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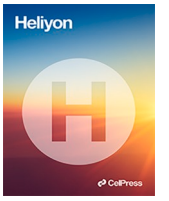

# Does pro-environmental attitude predicts pro-environmental behavior? Comparing sustainability connection in emotional and cognitive environments among football fans and university students☆

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ABSTRACT

Environmental sustainability is an imperative topic in contemporary business-related research, aiming to understand and predict how individuals' environmentally friendly behaviors can be encouraged. This research aims to empirically examine the relationship between individuals' pro-environmental attitude and pro-environmental behavior; and to compare two groups of individuals that encompass emotional and cognitive links to environmental sustainability: emotionally involved sport fans and socially conscious university students. Two studies, involving more than 1400 respondents, were conducted. Study 1 uses structural equation modelling (SEM) to test the relationship between consumers' environmental attitudes and environmental behaviors. Study 2 uses SEM multigroup analysis to compare the attitudes and behaviors of sport fans and university students. The results showed that participants' pro-environmental attitude had a positive and significant effect on pro-environmental behavior. The type of consumer plays an important role in strengthening the relationship between pro-environmental attitude and pro-environmental behavior. Despite the higher average levels of pro-environmental attitude and pro-environment behavior evidenced by the sport fans, the influence of attitude on behavior is higher on socially conscious students, the group with a more cognitive and intrinsic link with the natural environment and sustainability initiatives. Despite the positive link attitudes-behaviors, empirical insights suggest that the connection between sport fans and the club is vital to reinforce the commitment with a stronger match between attitudes and behaviors. The findings also

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have implications for practitioners and policymakers in optimizing their strategies to encourage effective pro-environmental actions.

## 1. Introduction

Environmental sustainability is imperative in contemporary business research agenda [1]. In literature, there is a strong emphasis on identifying and understanding the factors that may explain individuals' environmentally friendly decisions and behaviours [2,3]. Within this, a favorable pro-environmental attitude is a key issue to promote sustainable actions [4] and, thus, a more sustainable society through positive climate action [5]. Further, understanding consumer perspectives towards environmental sustainability is important to nudge consumers toward more sustainable choices and purchase behaviors [6]. Still, it also can inform businesses about the drivers of pro-environmental actions [7], demonstrate potential shifts in consumer preferences and expectations [8], and encourage more sustainable products and business models [5].

In sport, an increasingly relevant worldwide industry that even supports a global hierarchy of nations [9], the relationship between sport organizations and sustainability has seeing growing developments [10,11]. Sport is characterized as a high emotionally involved context between the organizations/teams (the brands) and the fans (the customers) [12], and past contributions have explored the relationship between sport and the environment in a variety of perspectives, including: the increasing efforts of professional sport teams (PSTs) in promoting pro-environmental sustainability [13–15]; the perception and participation of fans in pro-environmental initiatives carried out in sport events [11,16] and the influence of sport sustainability actions on fans' pro-environmental behaviors [10,16–18]. This line of inquiry outlines sustainable sport consumer research within the subdiscipline of sport ecology [19], in which emerging trends are primarily focused on examining the determinants of pro-environmental behaviors of sport consumers, as well as to examine the role of different personal and social elements that may help to explain fans' engagement in pro-environmental actions [20–22].

Previous applied contributions suggested that sport fans care for the environment more than non-sport fans [23] and that sport organizations should focus on environmental sustainability efforts to attract younger fans [24]. From that, two key ideas: first, emotionally involved sport context is likely to improve the effectiveness of the "pro-environmental learning process" derived from the sustainability initiatives that are being promoted [10]; second, younger publics or customers seem to rely more its choices and behaviors on pro-environmental issues than other – older – publics [20]. Further, recent research found that the club's pro-environmental sustainability initiatives have an effective impact on fans' socially, environmentally, and economically favorable behaviors, suggesting that the strong affective and emotional link between the fan and the club encourages favorable behaviors on a triple bottom line perspective [10]. Despite the growing scientific evidence about the relationship between sport pro-environmental initiatives and fans' pro-environmental decisions, there has been no contributions examining the effectiveness of sport emotionally involved context on the real adoption of pro-environmental behaviors by comparing sport fans and other publics, or more specifically comparing emotionally involved sport fans and socially conscious young individuals/consumers.

To this end, the purpose of this study is twofold: first, to empirically examine the relationship between consumers' pro-environmental attitudes and pro-environmental behaviors; and second, to test the moderated effect of the type of publics on this relationship by comparing two groups of individuals: sport fans, that traditionally have a strong emotional involvement with the club that promotes pro-environmental sustainability initiatives; and university students, which are expected to show a more intrinsic and cognitive relationship with pro-environmental sustainability initiatives and the organizations that carry out these actions (for instance, universities and other institutions).

This research adds a richer understanding of the depths of the relationship between pro-environmental attitude and pro-environmental behavior; and the role that a more emotional and a more cognitive link with the pro-environmental cause or the organization that promotes pro-environmental initiatives may exert on the relationship between attitude and behavior. We argue that comparing these two groups (i.e., sport fans and college students) is worthy of study to further the sustainable sport consumer body of knowledge; to examine practitioners' assumptions and statements concerning the reactions of sport fans to pro-environmental sustainability initiatives; and to assess the power of sport to influence sustainability, in and through sport-related events.

The remainder of the article is structured as follows. First, we present the theoretical background and associated hypotheses, followed by a description of the study methods. We then present the main results, and discuss the research findings. Finally, we conclude with by identifying limitations and outlining future research avenues.

## 2. Literature review

### *2.1. The relationship between attitude and behavior*

Attitude is often defined as a "psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" [[25], p.1], which is expected to influence future intentions and actions regarding this entity [26]. Behaviors, in turn, "consist of one or more observable actions performed by the individual" [27, p.899] and corresponds to the key step that behavioral researchers aim to understand and predict. The relationship between these two key elements – the so-called attitude-behavior relationship - has become one of the most studied topics in psychology [27], aiming to examine whether and how attitudes may guide behaviors. According to Ref. [28], the relationship between attitudes and behaviors is, first of all, a matter of consistency, suggesting

that a person who holds a favorable attitude regarding a certain object is expected to perform a favorable behavior. Thus, studying and understanding attitudes revealed to be a key point, for practitioners and policymakers, in predicting and encouraging behaviors, especially socially and environmentally favorable behaviors.

