from both the measurement model and the structural model, as explained below:

– **Measurement Model**

In the measurement model section, the quality of the research model was assessed based on criteria such as reliability and validity (both convergent and discriminant). Composite reliability indices, Cronbach's alpha, and factor loadings were among the criteria used to evaluate the research measurement model. The composite

reliability coefficients and Cronbach's alpha values calculated for each variable should exceed 0.7 (Hair et al., 2014), as confirmed by the coefficients reported in Table 3. In Figure 2, the factor loading values, as well as the beta coefficients representing the effects between variables, are presented. The factor loadings obtained for each construct should be higher than 0.7 (Rajabi et al., 2023), which Figure 2 confirms, as these values exceed the baseline threshold of 0.7. It is worth noting that items 1, 4, 11, and 12 of the Environmental Knowledge Questionnaire were removed due to their low factor loadings, falling below the 0.7 threshold. Rajabi et al. (2023) state that factor loadings indicate the degree of influence each observed variable (indicator) has on a latent variable, and factor loadings above 0.7 generally mean that the observed variable can explain a significant portion of the variance in the latent variable. This level of factor loading indicates the importance and high predictive power of the observed variables.

Considering the results in Table 3 and the factor loadings of each item shown in Figure 2, it can be concluded that the research measurement model demonstrates acceptable reliability.

To assess the convergent validity of the variables in the research measurement model, the average variance extracted (AVE) was used. Additionally, the Heterotrait-Monotrait (HTMT) ratio was employed to evaluate discriminant validity. For each variable, the AVE should exceed 0.5, and the HTMT ratio should be below the threshold of 0.85 (Rajabi et al., 2023). The statistics presented in Table 4 confirm the adequacy of both convergent and discriminant validity for the variables in the structural model.

– **Structural Model**

To evaluate the quality of the research's structural model, the following indices were used: R^2 (coefficient of determination), VIF (variance inflation factor for collinearity), SRMR (standardized root mean square residual), Q^2 (predictive relevance), and GOF (goodness of fit).

For the R^2 index, or coefficient of determination, values of 0.19, 0.33, and 0.67 have been proposed as criteria for weak, moderate, and strong fit of the structural part of the model, respectively (Hair et al., 2019). According to the results in Table 5, the R^2 values for the variables ethical commitment to the environment (0.551) and green purchasing behavior (0.857) indicate a good fit. Additionally, Table 5 shows that the variance inflation factor (VIF) for the research model is 1.817, which is below the threshold of 3, indicating no multicollinearity issues (Rajabi et al., 2023). The acceptable value for the standardized root mean square residual (SRMR) index is less than 0.08 (Hair et al., 2019). The SRMR value reported in Table 5 is 0.072, confirming the model's adequacy.

A structural model developed in SmartPLS should demonstrate adequate predictive power, which is assessed using the coefficient of determination (Q^2). Q^2 values of 0.02, 0.15, and 0.35 indicate weak, moderate, and strong predictive power for each variable in the structural model, respectively (Henseler et al., 2015). The coefficient of determination is estimated using the sum of squares of observations (SSO) and the sum of squared errors (SSE) for each latent variable block. In PLS-SEM models, the SSO represents the total variance in the observed data, reflecting the sum of squared deviations in the observations. This index measures the overall variance present in the input data. Conversely, the SSE quantifies the sum of squared differences between the actual and predicted values of the model, serving as an indicator of predictive accuracy. A lower SSE value corresponds to higher predictive accuracy. Based on the results presented in Table 6, it can be concluded that the variables in this study exhibit good convergent validity, and the predictive power of the research model is confirmed.

To evaluate the structural model in this research, the General Goodness of Fit (GOF) criterion is used in Partial Least Squares (PLS) analysis. The GOF is calculated using a specific

formula and is categorized into three levels: poor, moderate, and good, corresponding to values of 0.01, 0.25, and 0.36, respectively (Hair et al., 2014). The commonality index is derived from the average factor loadings of the constructs in the model. In this study, the average factor loading for the commonality index was calculated as 0.847. The R^2 index, also known as the coefficient of determination, indicates the proportion of variance in the dependent variable explained by the independent variable(s). In this study, the R^2 values were 0.551 for ethical commitment and 0.857 for green purchasing behavior, resulting in an overall R^2 of 0.704. Using the aforementioned formula, the overall fit index of the structural model was calculated as 0.772, indicating a good fit for the research model.

