

The effectiveness of a college athletic department's pro-environmental initiatives: Examining the tri-component attitude model

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ABSTRACT

The current study seeks to determine whether sport consumers' beliefs, feelings, and behavioural intentions differ when the consumers perceive and are presented with a college athletic department's high pro-environmental performance compared to its ordinary PE performance. This study employed an online-based experiment and relied on data from 613 sport consumers in the U.S. Two PE performance scenarios were developed, and one of the scenarios was randomly assigned to a sample of the consumers. A multivariate analysis of covariance was performed to test the research hypotheses. The findings suggested that sport consumers who were exposed to a college athletic department's high PE performance had significantly higher levels of feelings of gratitude and intentions to donate toward the PE initiatives than those who were presented with the ordinary PE performance. In contrast, there were no significantly differential impacts between high PE performance and ordinary PE performance on sport consumers' beliefs and general feelings. Both high-quality and quantity PE initiatives can function as strong motivational and learning processes that formulate sport consumers' perceptual and emotional engagement. This study contributes to the sport management literature by investigating the differential impacts of PE performance on the tri-component attitude model to fill the research gap.

Keywords: Sport management, Pro-environmental performance, Beliefs, Attitude, Gratitude, Donation intentions.

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INTRODUCTION

As a result of urgent environmental challenges, environmental sustainability has become a high priority for institutions of higher education in North America. In many instances, colleges and universities expand the environmental sustainability commitment and strategic plans for the causes of climate change (Casper et al., 2020). To fulfil this institutional priority, college athletic departments, regardless of size across the United States act as a social platform to promote environmental citizenship and adopt various pro-environmental (PE) initiatives (Kim et al., 2023; Pelcher & McCullough, 2019). A PE initiative involves environmentally responsible actions to minimize or offset the adverse environmental impacts caused by conventional business practices. College athletics departments' PE initiatives encourage a broad spectrum of stakeholder groups (e.g., fans, employees, public administrations, and business partners) to change their environmental attitudes and behaviours. Furthermore, their PE performance in conjunction with communication efforts and messaging strategies enhance emotional engagement and personal obligation to conduct environmentally responsible behaviours (McCullough et al., 2020). In short, anticipating higher expectations from society on environmental responsibilities, college athletic departments have accelerated support of the environmental sustainability efforts led by their Universities and Colleges.

College athletics departments' PE initiatives serve as an effective communication platform to educate their stakeholders about the threat of global climate change. Previous research has demonstrated the essence of PE initiatives which inculcates pro-environmental mindsets and actions to shape a sustainable society (Casper et al., 2014). Casper and his colleagues (2020) found that season ticket holders of a collegiate basketball program reporting higher norms associated with environmentally responsible behaviours at the sporting events have the positive perceptions of the sport organizations' PE efforts. Notably, the PE initiatives at the sporting events and through communication platforms have been an effective means for enhancing positive consumer attitudes, thereby fostering fans and other stakeholders to engage in environmentally responsible behaviours (Cayolla et al., 2023; Jin et al., 2011; McCullough & Cunningham, 2011; Trail & McCullough, 2020). In general, the PE efforts up to this point have indicated a positive association with consumer perceptions and behavioural responses.

A plethora of research has been devoted to understanding the causal relationships between consumers' perceptions of PE initiatives and environmentally responsible behaviours. However, the effectiveness of PE initiatives in the context of collegiate sport is missing in the literature (Casper et al., 2020). There is still a need for empirical research in assessing the impact of different levels of PE performance (high vs. ordinary) by the college athletics departments on consumers' attitudes. In conjunction with the research problem, this study attempts to offer empirical evidence to answer the following research questions: How likely the different levels of PE performance are to have differential impacts on consumers' attitudes? Further, how consumers' attitudes differ when they are exposed to a college athletic department's high PE performance information compared to its ordinary PE performance information?

To fill the aforementioned research gap, the purpose of this study is to examine the impacts of a college athletic department's PE performance on the tri-component model of attitude consisting of cognition (beliefs), affect (feelings), and conation (behavioural intentions). In particular, this current study seeks to determine whether sport consumers' beliefs, feelings, and behavioural intentions differ when the consumers perceive and are presented with a college athletic department's high PE performance compared to its ordinary PE performance. Measuring sport consumers' psychological responses influenced by college athletic departments' PE performance enhance our understanding of the effectiveness of PE initiatives as well as the essential function and role of college athletic departments regarding environmental sustainability for the

institutional commitment and responsibility (Cayolla et al., 2023). Thus, this research will contribute to the environmental sustainability literature in the context of collegiate sport by providing the first empirical evidence of the differential impacts of PE performance on sport consumer attitudes. It is intended to determine whether a college athletic department's high PE performance leads to greater degrees of sport consumers' attitudes than its ordinary PE performance. Those three components of attitude play a crucial role in predicting consumers' overall evaluation of the PE performance as well as determining the return on investment of the PE performance in the form of sport consumers' comprehensive psychological responses.