In business, the attitude-behavior relationship is also well established and has received relevant developments across the years, with a significant emphasis on consumer ethics [29,30], sustainable clothing [31], green purchase behaviors [32], and sport [33]. However, further developments suggested that individuals do not always translate their beliefs into actual behavior, commonly referred "attitude-behavior gap" [34–37]. Recent contributions set up this gap and have explored several elements that may bridge this inconsistency in buying products for ethical reasons [38]; in purchasing green apparel [39], and in recycled and upcycled fashion products [37].

The new developments [40] suggested that the incompatibility between attitudes and behaviors may be due to the level of generality at which these variables were assessed and recommended that attitudes toward the behavior itself should be used to measure and predict specific behaviors. In addition, new contributions should empirically examine the attitude-behavior relationship in different marketing contexts (e.g., sports) and test the moderator role of these contexts in this relationship.

### 2.2. Emotional relationship of sport fans and behavior change

The emotional relationship between sport fans and sport teams is significant [41], beneficial [42], and with a massive influence on today's society [43]. The emotional connection between fans and sport clubs is central to sports organizations' long-term success and sustainability based on fans' passion and enthusiasm [44–47]. Previous research has been done exploring the emotional connection between fans and clubs, and the main findings showed a positive and significant role of sports on fans' social identity formation [48], on fans' rituals, emotions and social atmospheres [49], on loyalty [50], on the feeling of community and all community-related benefits [51] and on fans' financial support [52]. These contributions suggest that a stronger emotional connection - of fans - leads to a higher commitment with to the club, which, in turn, provides significant personal and social benefits.

Encouraging favorable consumer behaviors in sport events and in everyday life is a challenging issue for professional sport organizations [10]. In an university sports context, it was investigated the importance of pro-environmental activities and their impact on fan engagement [16]. Although the authors have measured intentions of future behavior and not current behaviors, they found that activities to promote sustainability by sports organizations influence fan's daily behavior, due to the significant relationship between fans and the clubs (i.e., sport brands), extending seminal works on the link between sports and environmental sustainability [53]. However, further developments are needed to improve current understanding on how the emotional connection between fans and sport clubs can stimulate pro-environmental actions [21]; and the specific factors that may influence this relationship.

### 2.3. Environmental sustainability and sport fans

Consumer sustainability attitudes and sustainable behaviors are something that more and more people expect from sports organizations [54]. Sustainability is gradually becoming an essential part of business strategies in various industries [55] because it is increasingly present in today's society and creates value, improving a company's image and performance [56]. At the individual level, predicting future behaviors is not very reliable [33,57], but organizations can help change the sustainable behaviors of stakeholders [16,57], namely through the intensity with which they can promote activities in favor of a more conscious sustainable behavior [58, 59]. Concerning sport sustainability, what is intended is that fans who demand the adoption of environmentally friendly behaviors, as a result of an internalization of the team values [14], have these behaviors daily as well, and not just because of pressure from society [60].

Fans are one of the most critical stakeholders in the complex sport phenomenon [61,62] and getting their attention to the phenomenon of sustainability can allow greater participation and support in the environment's defense [21]. In this way, and taking into account the greater importance of climate problems, more studies investigated the reaction of fans, considering the behavior of sports organizations in defense of the environment and the subsequent fans' response [63]. In the several investigations executed over the years, the authors suggest that a greater sensitivity to the promotion of climate actions may be linked to greater identification of the fan with the team [14,15]. In this vein, organizations that promote this type of action can benefit far beyond the mere social issue (i.e., pride in belonging to the group) or environmental (i.e., improving air quality). The predisposition to be more often present at events, buy merchandise, or purchase more expensive tickets is a reality that is increasingly confirmed in the behavior of fans, with economic benefits for clubs [10].

Understanding the extent to which environmental sustainability initiatives implemented by a sports organization allow to save money and to be a source of revenue was the research objective [13]. The authors concluded that, contrary to the prevailing thought as a predictor of fan behavior, there is a willingness to pay an additional fee (i.e., an environmental sustainability fee) to support the activity in favor of the environment, regardless of income, loyalty, or personal values. In some investigations [16], age and income mediate a greater consumer propensity for a more positive response concerning environmental sustainability programs. This study [13] shows no such differentiation, with particular relevance to the fan's availability to pay a higher ticket value in defense of greater sustainability and promotion of the environment.

Through a qualitative analysis of different stakeholders (i.e., sport fans', non-sport fans, and community members) [11], had three objectives: a) to understand the environmental attitudes, b) the degree of attribution of responsibility, and c) the priority that should be given to environmental initiatives. The results suggest a division between sport and political issues. Note that responses express pro-environmental responsibility, and the data, as in other surveys [16,64], reinforce the fans' position attributing responsibilities to

sports organizations to be more environmentally responsible.

However, due to the stronger emotional link between the fans and sport organizations, more work is necessary to understand the attitude and the expectations of sport fans regarding pro-environmental sustainability initiatives promoted by sport organizations [65]; and the influence that sport organizations initiatives can have on fans pro-environmental decisions and behaviors.

### 2.4. Environmental sustainability and university students

There is also a growing concern about sustainability in other spheres of society, believing that certain individual behaviors may be associated with climate change [66]. Studies examining university students' environmental sustainability choices and behaviors have been increasing, but the main findings are still limited [63,67]. Consumer trends suggest that younger generations demand more sustainable products and preferences towards more environmentally and socially conscious companies and brands [68]. The results of university students in two universities in the recreation administration area were analyzed [69]. This study represents a starting point to improve the foundations of future recreation of managers in terms of environmental sustainability, such as understanding the link between personal perspectives on actions taken with ecological issues. Pelcher (2022), extending prior work [69] aimed to evaluate university students from higher education institutions in North America and their relationship with environmental sustainability. Although students (regardless of whether they are non-graduates or graduates) often support and expect sports organizations to behave more pro-environmentally than other industries, they are not willing to pay more for a ticket to greater sustainability. Regarding behavior, there are differences between undergraduate and graduate students. The authors concluded that factors such as the possibilities of education in the environmental field, exposure on campus to environmental initiatives, the performance of sports activities, or personal experiences (e.g., where they live) help to explain the differences found between undergraduate and graduate students.

There is a need to educate students on the applicability of environmental sustainability, whether for present or future work [70]. A method to teach this applicability was specifically studied [71]. By applying transformative sustainable learning (TSL), the authors aimed to understand the efficiency of TSL courses in the sphere of the sports management program. They concluded that for the student, there was a better understanding and application of the concepts studied. The instructor had a better experience with the class structure, creating content that meets the student's needs through collaboration and reflection throughout the sessions between instructor-student [71].