After establishing confidence in the quality of both the measurement and structural models of the research, the hypotheses were tested, with the results presented in Table 7. The study findings indicate that environmental knowledge has a positive and significant effect on the ethical commitment to the environment among equestrian competition spectators ($\beta = 0.742$, $t = 17.210$). Additionally, environmental knowledge positively and significantly influences the green purchasing behavior of these spectators ($\beta = 0.888$, $t = 24.113$). Finally, the bootstrap method was employed to examine the mediating role of ethical commitment. The results demonstrated that environmental knowledge positively and significantly affects green purchasing behavior through the mediating role of ethical commitment to the environment ($\beta = 0.163$, $t = 3.014$). It is worth noting that Figure 3 displays the t-values associated with the effects between variables.

To examine the relationships between the research variables across different age groups and to identify any differences among them, a multi-group analysis (MGA) was conducted. The results, presented in Table 8, indicate that the relationships between the research variables among the age groups (20 to 30 years, 31 to 40 years, and 41 years and above) were not statistically significant.

Table 2. Description of research variables

Variable	Statistics		
	Number	Mean	Standard Deviation
Environmental Knowledge (EK)	160	3.59	0.80
Ethical Commitment to the Environment (EC)	160	3.41	0.82
Green Purchase Behavior (GPB)	160	3.54	0.84

Table 3. Reliability Indicators of the Research Structural Model

Variable	Cronbach's Alpha	Composite Reliability
Environmental Knowledge	0.959	0.964
Ethical Commitment to the Environment	0.785	0.870
Green Purchase Behavior	0.938	.956

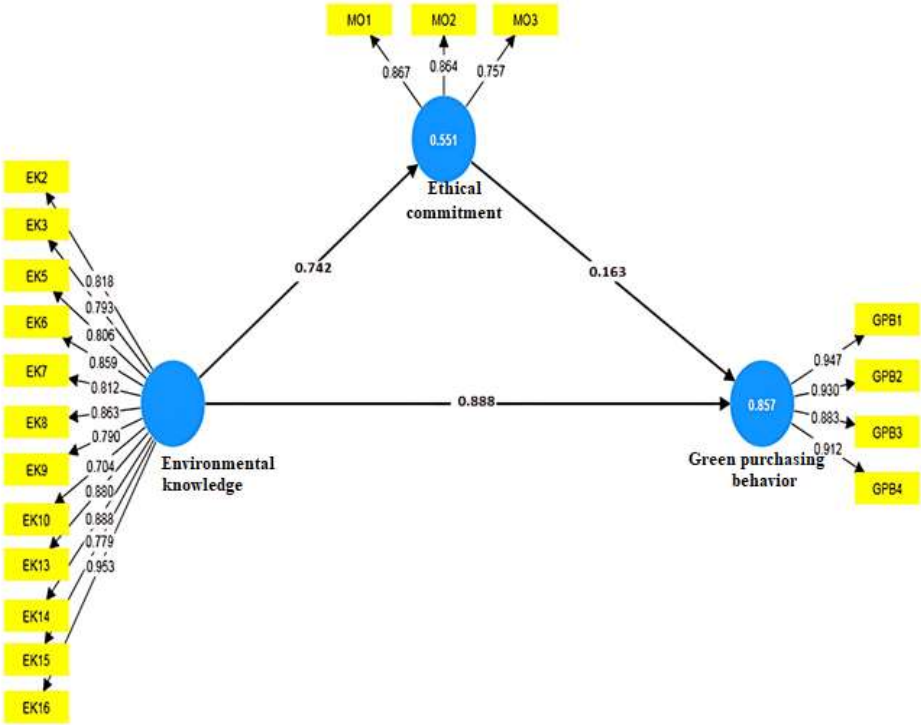

Figure 2. Research model tested using standard estimation mode

Table 4. Validity Indicators of the Research Structural Model

Row	Variable	1	2	3	Average Variance Extracted
1	**Ethical Commitment**				0.691
2	**Environmental Knowledge**	0.804			0.690
3	**Green Purchase Behavior**	0.783	0.872		0.844