Literature review

The objective of PE initiatives

Sport organizations at the collegiate and professional levels across North America have adopted various PE initiatives to tackle the ever-increasing environmental threats (Trail & McCullough, 2020). More specific objective of sport organizations' PE initiatives is largely threefold: (a) to minimize or offset carbon emissions; (b) raise awareness of environmental challenges; and (c) inspire and educate various stakeholders to engage in sustainable practices. The implementation of PE initiatives becomes standard and a part of the modern sport landscape (McCullough & Cunningham, 2011). According to Trendafilova and colleagues (2013), the motives of sport organizations' PE initiatives involve fulfilling societal norms on environmental stewardship, increasing expectations from external stakeholders (e.g., governmental agencies and the media) on environmental standards and policies, and growing market pressures to emulate what other competitors are doing to maintain reputation. Additionally, enhancing goodwill perceptions and institutional strategic plan stimulate sport organizations to invest in PE initiatives.

Guided by an institutional strategic plan, college athletic departments have implemented a variety of PE initiatives to offset their carbon footprints. In recent years, despite the financial challenges of building or renovating eco-friendly sports venues, athletic departments at numerous universities regardless of size adopt the Leadership in Energy and Environmental Design (LEED) building standards (Jin et al., 2011; Kim et al., 2023). The LEED certification program developed by the U.S. Green Building Council (USGBC) provides a framework for low-carbon emitting, high-waste diversion rate, healthy indoor air quality, and energy- and water-efficient green buildings (USGBC, n.d.). Building to LEED standards can help a college athletic department benefit from lower operational costs and market pressures, image enhancement, and business partnership opportunities. The LEED-certified athletic facilities reflect college athletic departments' greening efforts and continue to gain ground in the U.S. (Broughton, 2022).

Sport organizations function as a public communication platform not only to promote their commitments to environmental sustainability but also to induce a pro-environmental mindset among stakeholders through environmental messages, reports, and communications (McCullough et al., 2020). In partnerships with environmentally focused companies, professional sport teams in the United States harness naming rights as a message to raise awareness of the urgent need for collective climate action. In June 2020, Amazon decided to purchase naming rights from the Oak View Group and name Climate Pledge Arena for the home of the WNBA's Seattle Storm and NHL's Seattle Kraken. The Climate Pledge is a coalition of companies, organizations, and individuals to address the climate crisis and "*a commitment to reach net-zero carbon emissions by 2040*" (The Climate Pledge, n.d.). Following this environmentally focused naming right agreement, the Kroenke Sports and Entertainment (KSE) partnered with Ball Corporation to produce sustainable aluminium cans, cups, and bottles to educate and showcase in-venue green practices at sporting events including naming rights for Ball Arena (formerly known as Pepsi Center). Most recently, the NBA's Phoenix Suns venue is called Footprint Center. Footprint develops and manufactures food containers and packaging solutions made from plant-based fibres (Young, 2021). Their unique partnership helps introduce

fans to biodegradable, compostable, and recyclable food bowls, plates, and utensils as the most sustainable and healthy choice while providing a more environmentally friendly fan experience at the venue. When fans are informed and exposed to the PE initiatives at sporting events, they are willing to engage in those environmentally responsible practices in their everyday lives (Casper et al., 2020). McCullough and his colleagues (2020) support the notion that “*predominantly, communications from sport organizations serve as a fan engagement effort to increase fan awareness and participation in the initiative*” (p. 4).

Tri-component model of attitude

According to Eagly and Chaiken (1998), “*an attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour*” (p. 269). Kotler and Armstrong (2021) define attitude as “*a person’s relatively consistent evaluations, feelings, and tendencies toward an object or idea*” (p. 145). A consumer’s evaluative responses drive the formation of positive and/or negative views of an object or activity through perceptual, motivational, and learning processes (Neal et al., 2006). Consumer attitudes are developed and influenced by a consumer’s personality, lifestyle, past experiences, and environmental situations. Indeed, these are essential sources of behaviour that guide their choice of actions (Wells & Prentsky, 1996). Consumers gather information through perceptual, motivational, and learning processes (e.g., early experiences) to form attitudes and then use their attitudes to determine behavioural decisions whether they move toward or away from a given object or activity (Wells & Prentsky, 1996): consumers’ decisions to buy or refuse to buy. To sum up, consumer attitudes are evaluative responses expressing favour or disfavour and approval or disapproval (Eagly & Chaiken, 1993, 1998) and therefore play an important role in understanding consumers’ behavioural and buying decisions (Ajzen, 2008; Schiffman & Kanuk, 1997).