Previous studies show a growing interest in more excellent knowledge in sustainability, leisure, and sport management and how it can help university students better know and apply the concepts learned with future repercussions in the environment. Behavioral differences were discovered [67] between graduates and non-graduates in sports management, reinforcing that it is necessary to work on the knowledge about the environmental sustainability initiatives the sport organization does. In line with other studies [69], Pelcher makes a distinction between "awareness" and "knowledge" when referring to stakeholders' perceptions of environmental sustainability initiatives carried out by the organizations. For the individuals, this distinction failure makes it very difficult for these initiatives to succeed, that is, to have the possibility to change individual attitude and behavior during the event and, subsequently, in their daily lives.

In the benefit of sustainability, about the possibility of paying a higher price for an entry ticket to a sporting event, depending on the populations studied, there are studies with contradictory results. For [67], students are not willing to pay more for a ticket in favor of sustainability. However, others [13] concluded that for sports fans, there is such a desire. To the best of our knowledge, no studies compare sport fans with college students in environments so emotionally and cognitively different.

Two reasons underlie this work: first, the studies carried out in this area – relating pro-environmental attitude and pro-environmental behavior as a result of sustainability initiatives promoted by real organizations – are few and dispersed [7]. Second, comparing two different environments, with two target audiences exhibiting distinct types of connection with pro-environmental theme, is worthy of analysis to better understand and plan the actions to be developed in order to encourage environmentally

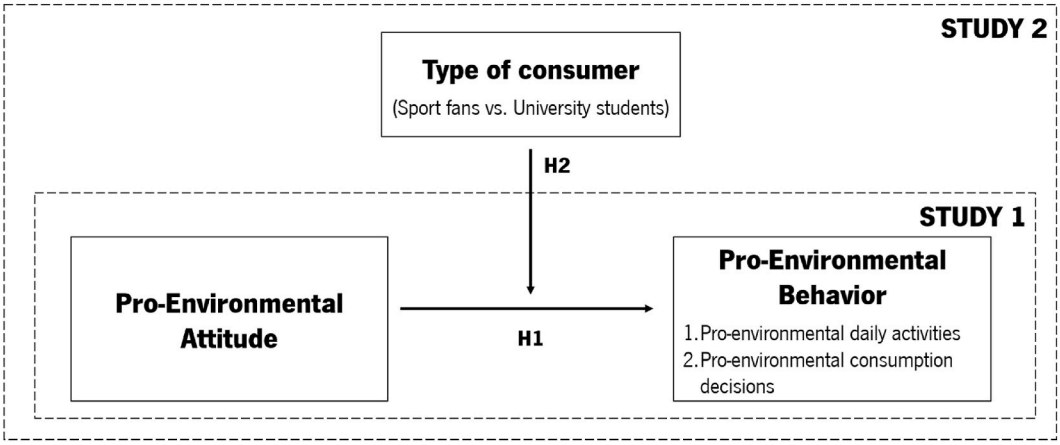


**Fig. 1.** Proposed conceptual model.

favorable decisions and behaviors. Following the rationale that sport fans will exhibit a strong affective and emotional link with the pro-environmental initiatives promoted by the club and/or with the sport club by itself [10], and that university students will show a more intrinsic and cognitive link with pro-environmental topic [72], this research aims to empirically examine the relationship between consumer pro-environmental attitude and pro-environmental behavior; and to test the moderated role of an emotional vs. cognitive relationship with pro-environmental sustainability initiatives carried out, by comparing two types of publics: emotionally involved sport fans and socially conscious university students. Based on that, the following research hypotheses are proposed.

**H1**. Consumer pro-environmental attitude will positively influence favorable pro-environmental behavior.

**H2**. The relationship between consumer pro-environmental attitude and pro-environmental behavior will be moderated by the type of consumer, such that this relationship will be higher for sport fans than university students.

Fig. 1 shows the proposed conceptual model for this research.

## 3. Study 1 – methods and results

The first study aimed to assess the scales' psychometric properties and test the relationship between individuals' pro-environmental attitudes and pro-environmental behavior (Hypothesis 1). Data were collected in partnership with a Portuguese professional sport team (PST) actively committed to environmental issues. Ranked in the top 15 of the best football clubs in the world [73], the PST analyzed has more than 137,000 paying members [74], and over 9 million followers on social media [75]. Regarding sustainability initiatives, the PST stadium was designed to focus on sustainable operations since the construction phase. As a result, it was the first worldwide certified by the quality and environmental management standards ISO 9001 and 14001 [76]. Further, PST's sustainability policy involves effective measures on energy consumption (e.g., all the lighting use LED technology and was reduced to the minimum), water consumption (e.g., large posters encouraging the reduction of water consumption were placed in the bathrooms; and an alert message asking for efficient water use appeared on the computer screen of the club employees), and waste management, through a large number of in-house recycling depots all around the club infrastructures [77].

### 3.1. Participants and research design

Participants – i.e., football fans – were recruited from the club's database, with a random sample of 5000 paying members selected by the club. The number of paying members invited to participate in this research was discussed with the club and 5000 was deemed appropriate in balancing two key aspects: to be an appropriate sample size in terms of research validity [78,79] and to avoid disturbing fans by asking them to participate in several studies carried out by the cub throughout the sport season. An online questionnaire was distributed assessing the constructs under interest (see below). Preventive remedies were carried out to alleviate concerns with common method bias (CMB). The questionnaire was kept short; the language used was simple and clear; a pre-test was applied, and the necessary adjustments were performed [80,81]. The foreword in the questionnaire also reinforced that there were no right or wrong answers; and that the information to be collected was anonymous and confidential to reduce response bias such as social desirability bias or acquiescence [82]. Participation was voluntary, and no incentives were provided. A valid sample of 1027 sport fans was collected (response rate of more than 20 %). Appendix 1 shows the profile of the respondents.

### 3.2. Measures

Pro-environmental attitude was measured with four items adapted from Ref. [83] Environmental Attitudes Inventory, using a 7-point Likert scale (from "1 - Strongly Disagree" to "7 - Strongly Agree"). Pro-environmental behavior was assessed through the scale proposed by Ref. [10], which included three items to measure Environmental Daily Activities and four items to evaluate Environmental Consumption Habits/Decisions, measured on a 7-point Likert scale (from "1 - Strongly Disagree" to "7 - Strongly Agree"). The constructs and items used are depicted in Table 2.