Table 5. Selected Indicators for Evaluating the Research Structural Model

Index	Variable	Statistic	Status
R^2	**Ethical Commitment**	0.551	Accepted
	Green Purchase Behavior	0.857	Accepted
VIF	-	1.817	Accepted
SRMR	-	0.072	Accepted

Table 6. Cross-Validation Redundancy of Indicators

Variable	1-SSE/SSO	SSE	SSO	Predict Power
Ethical Commitment	0.505	425.487	860	Strong
Green Purchase Behavior	0.489	719.567	1410	Strong

Table 7. Direct and Indirect Effects in Model

Effects in Model	SD	β	t	Sig
Environmental Knowledg -> Ethical Commitment to the Environment	0.043	0.742	17.210	0.001
Environmental Knowledge -> Green Purchase Behavior	0.037	0.888	24.113	0.001
Environmental Knowledge -> Green Purchase Behavior with mediating role of Ethical Commitment to the Environment	0.047	0.163	3.014	0.001

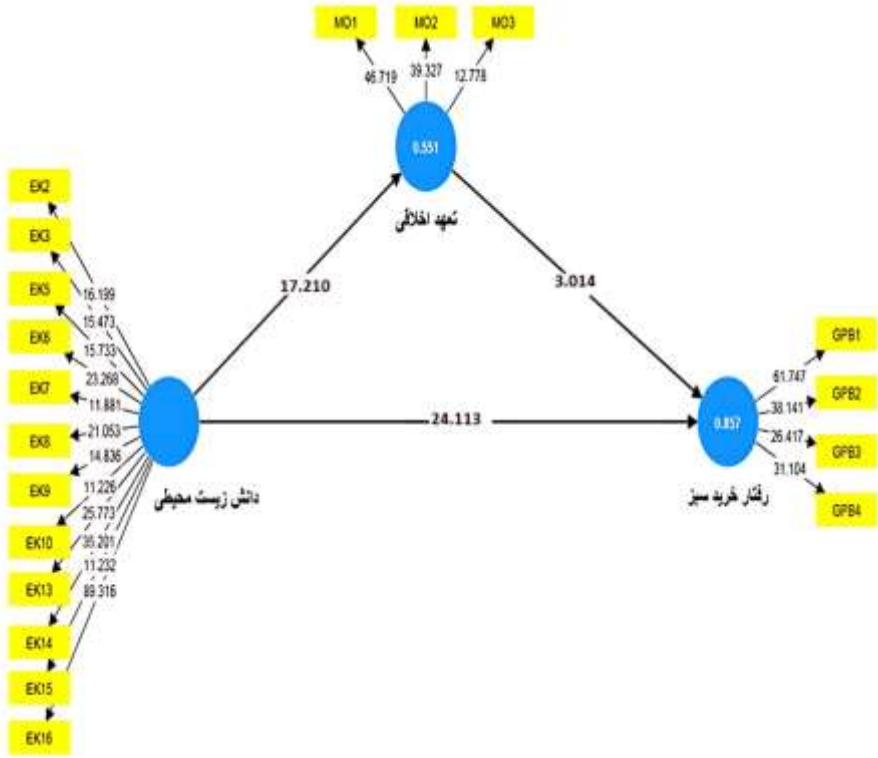

Figure 3. Tested research model in the case of significant numbers

Table 8. Multigroup Analysis Examining Relationships Between Variables Based on

Effects in Model	Difference between the age groups 20 to 30 years and 31 to 40 years	Differences Between the Age Groups 20–30 Years and 41 Years and Older	Difference between the age groups 31 to 40 years and 41 years or older	Significance level comparing the age group 20 to 30 years with the age group 31 to 40 years	Significance level comparing the age group 20 to 30 years with the age group 41 years and older	Significance level comparing the age group 31 to 40 years with the age group 41 years and older
EK -> EC	0.032	0.024	0.008	0.756	0.761	0.978
EK -> GPB	0.228	0.146	-0.082	0.100	0.320	0.345
EK -> GPB with mediating role of EC	-0.325	-0.151	0.174	0.059	0.473	0.105