Malhotra (2005) stated that “*attitude can be conceptualized as a summary evaluation of an object*” (p. 477). A prevalent framework of attitude consists of three major components: cognition (beliefs); affect (feelings); and conation (behavioural intentions) (Albarracin et al., 2005; Blythe, 2013; Breckler, 1984; Maio et al., 2004; Neal et al., 2006; Rosenberg & Hovland, 1960). This tri-component attitude model contributes to a global measure of attitude. The premise of this model is that all three components explicate the formation of an individual’s attitude (Breckler, 1984) and best represent psychological responses and evaluative tendencies that reflect an evaluation of an object or activity (Albarracin et al., 2005). “*In general, people who have positive attitudes toward an attitude object should often possess beliefs, feelings, and behaviours that are favourable toward the object*” (Maio et al., 2004, p. 10). In contrast, people often form unfavourable beliefs, feelings, and behaviours toward an object if they have already had a negative attitude toward that object (Maio et al., 2004). Thus, this study adopts the tri-component attitude model to capture the comprehensive psychological responses of college athletic departments’ PE initiatives.

Cognition (Beliefs)

The cognitive component of attitude consists of the knowledge and perceptions which take the form of a consumer’s beliefs about an object or activity (Eagly & Chaiken, 1993, 1998; Verplanken et al., 1998). Beliefs are a consumers’ thoughts and expectations that an object or activity possesses specific attributes that lead to acceptable/beneficial or unacceptable/detrimental outcomes. For example, consumers believe Patagonia’s eco-friendly products not only preserve the natural environment but are also innovative and high quality. On the other hand, they believe that its eco-centric production (e.g., materials, recycling, packaging, and shipping) makes Patagonia’s products more expensive. Consumers’ beliefs are typically formed through an individual’s early experiences and knowledge (Schiffman & Kanuk, 1997) and play a prominent role in the formation of action (Duncan & Olshavsky, 1982).

Sport organizations adopting PE initiatives can engender positive cognitive perceptions of those organizations. Consumers tend to believe the consequences (i.e., benefits) of the PE initiatives when they are exposed to or informed by the impact of the actions through strategic marketing communications (McCullough et al., 2020). For example, sport fans are growing accustomed to seeing environmental education programs and campaigns at sporting events. These educational opportunities both increase awareness and change personal worldviews or beliefs about environmental issues (Casper et al., 2014). Ottman (2017) supports the notion that fact-based visual evidence (e.g., data and results) of PE performance strengthens individuals' beliefs about the benefits of the business organizations' environmental commitment.

Perceived beliefs are important precursors and psychological tendencies that motivate desired actions. Previous consumer behaviour studies in sustainability affirm that consumers who believe in benefits of PE initiatives are willing to be more active on green consumption (Channa et al., 2021; Lee et al., 2012), recycling (Inoue & Kent, 2012a, 2012b), donation to sustainability efforts (Walker, 2013), and environmentally friendly practices (Casper et al., 2014; Trail & McCullough, 2020). Therefore, it is essential for college athletics managers to combine a variety of PE initiatives with effective communication strategies so that they can elicit consumers' beliefs about the PE performance contributing to sustainable progress for society. However, no attempt has been made to provide empirical evidence about the effectiveness of different levels of college athletic department's PE performance. Specifically, it is important to determine whether sport consumers' beliefs about the benefits of the PE performance can be strengthened when they perceive and are presented with high PE performance information. Overall, the effectiveness of associating PE performance with consumers' positive attitudes has been in question. To this end, the following hypothesis is proposed:

Hypothesis 1: A college athletic department's high PE performance is more effective than its ordinary PE performance in enhancing sport consumers' perceived beliefs about the benefits of PE initiatives.