### 3.3. Results

A Confirmatory Factor Analysis (CFA) was employed using AMOS 27 to assess the psychometric properties of the scales. Table 1 provides an overview of the descriptive statistics and correlations between the constructs. All factor loadings exceeded the cut-off criterion of 0.50 (Table 2), indicating adequate individual item reliability [85]. Composite reliability (CR) was above the

**Table 1**
Descriptive statistics and discriminant validity results of the first-order measurement model – Study 1.

| | M | SD | 1 | 2 | 3 |
|---|---|---|---|---|---|
| 1. PRO-ENVIRONMENTAL ATTITUDE | 5.53 | 1.27 | **.746** | | |
| 2. PRO-ENVIRONMENTAL DAILY ACTIVITIES | 5.74 | 1.47 | .436*** | **.884** | |
| 3. PRO-ENVIRONMENTAL CONSUMPTION HABITS/DECISIONS | 4.88 | 1.52 | .509*** | .745*** | **.793** |

Square root of AVE on the diagonal to test Discriminant Validity [84].
***$p < .001$.

**Table 2**
Psychometric properties of the scales used - Study 1.

| Constructs/Items | M | SD | Loading | Z-value | | |
|---|---|---|---|---|---|---|
| **PRO-ENVIRONMENTAL ATTITUDE** | | | | | | |
| Scale adapted from Ref. [83] Environmental Attitudes Inventory. (*CR=.832; AVE=.557; Alpha=.847*) | | | | | | |
| EA1 - Environmental protection is a very important issue for me. | 5.83 | 1.40 | .670 | 20,341 | | |
| EA2 - I would like to actively participate in an environmentalist group. | 5.26 | 1.71 | .848 | 23,695 | | |
| EA3 - I think I would help to raise funds for environmental protection. | 5.41 | 1.56 | .796 | 22,092 | | |
| EA4 - I often try to persuade others that the environment is important. | 5.63 | 1.53 | .652 | 20,165 | | |
| **PRO-ENVIRONMENTAL BEHAVIOR** | | | | | **Second-Order** | |
| Scale proposed by Ref. [10]. (*CR=.901; AVE=.819; Alpha=.927*) | | | | | **Loading** | **Z-value** |
| **Pro-Environmental Daily Activities** (*CR=.914; AVE=.781; Alpha=.925*) | | | | | .818 | 26,594 |
| DA1 - I separate waste and recycling. | 5.89 | 1.63 | .819 | 30,779 | | |
| DA2 - I monitor and reduce the water I use. | 5.67 | 1.56 | .910 | 35,467 | | |
| DA3 - I monitor and reduce the energy I use. | 5.66 | 1.53 | .919 | 36,154 | | |
| **Pro-Environmental Consumption Habits/Decisions** (*CR=.871; AVE=.629; Alpha=.889*) | | | | | .984 | 26,842 |
| CD1 - I buy biodegradable products. | 5.08 | 1.63 | .897 | 35,552 | | |
| CD2 - I changed my eating habits, for instance, I eat more vegetables and less meat. | 4.75 | 1.83 | .744 | 26,901 | | |
| CD3 - When choosing my vacations, I take into account environmental concerns. | 4.73 | 1.78 | .766 | 27,853 | | |
| CD4 - When choosing an event, I take into account environmental concerns. | 4.98 | 1.74 | .756 | 27,470 | | |

**Fit of Measurement Model:** $\chi^2(36) = 116{,}441$ ($p < .001$); $\chi^2/df = 3234$; CFI = 0.991; TLI = 0.986; NFI = 0.987; RMSEA = 0.047 (CI = 0.037-0.056); SRMR = 0.0273.
Notes: CR=Composite reliability; AVE = Average Variance Extracted.

recommended threshold of 0.70 for all constructs, and average variance extracted (AVE) also exceeded the minimum recommended criterion of 0.50, suggesting satisfactory internal consistency and convergent validity of the constructs [86,87]. In addition, the square root of AVE was greater than any inter-construct correlations, providing evidence of discriminant validity [84].

The results of the first-order measurement model showed an adequate fit to the data: $\chi2(36) = 116{,}441$, $p < .001$; $\chi2/df = 3234$; Comparative Fit Index (CFI) = 0.991; Tucker-Lewis Index (TLI) = 0.986; Normed Fit Index (NFI) = 0.987; Root Mean Square Error of Approximation (RMSEA) = 0.047; Standardized Root Mean Square Residual (SRMR) = 0.0273 (Table 2). The goodness-of-fit indices were above the recommended thresholds of 0.95 (Hu & Bentler, 1998; Hu & Bentler, 1999), and RMSEA and SRMR were below the cut-off criteria of 0.07 [85,88]. These results indicate that the model was deemed appropriate for further analysis.

Structural Equation Modeling was then used to test the research hypothesis of Study 1. Gender and age were included as control variables due to their potential influence on fan behaviors [89] and the relatively unbalanced distribution of the sample regarding gender (Appendix 1). The results showed that participants' pro-environmental attitude had a positive and significant effect on pro-environmental behavior ($\beta = 0.593$, $p < .001$), supporting H1 (Table 3 and Fig. 2). In addition, the relationship between pro-environmental attitude and behavior is relatively stable across Model 1 ($\beta = 0.593$, $p < .001$; without control variables) and Model 2 ($\beta = 0.580$, $p < .001$; with control variables), suggesting that the control variables have a very small influence on respondents' pro-environmental behavior. These data indicate that increasing fans' pro-environmental attitude will lead to more environmentally favorable daily activities and consumption decisions. Furthermore, individuals' pro-environmental attitude accounts for 35,2 % of the variance in pro-environmental behaviors (Fig. 2).

## 4. Study 2: methods and results

Study 2 aimed at gaining greater knowledge of the relationship between individuals' pro-environmental attitude and pro-environmental behavior by testing the moderating role of the condition of individuals, comparing two different types of young

**Table 3**
Hypothesis testing and controlling variables – Study 1.

| Paths | | Model 1 | | | | Model 2 | | | | Hypothesis Testing |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SRE | SE | t-value | $R^2$ | SRE | SE | t-value | $R^2$ | |
| H1 | Pro-Environmental Attitude → Pro-Environmental Behavior | .593 | .040 | 12,769*** | 35,2 | .580 | .039 | 12,724*** | 39,4 | Supported |
| | Gender → Pro-Environmental Behavior | | | | | .050 | .089 | 1825 | | |
| | Age → Pro-Environmental Behavior | | | | | .235 | .002 | 8285*** | | |

Fit Model 1: $\chi^2(36) = 116{,}441$ ($p < .001$); $\chi^2/df = 3234$; CFI = 0.991; TLI = 0.986; NFI = 0.987; RMSEA = 0.047 (CI = 0.037-0.056); SRMR = 0.0273.
Fit Model 2: $\chi^2(57) = 254{,}492$ ($p < .001$); $\chi^2/df = 4465$; CFI = 0.978; TLI = 0.965; NFI = 0.972; RMSEA = 0.058 (CI = 0.051-0.065).
***$p < .001$.