4. Discussion and Conclusion

Environmental awareness and the promotion of green thinking among consumers—based on knowledge, attitudes, and social behaviors—are crucial issues in marketing environmentally friendly products. These concerns have become a top priority for organizers and social activists at crowded events, particularly within the sports event industry, over the past decade (Shahbazi et al., 2019). Therefore, the present study aimed to examine the effect of environmental knowledge on the green purchasing behavior of equestrian competition spectators, with the mediating role of ethical commitment to the environment. The results indicated that environmental knowledge has a positive and significant impact on the green purchasing behavior of equestrian competition spectators, consistent with the findings of Badri et al. (2023), Zhang et al. (2025), Movahed et al.(2025, Ghezelseloo et al. (2023), Makki et al. (2022), Darvishi et al. (2021), Baghban et al. (2021) , and Hossein Marvi et al. (2021). In a study aligned with the present research, Badri et al. (2023) highlighted the interaction between the event industry and the environment, reporting that the development of environmental knowledge—when it leads to the advancement of green infrastructure and the host environment—can establish the requirements and a systematic framework for fostering a pro-environmental culture in sports. This approach is considered an effective strategy for the sustainable development of sports events and the green management of behaviors among sports competition participants. To this end, environmental awareness should be widely promoted in areas such as clean air, the food industry, smart waste disposal, transportation, and renewable energy at sports venues, leveraging the capacity of media and sports events to cultivate environmentally friendly consumer behaviors. Shahbazi et al. (2020) also noted, in their typology of green behaviors in sports venues, that because sports events generate high social participation from all segments of society, this influence can be harnessed to address critical environmental challenges and develop environmental infrastructure. Accordingly, macro-level policies aligned with environmental protection regulations should be designed by sports institutions, and awareness should be raised within sports environments. Furthermore, any policymaking and planning for the country's future economic, social, and cultural development must be grounded in environmental protection and sustainable development principles. The extent to which these goals are achieved depends primarily on the advancement of environmental knowledge and the strengthening of environmental belonging among all participants in sports events, ensuring that green behavior is institutionalized at all levels by managers, employees, spectators, and other stakeholders of sports organizations. Reason: The text was revised to improve clarity, coherence, and readability by restructuring sentences and enhancing vocabulary. Grammar, punctuation, and citation formatting were corrected for consistency and accuracy. Technical terms were clarified, and the flow of ideas was improved to better convey the study's objectives, findings, and implications within the context of environmental awareness in sports events.

In this regard, Ghezelseloo et al. (2023) emphasized the significant role of equestrian sports events in the sustainable development of indigenous Turkmen communities in the Turkmen Sahara. They stated that ecotourism, characterized by environmental capabilities and nature-oriented attractions, constitutes the two main dimensions driving the development of the tourism industry associated with equestrian complexes in Golestan Province. These complexes attract a large number of tourists annually through cultural sports festivals. Therefore, organizing environmental festivals alongside horse racing competitions and promoting environmental values through horse

racing champions and celebrities can have lasting effects on fostering green purchasing behavior and encouraging commitment to these practices. Hossein Marvi et al. (2021), in examining the barriers affecting green purchasing by customers, reported that the creation of local organic consumer associations, along with attention to the safety aspects of green purchasing behavior through the provision of environmental knowledge packages, can play a pivotal role in promoting social health. Similarly, Maki et al. (2022) stated that the incidence of green behavior among consumers is a function of their level of environmental knowledge and the perceived importance of the consequences of purchasing these products on their living and surrounding environment. In fact, the post-purchase behaviors of environmental supporters—such as usage behaviors, evaluation behaviors, and product disposal behaviors—can determine the conditions for repurchasing and future use of green products. Therefore, it is predictable that customers will exhibit different green behaviors after purchasing green products. Consequently, the behavioral expectations of green consumers should be considered throughout the purchase process, the manner in which they use the products, and how they dispose of them, enabling product suppliers to encourage greater future participation from consumers. Sepahvand and Momeni (2018) consider the foundation of green behaviors among consumers of sports events to be the development of environmental knowledge among organizers and human resources. They argue that environmental knowledge should not be limited to sports tourists but should also include design and construction teams, service groups at the event, and host communities. In this context, green management of human resources knowledge—encompassing green attitudes, green mental acceptance, green equipment, and efforts to create and develop a culture of green use of sports venues—can guide sports consumers' green purchasing behavior toward goals aligned with environmental protection, consistent with the findings of the present study. To explain this category, we can refer to the theory of planned behavior, which posits that beliefs, behaviors, and the evaluation of the outcomes of repeating these behaviors can create a favorable attitude toward repeating the behavior in an individual. Specifically, normative beliefs and the motivation to fulfill the normative expectations of others are reflected in the mental norm, while control beliefs determine perceived behavioral control. In general, attitudes toward behavior, mental norms, and perceived behavioral control lead to the formation of the intention to repeat the behavior (Seif et al., 2016). Therefore, based on the research findings, it is recommended that managers of equestrian complexes and organizers of racecourse competitions promote green purchasing behaviors by establishing memorandums of understanding with environmental organizations. They should also develop packages that include environmental information and its impacts, and present these to customers. Additionally, it is suggested to offer incentive packages such as discounts on competition tickets, designate green spectator areas for environmentally conscious tourists, and use eco-friendly food packaging.