Affect (Feelings)

The affective component of attitude denotes an individual's positive and negative feelings about or emotional reactions to an object or activity (Agyeiwaah et al., 2021). A consumer expresses inner feelings based on his or her affective evaluations toward a product, brand, and service. Consumers' emotional reactions such as happiness, anger, and appreciation can result from their evaluations of positive or negative experiences and recollections of past experiences (i.e., learned predispositions) (Schiffman & Kanuk, 1997). Conversely, emotional reactions can be instant and require no previous experience. For example, a spectator will immediately feel disappointed upon realizing that he or she is not among the first 100 people to receive a special giveaway at the sporting event. These feelings can be accessed more quickly than a cognitive (i.e., belief-based) component of attitudes (Verplanken et al., 1998), and are thus a crucial driver of consumption behaviours (Schiffman & Kanuk, 1997).

A growing body of literature has supported a positive link between PE initiatives and consumers' affective component of attitude. Consumers form emotional responses through the process of evaluation when exposed to publicity about the benefits and efforts of an organization's PE initiatives. Nam and colleagues (2017) posit that the more information a consumer has about sportswear brands' eco-centric production efforts, the more favourable emotional reactions the consumer has toward those brands. Similarly, findings from previous research imply that consumers tend to feel grateful when they recognize companies' prosocial actions for public benefits (Hwang & Kandampully, 2015; Kwak & Kwon, 2016; Romani et al., 2013), including their PE initiatives (Blankenbuehler & Kunz, 2014; Jung & La, 2021; Septianto et al., 2021). In general, consumers' recognition of the benefits and efforts of PE initiatives is an important antecedent of the affective component of attitudes including individuals' perceived attitude and gratitude. Consumers' feelings are

evaluative responses, tendencies, and appreciation of products, brands, and services, in turn, influencing their choice of consumption behaviours.

Affective attitude-behaviour relations have been supported in the consumer behaviour literature on sustainability. Consumers who have favourable feelings toward college athletic departments' green stadium initiatives are more likely to donate to their PE initiatives in the future (Jin et al., 2011). Trail and McCullough (2020) found evidence that consumers' attitude toward a sport organization's sustainability campaign is a significant predictor of intentions to practice sustainable behaviours. In line with these findings, feelings of gratitude engendered by Patagonia's perceived PE efforts (i.e., corporate self-sacrifice) enhance intentions to sustainable consumption (Jung & La, 2021). Overall, researchers postulated that strengthening consumers' positive feelings/emotional responses through PE initiatives is an essential strategy to promote environmentally responsible behaviours among stakeholders. In turn, it could bring environmental, social, and economic benefits to sport organizations (Greenhalgh & Drayer, 2020).

Even though previous research supports that positive feelings can drive consumers' willingness to engage in environmentally responsible behaviours, whether a college athletic department's high PE performance is more effective in enhancing consumers' feelings remains unclear. In this study, general feelings and gratitude are conceptualized as promoting prosocial behaviours. Therefore, the following hypotheses were developed:

Hypothesis 2: A college athletic department's high PE performance is more effective than the ordinary PE performance in heightening sport consumers' general feelings toward the PE initiatives.

Hypothesis 3: A college athletic department's high PE performance is more effective than the ordinary PE performance in enhancing sport consumers' feelings of gratitude for the PE initiatives.

Conation (Behavioural Intentions)

The conative component of attitude encompasses a consumer's tendency to engage in a specific action toward an object or activity (Assael, 2004). A series of predispositions to try out a product or react negatively toward the product would be the conative component of attitude (Neal et al., 2006). In marketing and consumer behaviour research, the conative component of attitude is considered and measured as behavioural intention. Ajzen (1991) explicates that the behavioural intention is an indication of "*how much of an effort individuals are planning to exert in order to perform the behaviour*" (p.181). In this sense, behavioural intention refers to the individual's willingness to perform a given behaviour. Consumers' intentions to perform a particular behaviour can be influenced by perceptual processes and motivational factors (e.g., social influences and information) that consumers recall from past experiences and anticipate desired future outcomes. Hence, the stronger the intention one has to engage in a particular action, the more likely one is to execute that action (Ajzen, 1991).

The literature on environmental consumer behaviour has suggested a strong link between motivational factors and behavioural intentions. Stern (1999) noted that consumers' environmentally responsible behaviours (e.g., residential energy conservation, recycling, carpools) can be motivated by a combination of credible information, incentives, and social influences. In line with this premise, Freeling and colleagues' (2022) experimental study found that a green message underscoring fact-based evidence of a charity's climate solutions convinced donors to contribute more money to the charity. Similarly, sport fans' willingness to pay a sustainability fee was strengthened by the information cue illuminating that the sustainability fee can help upgrade their favourite team's green stadium rating (e.g., from LEED silver to LEED gold) (Greenhalgh & Drayer, 2020). Hence, the information conveying the desired future outcomes greatly increased the

likelihood of donors/fans' behaviour. Furthermore, the findings of sustainable marketing research suggest that consumers are likely to purchase eco-friendly products in response to the green marketing messages about the business' commitment to sustainability (Casadesus-Masanell et al., 2009; Kim & Oh, 2020; Kong & Zhang, 2013).