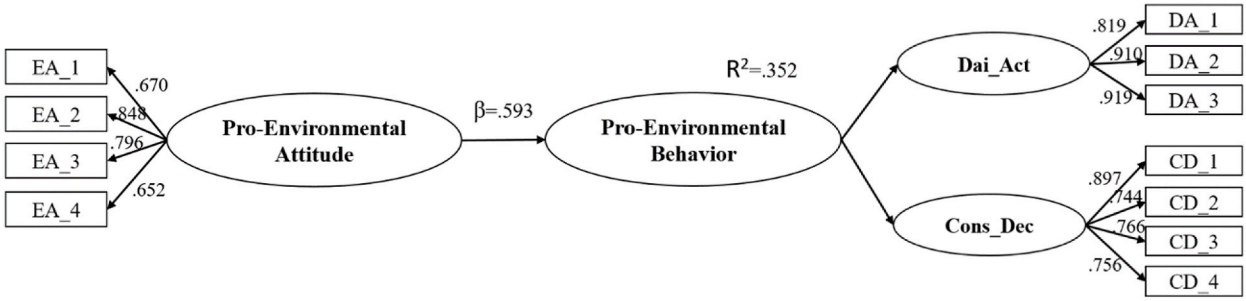


**Fig. 2.** Summary of the structural model.

individuals: emotionally involved sport fans and socially conscientious students.

### 4.1. Participants and research design

In Study 2, two new samples were collected. Sport fans invited to participate were recruited from the database of the same sport club of Study 1 and included a random sample of 1000 paying members selected by the club and not previously selected for Study 1; thus expected individuals with a significant emotional link with the club that is promoting pro-environmental sustainability initiatives [10]. The university environment is more favorable for creating a context for learning and discussing environmental issues [7]. University students were recruited from the database of one of the most representative university student association in the country. This university student association represents more than 70,000 students from 27 higher education institutions [90]. An online invitation to participate in this research by filing-out a questionnaire was sent to a random sample of 1000 students registered in the association's database, and the recommended preventive remedies to alleviate CMB were applied regarding questionnaire length, clear wording, ease of answer, and motivating design [80,81]. The foreword of the questionnaire again reinforced that there were no right or wrong answers; and that the information to be collected is anonymous and confidential [82]. To avoid potentially unbalanced samples regarding age between sport fans and university students, a mandatory preliminary question was introduced in the sport fans' questionnaire, ensuring that only individuals between 18 and 30 participated in the study. Further, a preliminary question for both sport fans and university students ensured that individuals participating in this Study 2 had not participated in Study 1, preventing potential sample overlap. In addition, two questions were included in the introduction of the questionnaire with university students, examining if they are fans of a sport club; and if they are paying members of this sport club. Despite 75,4 % (n = 135) of university students indicated that they are fans of a sport club, only 18,4 % (n = 33) are paying member of this club, also significantly preventing potential sample overlapping. Participation was voluntary, and no incentives were provided. A valid sample of 432 individuals was collected: 253 sport fans and 179 university students. Appendix 2 shows the profile of both samples.

### 4.2. Measures

Environmental attitude for both sport fans and university students was measured through four items adapted from Ref. [83] Environmental Attitudes Inventory, using a 7-point Likert scale (from "1 - Strongly Disagree" to "7 - Strongly Agree"). Pro-environmental behavior was assessed through the scale proposed [10] for both samples, which included three items to measure Environmental Daily Activities and four items to evaluate Environmental Consumption Habits/Decisions measured on a 7-point Likert scale (from "1 - Strongly Disagree" to "7 - Strongly Agree") (Table 5). Further, to assess that we are comparing emotional and cognitive environments, a six-item scale measuring brand love was used. The scale was adapted from [191] and included items such as "I feel emotionally connected to (…)" and "I will use products of (…) for a long time". Higher values of brand love indicate a higher emotional connection with the brand/organization that is promoting pro-environmental initiatives – sport club for fans and university for

**Table 4**
Comparison of brand love among football fans and university students.

| Items | M football fans (SD) | M univ. students (SD) | T-Test |
|---|---|---|---|
| BLove1 - I see my identity and my values reflected in ("FC Porto" for football fans and "my University" for students). | 6.27 (1.03) | 4.17 (1.77) | 15.487*** |
| BLove2 - I like to use products of (…). | 6.20 (1.22) | 4.27 (1.76) | 13.396*** |
| BLove3 - I feel emotionally connected to (…). | 6,68 (0.79) | 3.77 (1.93) | 21.611*** |
| BLove4 - I will use products of (…) for a long time. | 6.33 (1.18) | 3.91 (1.83) | 16.691*** |
| BLove5 - Without (…), I would feel anxiety. | 5,47 (1.89) | 3.69 (1.91) | 9.652*** |
| BLove6 - I evaluate products/services of (…) in a very positive way. | 6.11 (1.11) | 4.24 (1.66) | 14.004*** |
| (Adapted from Ref. [92]. 7-point scale ***p > .01 | | | |

university students; while lower levels of brand love indicated a more cognitive, rational and utilitarian relationship with the brand/institution [91].

### 4.3. Results

Initially, the brand love between the two samples was analyzed to ensure that we are comparing groups of individuals with different levels of emotional connection. The results showed that, in all items of brand love, football fans have a significantly higher emotional connection with the club than the connection between university students and its institution (Table 4). Further, a score of brand love was calculated (Cronbach's Alpha $\alpha = .947$) and the data indicated that football fans ($M_{BLfans} = 6.18$; $SD = 0.97$) and university students ($M_{BLstud} = 4.01$; $SD = 1.59$) are statistically different concerning emotional connection with the organization that is promoting pro-environmental initiatives ($t = 17.586$; $p < .01$) (Fig. 3). This suggests that football fans exhibit an emotional connection with the organization that is promoting pro-environmental initiatives. Also, university students have a cognitive and utilitarian connection with the institution; thus, these groups were deemed appropriate to fulfill the second goal of this research.