The primary environmental concerns on race day appear to be the transportation system and the excessive traffic caused by spectators. Therefore, it is recommended that the municipal urban transportation management address these environmental threats to maintain clean air by establishing multiple stations and alternative routes leading to the equestrian complexes. Encouraging the use of public transportation through routing applications and implementing traffic restrictions for personal vehicles within the equestrian complexes are also essential measures. Additionally, creating green routes, such as dedicated cycling paths, installing bicycle storage facilities at crowded sports venues, and developing green spaces along these routes are effective green management strategies. By adopting these measures, similar to many leading countries, the equestrian complexes in Golestan Province can

become the first green sports venues in the country.

Another part of the results of this study indicated that environmental knowledge, mediated by moral commitment to the environment, has a positive and significant effect on the green purchasing behavior of equestrian competition spectators. This finding is consistent with the research of Cui and Wang (2024) and Alshehri et al. (2014). Similarly, Shavali et al. (2023), in examining the environmental behaviors of sports consumers through the lens of green marketing, emphasized that increasing environmental awareness among sports consumers by strengthening environmental responsibility encourages greater attention to green practices in sports events. The use of green advertising methods, the placement of environmental labels on products, and the introduction of green brands during events significantly influence the green purchasing behavior of sports consumers, fostering commitment and loyalty. Consequently, this leads consumers to purchase environmentally friendly and compliant products, promoting renewed green participation. According to Alshehri et al. (2014), individuals' behavioral intentions, shaped by acquired knowledge and aligned mental perceptions, form the foundation for change and acceptance of new social behavioral patterns. Their research confirmed that providing environmental knowledge and awareness fosters ecological consciousness and commitment to purchasing green products by cultivating behavioral approaches consistent with a green consumer attitude.

It is clear that a significant portion of green culture promotion policies within societies falls under the responsibility of suppliers and marketers. While consumers of sports equipment and supplies are not exempt from these concerns and changes in purchasing behavior, understanding whether users of sports equipment consider environmental compatibility criteria in their choices requires studying green marketing tools and objectively identifying the characteristics of green consumers (Shavali et al., 2023). In this context, Karbasi and Rahmati (2021) argue that predicting the characteristics of ecological marketing and requiring manufacturers to comply with the standards of this marketing approach is a fundamental step in protecting the environment and reinforcing the ideology of green consumer behavior. This should be taken into account by responsible organizations when issuing permits. Putri and Hayu (2024) also emphasize that environmental values are powerful modifiers of individuals' quality of life and assert that teaching environmental knowledge from an early age has more lasting effects. Their study results indicate that providing environmental knowledge not only has a direct and significant impact on customers' green purchasing behavior but also increases customers' moral commitment to purchasing products with environmentally friendly ISO certifications by highlighting the environmental consequences observed in social life.

Considering the results of the present study, which indicated a significant effect of environmental awareness and moral commitment among horse racing spectators on green purchasing behavior, it is recommended that horse event managers and organizers comply with green food labeling and environmental ISO standards when providing all welfare services to spectators. Additionally, avoiding the use of environmentally harmful packaging, offering service packages with recyclable materials, and installing smart recycling systems are important environmental measures. Furthermore, since the equestrian complexes in Golestan Province are located adjacent to the Turkmen Desert, conditions are favorable for the installation of solar panels to supply the energy needs of these complexes.

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There is no conflict of interest.

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