Consequently, the conative component of attitude, behavioural intention, is an evaluative response influenced by motivational factors and assumed to drive consumer behaviour (Ajzen, 2002). Measuring and monitoring the conative component of attitude are considered as the closest proxies that enable marketers to predict consumer behaviour/engagement, thereby assessing the effectiveness of marketing efforts. Casper and colleagues (2020) support the notion that the effects of PE initiatives on consumers' behavioural intentions can be measured to assess the effectiveness of given PE initiatives. To shed light on the effectiveness of PE initiatives, this study attempts to determine whether or not a college athletic department's high PE performance can be more effective in motivating consumers' intentions. Therefore, the following hypothesis was established:

Hypothesis 4: A college athletic department's high PE performance is more effective than the ordinary PE performance in reinforcing intentions to donate to the PE initiatives.

METHOD

Procedures

To evaluate the impacts of different levels of PE performance on sport consumers' psychological responses (i.e., the tri-component attitude model) including perceived beliefs, general feelings, feelings of gratitude, and donation intentions, the present study employed an experimental design with two fictitious scenarios of PE performance (see Appendix A): High PE performance and ordinary PE performance. In general, PE initiatives are activities, processes, and operations (Lee et al., 2010) that include a wide range of eco-friendly programs (e.g., water and waste management, use of sustainable energy, PE campaigns, etc.). Thus, various PE initiatives and descriptions were used as stimuli in this study. Moreover, as different levels of communication strategies influence consumer behaviour toward consideration of environmental concerns (McCullough et al., 2020), this study stimulated participants by displaying different numbers of messages pertaining to PE initiatives. In the high PE performance condition, participants were presented with eight descriptions: Volunteers' PE efforts, monetary donation to non-profit environmental organizations, in-venue waste management, team uniforms made from recycled materials, use of renewable energy, retrofitting campaign, food donation, and planting trees. In the ordinary PE performance condition, participants were presented with five descriptions: Installation of recycling infrastructure, volunteers' PE efforts, promotion of recycling, planting trees, and team uniforms made from recycled materials. The top of the PE performance for both conditions included a statement indicating that a college athletic department is actively involved in comprehensive sports greening programs.

Participants were randomly assigned to view one of the two PE performance scenarios to ensure better external validity (Winer, 1999) as well as the reliability and validity of the measured factors while controlling for the effect of elements of the individual characteristics (Kuehl, 2000). After participants completed the consent form, they were randomly given one of the conditions. Following exposure to the PE performance scenario, the participants were asked to answer a series of questions regarding their perceived beliefs, general feelings, feelings of gratitude, and donation intentions.

Participants

An online survey was developed by Qualtrics, and participants were recruited via Amazon's Mechanical Turk (MTurk), which Buhrmester and colleagues (2011) found to be a reliable, high-quality method of data collection. In addition, MTurk allows researchers to collect data in a reasonable amount of time while avoiding the interaction between the researchers and survey participants (Buhrmester et al., 2011). Since the study's target sample was general consumers of college sports, participants were limited to individuals who self-identified as being active fans of college sports by using a filtering question (i.e., participant's favourite sport). As an incentive to participate in the study, participants received 75 cents (USD) upon completing the survey. Of the 757 participants completed survey, the 144 surveys with the same answer for all questions or with extremely inconsistent answer combinations were eliminated (Hospers et al., 2005). Of the remaining 613 usable surveys, 57.4% were male and 58.4% were Caucasian. The average age of participants was 33.93 years old. The largest household income segment was between \$25,000 and \$45,000 (21.6%). A total of 309 participants were provided the high PE performance and 304 the ordinary PE performance. Table 1 presents the demographic information of the sample and participants in each experimental condition—that is, high PE performance and ordinary PE performance.

Table 1. Demographic information.