Afterwards, a Confirmatory Factor Analysis (CFA) was performed using AMOS 27 to assess the psychometric properties of the scales. Table 5 shows the descriptive statistics and correlations between the constructs. The values of all factor loading higher than 0.50 indicated adequate individual item reliability (Table 6) [85]; and composite reliability (CR) greater than 0.70, and average variance extracted (AVE) above 0.50 demonstrated satisfactory internal consistency and convergent validity of the constructs [86,87]. The square root of AVE, greater than any inter-construct correlations, supports discriminant validity [84].

The results of the measurement model showed a good fit to the data: $\chi2(38) = 46{,}379$, $p = .165$; $\chi2/df = 1221$; $CFI = 0.996$; $TLI = 0.995$; $NFI = 0.981$; $RMSEA = 0.023$; $SRMR = 0.0345$ (Table 6) [87,88,93]. These results indicate that the model was appropriate for further multivariate data analysis. Structural Equation Modeling was then used to test the relationship between pro-environmental attitude and pro-environmental behavior. Gender and age were again tested as control variables due to their relevance in previous research [10] and the results obtained in Study 1. The results reinforced Study 1 and showed that young participants' pro-environmental attitude had a positive and significant effect on pro-environmental behavior ($\beta = 0.631$, $p < .001$), supporting H1 (Table 7). Gender and age (limited to 18–30 in sport fans) did not influence the relationship between the main constructs under study. Thus, increasing young fans' pro-environmental attitude will lead to more environmentally friendly behaviors, suggesting that pro-environmental attitude predicts behavior.

A multigroup SEM analysis using the Analysis of Moment Structures (AMOS) was performed to test the moderating role of the type of consumer on the structural relationship between attitude and behavior [85]. We examined the moderation effect of consumer condition by applying chi-square ($\chi^2$) difference test of the unconstrained model and the structural weights model [94,95]. The findings of the multigroup structural model showed that individuals' pro-environmental attitude positively influences pro-environmental behavior in both groups, the sport fans ($\beta = .543$; $p < .001$) and the university students ($\beta = 0.738$; $p < .001$) (Table 8). However, this relationship is significantly higher in the group of university students than in the sport fans group ($\chi^2_{diff.} = 214, 998$; $p < .001$) (Table 9). These results partially support H2, confirming that type of the individual plays an important role in strengthening the relationship between pro-environmental attitude and pro-environmental behavior. We proposed in H2 that the relationship between pro-environmental attitude and pro-environmental behavior would be greater for sport fans than for university students. However, the results indicated that, despite the higher mean values of pro-environmental attitude and pro-environmental behavior – daily activities and consumption decisions – for football fans, the influence of pro-environmental attitude on behavior is higher in university students (Table 10).

## 5. Discussion

This research provides insights into the growing body of literature on pro-environmental decision-making and sport consumer behavior research. As more organizations – public and private, and from different sectors – consider and implement pro-environmental sustainability initiatives, more research is needed to understand the real impact of such initiatives and their ensuing effect on individuals' attitudes and practical behaviors [10]. This study explores the necessity of such background, aiming at improving the current understanding of the relationship between pro-environmental attitude and pro-environmental behavior and the moderator role that the type of consumer may exert in this relationship. This new evidence supports this connection's trajectory and movement, stressing the importance of understanding and improving consumer pro-environmental attitudes, which, in turn, will positively encourage pro-environmental behaviors.

This study shows that individuals' pro-environmental attitude positively influences pro-environmental behavior. Although in

**Table 5**
Descriptive statistics and discriminant validity results of the first-order measurement model – Study 2.

| | M | SD | 1 | 2 | 3 |
|---|---|---|---|---|---|
| 1. PRO-ENVIRONMENTAL ATTITUDE | 5.55 | 1.23 | **.781** | | |
| 2. PRO-ENVIRONMENTAL DAILY ACTIVITIES | 5.38 | 1.39 | .461*** | **.801** | |
| 3. PRO-ENVIRONMENTAL CONSUMPTION HABITS/DECISIONS | 4.19 | 1.47 | .517*** | .607*** | **.737** |

Square root of AVE on the diagonal to test Discriminant Validity [84].
***$p < .001$.

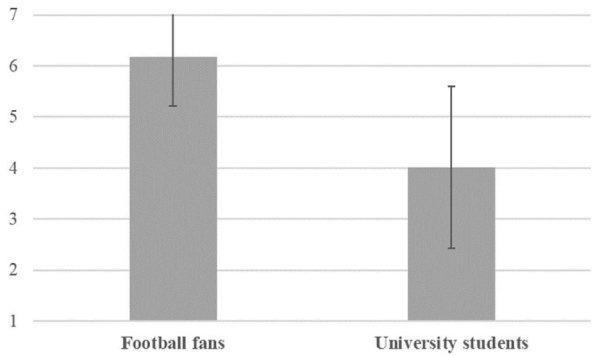


**Fig. 3.** Comparison of Brand Love between football fans and university students.

**Table 6**
Psychometric properties of the scales used - Study 2.

| Constructs/Items | M | SD | Loading | Z-value | | |
|---|---|---|---|---|---|---|
| PRO-ENVIRONMENTAL ATTITUDE | | | | | | |
| Scale adapted [83]. (*CR=.860; AVE=.610; Alpha=.843*) | | | | | | |
| EA1 - Environmental protection is a very important issue for me. | 5.68 | 1.46 | .597 | 13,105 | | |
| EA2 - I would like to actively participate in an environmentalist group. | 5.36 | 1.58 | .839 | 20,213 | | |
| EA3 - I think I would help to raise funds for environmental protection. | 5.43 | 1.55 | .808 | 18,400 | | |
| EA4 - I often try to persuade others that the environment is important. | 5.75 | 1.45 | .851 | 19,815 | | |
| **PRO-ENVIRONMENTAL BEHAVIOR** | | | | | **Second-Order** | |
| Scale proposed [10]. (*CR=.876; AVE=.780; Alpha=.860*) | | | | | **Loading** | **Z-value** |
| **Pro-Environmental Daily Activities** (*CR=.838; AVE=.640; Alpha=.799*) | | | | | .814 | 10,638 |
| DA1 - I separate waste and recycling. | 5.46 | 1.83 | .606 | 12,517 | | |
| DA2 - I monitor and reduce the water I use. | 5.36 | 1.56 | .881 | 21,373 | | |
| DA3 - I monitor and reduce the energy I use. | 5.31 | 1.51 | .881 | 21,206 | | |
| **Pro-Environmental Consumption Habits/Decisions** (*CR=.824; AVE=.543; Alpha=.819*) | | | | | .948 | 15,740 |
| CD1 - I buy biodegradable products. | 4.36 | 1.64 | .758 | 17,062 | | |
| CD2 - I changed my eating habits, for instance, I eat more vegetables and less meat. | 4.41 | 1.88 | .606 | 12,914 | | |
| CD3 - When choosing my vacations, I take into account environmental concerns. | 3.83 | 1.90 | .805 | 18,613 | | |
| CD4 - When choosing an event, I take into account environmental concerns. | 4.18 | 1.86 | .762 | 17,234 | | |