Variables	Categories	Overall (n = 613)		High PE Performance (n = 309)		Ordinary PE Performance (n = 304)	
		n	%	n	%	n	%
Gender	Male	352	57.4	194	62.8	158	52.0
	Female	256	41.8	112	36.2	144	47.4
	Other	5	0.8	3	0.9	2	0.9
Income	Under \$25,000	143	23.3	71	23.0	72	23.7
	\$25,000 - \$45,000	160	26.1	71	23.0	89	29.3
	\$45,000 - \$65,000	149	24.3	88	28.5	61	20.1
	\$65,000 - \$85,000	77	12.6	45	14.6	32	10.5
	\$85,000 - \$105,000	48	7.8	22	7.1	26	8.6
	Over \$105,000	36	5.9	12	3.9	24	7.9
Education	High School	102	16.6	39	12.6	63	20.7
	Professional School	28	4.6	9	2.9	19	6.3
	Associate Degree	65	10.6	23	7.4	42	13.8
	Bachelor's Degree	334	54.5	194	62.8	140	46.1
	Master's Degree	73	11.9	39	12.6	34	11.2
Season Ticket	Doctorate	11	1.8	4	1.3	6	2.0
	Yes	173	28.2	137	44.3	36	11.8
Race	No	440	71.8	172	55.7	268	88.2
	Caucasian	358	58.4	144	46.6	214	70.4
	African-American	38	6.2	17	5.5	21	6.9
	Hispanic	31	5.1	9	2.9	22	7.2
	Native American	10	1.6	6	1.9	4	1.3
	Asian	165	26.9	130	42.1	35	11.5
	Other	11	1.8	3	1.0	8	2.6

Measures

The measurement items used in this study were adapted and modified from previous research. Three items were adapted from Du and colleagues (2007) and Madrigal (2001) to measure perceptions of beliefs. A sample item includes "*I believe (the College Athletic Department A)'s environmental initiatives make a*

positive impact on the environmental protection.” Next, three items were adapted and modified from Jin and colleagues (2011) to measure donation intentions. One of the three items is measured by “*it is likely that I will donate to (the College Athletics Department A)’s sports greening movement.*” In terms of the affective component of attitude, the feelings of gratitude scale consisting of three items was adopted from Palmatier et al. (2009). An example of item is “*I feel grateful for (the College Athletics Department A)*”. Participants responded to all items measuring beliefs, gratitude, and intentions to donate on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Lastly, three items measuring general feelings toward PE initiatives were adapted from Mitchell and Olson (1981) and measured on a 7-point semantic differential scale (unfavourable/favourable, dislike very much/like very much, and despairing/hopeful).

Data analysis

The collected data were analysed using SPSS 26.0 and Mplus version 8.0. Descriptive and frequency analyses were conducted first, followed by confirmatory factor analysis (CFA) to test the psychometric properties. Goodness-of-fit of the model was assessed based on the following fit indices: chi-square per degrees of freedom (χ^2/df), comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR; Hu & Bentler, 1999). Because both groups of participants, despite receiving different levels of PE performance, completed the same questionnaires regarding their perceptions, it was inevitable to carry out a sequence of measurement invariance tests (i.e., configural, metric, and scalar measurement invariance tests) to gauge whether the participants in both groups had interpreted the questionnaires in an equivalent way.

In addition, because the level of individuals’ team identification could influence the overall results, team identification, measured on Robinson and Trail’s (2005) team identification scale, was controlled as a covariate. Moreover, two other demographic variables were controlled (i.e., gender and age) in that they possibly influence overall results (see Lee, 2009). Thus, a multivariate analysis of covariance (MANCOVA) was performed to determine the overall differences in two groups in perceived beliefs, general feelings, feelings of gratitude, and donation intentions. Between-subject conditions were two groups: the high performance and ordinary PE performance conditions, while within-subject variables were beliefs, general feelings, feelings of gratitude, and donation intentions. A Bonferroni adjustment was carried out to interpret significance of differences (i.e., .05).

RESULTS

Common method variance

Common method variance (CMV) could impact the study’s results because data were collected from a single source (e.g., sport consumers). To reduce the potential issue of CMV, different survey scales (i.e., 7-point Likert scale and semantic differential scale) were employed in the survey design stage. After collecting the data, further efforts were made by testing Harman’s single factor analysis to see if CMV was an issue in this study. Results of principal component analysis demonstrated that the single factor accounted for 18.6% of the variance, which is less than the threshold of 50% (Podsakoff et al., 2003). Hence, the impact of CMV on the current study was limited.

Manipulation check

For the purpose of testing manipulation check, participants’ perceptions of the college athletic department’s investment in the PE initiatives were measured to confirm the correctness of manipulation. To do that, a one-way ANOVA was performed as a manipulation check to determine whether the two conditions (i.e., high PE performance vs. ordinary PE performance) had been properly controlled. Participants’ perceptions of the

athletic department's investment in the initiatives served as a dependent variable. The results of ANOVA revealed a significant difference in the perceptions between the groups, $F(1, 611) = 10.50, p = .001$. According to Tukey's *post hoc* test, participants in the high PE performance indicated a significantly higher perceived investment ($M = 5.71, SD = .83$) than ones in the ordinary PE performance ($M = 5.45, SD = 1.12$). In other words, participants in the high PE performance felt that the college athletic department had exerted more effort in the high PE performance than participants in the ordinary PE performance. Overall, the results indicated that the manipulation was successful.

Descriptive analysis

In the group of high PE performance, values of skewness ranged from -1.26 to -.80, while values of kurtosis ranged from .22 to 2.15. In the group of ordinary PE performance, values of skewness ranged from -1.12 to -.18, while values of kurtosis ranged from -.91 to 1.34. In both groups, those values were within the cutoff criteria (Hair et al., 2010). In addition, a multicollinearity was not an issue because all values of the inter-factor correlations were less than .85 (Kline, 2015).

Construct validation

Cronbach's alpha scores were greater than .70, and composite reliability ranged from .78 to .93, thereby indicating the scale's internal consistency in both groups. All groups' factor loadings in both groups were significant and greater than the cutoff point of .50, except for three items. Factor loadings for the three items were deleted from the further analysis following Hair *et al.*'s (2010) suggestion (i.e., < .40). Construct's average variance extracted (AVE) in both groups exceeded the threshold of .50 (Fornell & Larcker, 1981). Those results indicated convergent validity was confirmed. Discriminant validity was also established since the square root of the structured AVE was greater than the correlation of constructs (see Table 2). In terms of the model fit, the results of the CFA for the high PE performance group showed a good fit, $\chi^2(48) = 125.092$, RMSEA = .072 (CI: 0.057, 0.088), CFI = .965, TLI = .953, and SRMR = .036, as did the results of CFA for the ordinary PE performance group, $\chi^2(48) = 98.844$, RMSEA = .059 (CI: 0.042, 0.076), CFI = .984, TLI = .978, and SRMR = .028. Table 3 presents the results of measurement scales.

Table 2. Descriptive statistics, Cronbach's alpha (α), and correlations of variables.

	1	2	3	4
High PE Initiatives				
1. Perceived Beliefs	.74			
2. Feelings	.724 [0.666, 0.774]	.76		
3. Gratitude	.590 [0.511, 0.659]	.567 [0.486, 0.639]	.79	
4. Donation Intentions	.313 [0.208, 0.411]	.512 [0.424, 0.590]	.271 [0.164, 0.372]	.90
Ordinary PE Initiatives				
1. Perceived Beliefs	.83			
2. Feelings	.767 [0.717, 0.810]	.87		
3. Gratitude	.722 [0.663, 0.772]	.717 [0.657, 0.767]	.87	
4. Donation Intentions	.445 [0.349, 0.530]	.582 [0.502, 0.652]	.394 [0.295, 0.485]	.92

Note. Square root of AVE is presented on the diagonal of the matrix; 95% percentile confidence intervals are provided.

Measurement invariance

Prior to conducting the main analysis, a series of measurement invariance tests (i.e., configural, metric and scalar) was performed to determine whether the groups had similarly interpreted the questionnaires. To that purpose, configural invariance test was carried out by constraining factor structure, but all parameters are freely estimated. The configural model revealed a good model fit ($\chi^2/df = 2.23$, RMSEA = .063, CFI = .975,

TLI = .970, SRMR = .050). Next, metric invariance model was developed by constraining all factor loadings to be the same across the two groups. The metric invariance model also showed a good model fit ($\chi^2/df = 2.30$, RMSEA = .065, CFI = .975, TLI = .968, SRMR = .049).

Table 3. Measurement scales.

Factor and Items	λ A/B	α A/B	C.R. A/B	AVE A/B
Perceived Beliefs		.79/.89	.79/.87	.56/.69
1. I believe [the College Athletic Department A] makes a real difference through its environmental initiatives	.705/.839			
2. I believe [the College Athletic Department A]'s environmental initiatives make a positive impact on the environmental protection	.744/.840			
3. I believe [the College Athletic Department A]'s environmental initiatives help protect our environment	.801/.825			
General Feelings		.82/.88	.81/.90	.59/.76
1. Unfavourable/Favourable	.789/.896			
2. Dislike very much/Like very much	.725/.876			
3. Despairing/Hopeful	.790/.860			
Feelings of Gratitude		.83/.90	.83/.90	.63/.76
1. I feel thankful for [the College Athletic Department A]	.838/.854			
2. I feel grateful for [the College Athletic Department A]	.792/.869			
3. I feel appreciative for [the College Athletic Department A]	.757/.904			
Donation Intentions		.95/.96	.93/.94	.81/.85
1. It is likely that I will donate to [the College Athletic Department A]'s sports greening movement	.888/.874			
2. I intend to make an effort to donate to [the College Athletic Department A] for its environmental efforts	.917/.942			
3. It is likely that I will donate to [the College Athletic Department A] for its environmentally responsible initiatives	.909/.953			