**Fit of Measurement Model:** $\chi^2(38) = 46{,}379$ ($p = .165$); $\chi^2/df = 1221$; CFI = 0.996; TLI = 0.995; NFI = 0.981; RMSEA = 0.023 (CI = 0.000-0.043); SRMR = 0.0345.
Notes: CR=Composite reliability; AVE = Average Variance Extracted.

**Table 7**
Hypothesis testing and controlling variables – Study 2.

| Paths | | Model 1 | | | | | Model 2 | | | | Hypothesis Testing |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SRE | SE | t-value | $R^2$ | | SRE | SE | t-value | $R^2$ | |
| H1 | Pro-Environmental Attitude → Pro-Environmental Behavior | .631 | .057 | 8204*** | 39,8 | | .628 | .057 | 8199*** | 39,8 | Supported |
| | Gender → Pro-Environmental Behavior | | | | | | .023 | .088 | ,473 | | |
| | Age → Pro-Environmental Behavior | | | | | | .050 | .010 | 1033 | | |

**Fit Model 1**: $\chi^2(38) = 46{,}379$ ($p = .165$); $\chi^2/df = 1221$; CFI = 0.996; TLI = 0.995; NFI = 0.981; RMSEA = 0.023 (CI = 0.000-0.043); SRMR = 0.0434.
**Fit Model 2**: $\chi^2(59) = 135{,}226$ ($p < .001$); $\chi^2/df = 2292$; CFI = 0.968; TLI = 0.951; NFI = 0.945; RMSEA = 0.055 (CI = 0.043-0.067).
***$p < .001$.

**Table 8**
Structural model comparing sport fans and university students (Study 2).

| | Sport fans | Univ. students | Hypothesis | Chi-Square Difference | Hypothesis testing |
|---|---|---|---|---|---|
| Environmental Attitude → Environmental Behavior | .543*** | .738*** | H2 | 214,998*** | Partially Supported |

Model fit: $\chi^2(78) = 137{,}296$ ($p < .001$); $\chi^2/df = 1760$; CFI = 0.975; TLI = 0.965; NFI = 0.945; RMSEA = 0.042 (CI = 0.030-0.053); SRMR = 0.0341.
***$p < .001$.

**Table 9**
Multigroup difference analysis between sport fans and university students.

| Model | DF | CMIN | *P* | NFI Delta-1 | IFI Delta-2 | RFI rho-1 | TLI rho2 |
|---|---|---|---|---|---|---|---|
| Structural weights | 21 | 214,998 | ,000 | ,087 | ,089 | ,080 | ,083 |

**Table 10**
Descriptive statistics for both samples (Study 2).

| | SPORT FANS (n = 253) M (SD) | UNIV. STUDENTS (n = 179) M (SD) |
|---|---|---|
| PRO-ENVIRONMENTAL ATTITUDE | 5,91 (1,07) | 5,05 (1,28) |
| EA1 | 5,70 (1,51) | 5,65 (1,38) |
| EA2 | 5,86 (1,39) | 4,65 (1,57) |
| EA3 | 5,96 (1,21) | 4,68 (1,68) |
| EA4 | 6,05 (1,27) | 5,34 (1,59) |
| **PRO-ENVIRONMENTAL BEHAVIOR** | **4,98 (1,31)** | **4,30 (1,15)** |
| **Environmental Daily Activities** | **5,56 (1,37)** | **5,12 (1,37)** |
| DA1 | 5,65 (1,32) | 5,18 (1,95) |
| DA2 | 5,54 (1,51) | 5,09 (1,59) |
| DA3 | 5,48 (1,49) | 5,08 (1,51) |
| **Environmental Consumption Habits/Decisions** | **4,55 (1,49)** | **3,69 (1,29)** |
| CD1 | 4,72 (1,73) | 3,85 (1,36) |
| CD2 | 4,45 (1,85) | 4,35 (1,92) |
| CD3 | 4,26 (1,93) | 3,21 (1,70) |
| CD4 | 4,77 (1,70) | 3,34 (1,76) |

previous research, attitudes toward sustainable actions did not significantly predict sustainable behavioral intentions [53], this research, through two different studies and involving more than 1.400 individuals, supports more recent contributions which assume that pro-environmental attitude has a positive and significant influence on pro-environmental behaviors [63,64]. So, improving and reinforcing individuals' intrinsic pro-environmental attitude must be a goal of organizations that aim to encourage and stimulate effective environmentally friendly behaviors.

Emotionally involved sport fans reported higher levels of pro-environmental attitude and pro-environmental behavior. This demonstrates that PST's efforts to raise stakeholders' awareness in favor of a more sustainable behavior yield positive results. There is greater awareness and knowledge of the initiatives carried out by sports organizations, thus showing that organizations can have a real impact on changing stakeholders' sustainable behaviors [16,57]. Due to the global attraction and identification between fans and their sport organizations [96], sport organizations may have a significant and effective role in promoting pro-environmental habits and contributing to a better world.

On the other hand, socially conscious university students revealed a stronger relationship between pro-environmental attitude and pro-environmental behavior. Despite the relatively lower levels of pro-environmental attitude and pro-environmental behavior compared to sport fans, a more intrinsic and cognitive link with the pro-environmental topic and the organizations that can carry out these actions seem to strengthen the connection between attitude and behavior in this public. This can be explained by the more depth, and intrinsic judgments on pro-environmental sustainability acquired consistently by younger generations [72]. Sport fans, in turn, may be more emotionally influenced by the club's statements and actions [97], but this higher affective link, despite the single improvement in attitude and behavior, doesn't seem to have the same robustness to an effective relationship between attitude and behavior.

## 6. Research implications

This research provides empirical evidence of the relationship between pro-environmental attitudes and pro-environmental behavior; and the role that a more cognitive/intrinsic (university students) or a more emotional (sport fans) relationship with pro-environmental theme may play in strengthening effective environmentally favorable behaviors. This study is the first to demonstrate that sport fans are more likely than university students to be influenced by the organization's pro-environmental sustainability initiatives and to assimilate and report these environmental values. For sports organizations, this research reinforces the role of pro-environmental policies and sustainability initiatives as key elements to encourage change. These initiatives may include: energy savings; production and use of renewable energy (e.g., solar and wind); saving and reusing water; recycling and waste treatment; partnerships with public transport companies to reduce fans' carbon footprint when traveling to the stadium; or even partnerships with pro-environmental organizations that share similar sustainable values.

Sport also offers a unique relationship with the natural environment [98], which further supports the fit that sport can promote environmental sustainability more than in other contexts (i.e., in the workplace or everyday life). Previous researchers have suggested that the collective social identity of sport fans can be leveraged to engage sport fans who may not otherwise be receptive to pro-environmental messages in other contexts [20]. Our findings confirm previous studies that showed sport is a great promoter of

pro-environmental behaviors [14]. Yet this study compares context to a generalized population, further encouraging sport teams' position to promote environmental sustainability. Ultimately, this research demonstrates the value that sport has over general contexts.

## 7. Limitations and avenues for future research

There are constraints in the present study that should be recognized and explored in future studies. First, data were collected through self-reported anonymous questionnaires. Despite the procedures adopted to minimize its potential influence on research findings, future research should use and combine different data collection methods less vulnerable to individuals' self-reporting bias [99], such as controlled lab experiments [100], naturalistic field experiments [101], and longitudinal field observation studies [102]. Second, this research explored specific populations for the necessity of direct comparison. Future research should explore more general populations of sport and non-sport fans, using experimental research designs [103] and employing multiplicative statistical techniques [104]. Third, the age of the participants in comparison makes up one highest spending age groups; the sport sector consists of fans across all age groups, broader demographic groups, and psychographics including political values [20,21]. Future studies should explore comparisons among a broader population representative of the sort and non-sport fans. Furthermore, national samples and longitudinal data collections would expand understanding of regional-specific environmental attitudes and behaviors and trends of these aspects over time. In addition, this research provides a contribution to help understand the role brand love can play in encouraging pro-environmental behaviors. Future research should explore the role of brand love in encouraging pro-environmental behaviors, by testing its moderation, mediation and moderated mediation effects. Finally, this research demonstrates the value of the sport sector as a promoter of pro-environmental behaviors [14,105]. However, more research is needed to understand how pro-environmental behaviors can be promoted through sport and what makes sport unique compared to other contexts. To this end, researchers should explore the role of fans' personal values, level of identification and social identities in encouraging stronger environmental attitudes and behaviors, examining its moderated effect and comparing different contexts. Similarly, the influence of sport's direct relationship to nature on these consuer perceptions in artificial (indoor sports) vs. natural environments (outdoor sports) should be examined.

## 8. Concluding remarks

This investigation aimed to evaluate the relationship between pro-environmental attitude and pro-environmental behavior, testing the moderating role of different publics with different contexts in this relationship. Through two studies, the results show that pro-environmental attitude positively influences behavior. Measures that encourage a favorable attitude towards the environment are desirable because they encourage environmentally friendly behaviors. It was also tested the moderator role of the type of individuals - sport fans and university students – on this relationship. The results suggest that individuals with a greater emotional connection with the organizations that promote pro-environmental initiatives have higher average levels of pro-environmental attitude and pro-environmental behavior, meaning that this public assimilates, in an effective way, the messages and actions conveyed by organizations – and clubs - that promote pro-environmental sustainability initiatives. So, pro-environmental initiatives promoted by sport organizations are desired and should be encouraged, since they seem to really influence fans' environmentally favorable behaviors. On the other hand, the magnitude of the influence between pro-environmental attitude and pro-environmental behavior is more significant in the group of individuals characterized by having a greater cognitive and intrinsic connection with the environmental cause - i.e., university students.

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## Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions.

## CRediT authorship contribution statement

**Ricardo Cayolla:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Marco Escadas:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Brian P. McCullough:** Writing – review & editing, Writing – original draft, Validation, Supervision, Investigation, Formal analysis, Data curation, Conceptualization, Dr. **Rui Biscaia:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization, Ricardo. **Ana Cabilhas:** Resources, Dr. **Teresa Santos:** Resources.

## Declaration of competing interest

This work was supported by the UIDB/05105/2020 Program Contract, funded by national funds through the FCT I.P.

## Appendix 1

Sample profile of Study 1.

| Variable | Study 1 (n = 1027) |
|---|---|
| *Gender* | |
| Female (%) | 16.2 |
| Male (%) | 83.8 |
| *Age* | |
| 18-24 (%) | 5.2 |
| 25-34 (%) | 16.0 |
| 35-44 (%) | 22.4 |
| 45-54 (%) | 23.4 |
| 55-64 (%) | 14.1 |
| 65 and over (%) | 18.9 |
| *Education* | |
| Less than high school (%) | 41.7 |
| High school graduate (%) | 32.2 |
| Postgraduate level (%) | 23.0 |
| I prefer not to answer (%) | 3.1 |
| *Occupation* | |
| Student (%) | 3.5 |
| Employee (%) | 58.3 |
| Independent worker/Self-employed (%) | 14.4 |
| Unemployed (%) | 3.8 |
| Retired (%) | 17.4 |
| I prefer not to answer (%) | 2.6 |
| *Monthly net income* | |
| No income (%) | 6.0 |
| Up to 999€ (%) | 18.1 |
| €1000 - €1.999 (%) | 27.5 |
| €2000 - €2.999 (%) | 11.0 |
| €3000 - €4.499 (%) | 5.5 |
| €4.500+(%) | 8.4 |
| I prefer not to answer (%) | 23.5 |

## Appendix 2

Samples profile of Study 2.

| Variable | Sport Fans (n = 253) | University Students (n = 179) | Total |
|---|---|---|---|
| *Gender* | | | |
| Female (%) | 33.6 | 78.3 | 51.9 |
| Male (%) | 66.4 | 21.7 | 48.1 |
| *Age* | | | |
| Mean | 25.4 | 22.1 | 24.0 |
| SD | 3.3 | 4.9 | 4.3 |

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