Note. Factor Loadings (λ), Cronbach's alpha (α), Composite Reliability (C.R.), and Average Variance Extracted (AVE); A = high PE performance, B = ordinary PE performance.

Although both the configural and metric models revealed a good fit to the data (Table 4), χ^2 statistics indicated a significant difference between the two models, $\Delta\chi^2 = 25.46$, $\Delta df = 8$, $p < .05$. It indicates that some of the factor loadings are not invariant across the two groups. To locate the non-invariance factor loadings, modification indices were inspected and revealed that two items in gratitude and attitude were considered non-invariance. Thus, partial metric invariance model was developed with the two items that were freely estimated in each group. The results showed that the partial metric model revealed a good model fit ($\chi^2/df = 2.19$, RMSEA = .062, CFI = .977, TLI = .971, SRMR = .045). χ^2 statistics indicated a non-significant difference between the two models, $\Delta\chi^2 = 6.32$, $\Delta df = 3$, $p > .05$. Additionally, metric measurement invariance was supported since changes in CFI, RMSEA, and SRMR were less than 0.010, 0.015, and 0.030, respectively (Chen, 2007). For the test of scalar invariance, the scalar invariance model was developed in which the intercepts were constrained to be equal across the two groups and was compared to the partial metric invariance model. χ^2 statistics was not statistically significant ($\Delta\chi^2 = 7.88$, $\Delta df = 5$, $p > .05$), thereby indicating that scalar invariance was established. Also, changes in CFI, RMSEA, and SRMR that are less than 0.010, 0.015, and 0.010 would indicate scalar measurement invariance across groups (Chen, 2007). Hence, the

series of measurement invariance tests demonstrated that participants in both groups similarly interpreted the questionnaires in an equivalent way.

Table 4. Measurement invariance tests across two groups: high and ordinary PE performance.

Model	df	χ^2	RMSEA	CFI	TLI	SRMR
Configural model	100	223.989	.063	.975	.970	.050
Metric model	108	249.383	.065	.975	.968	.049
Partial metric model	105	230.246	.062	.977	.971	.045
Scalar model	110	238.127	.062	.976	.972	.037

Between-group differences in sport consumers' perceptions

MANCOVA was performed with sport consumers' level of team identification, gender, and age controlled as a covariate. The results indicated a statistically significant difference between the groups, $F(4, 594) = 8.82$, $p < .001$; Wilk's $\Lambda = .944$, partial $\eta^2 = .056$. In the assessment of pairwise comparisons, participants who were presented with the high PE performance had significantly higher feelings of gratitude ($M = 5.49$, $p < .05$, power $> .80$) and intentions to donate ($M = 4.75$, $p < .001$, power $> .80$) than those who were shown the ordinary PE performance ($M = 5.25$, $M = 4.03$, respectively), after controlling for sport consumers' levels of team identification, gender, and age (Table 5). Therefore, Hypothesis 3 and Hypothesis 4 were supported. No significant differences were found between those in perceived beliefs and general feelings toward the PE initiatives, refuting Hypothesis 1 and Hypothesis 2. Considering the power values that were greater than .80, findings regarding significant differences in gratitude and intentions to donate to PE initiatives were meaningful. In addition, the results showed significant covariate effects on sport consumers' perceived beliefs, general feelings, feelings of gratitude, and donation intentions. Specifically, team identification accounted for 15% of the variance in sport consumers' perceptions of PE initiatives ($F[4, 594] = 27.14$, $p < .001$; Wilk's $\Lambda = .845$). Gender accounted for 3.7% of the variance in sport consumers' perceptions of PE initiatives ($F[4, 594] = 5.62$, $p < .001$; Wilk's $\Lambda = .963$). Age accounted for 4% of the variance in sport consumers' perceptions of PE initiatives ($F[4, 594] = 6.12$, $p < .001$; Wilk's $\Lambda = .960$).

Table 5. Results of MANCOVA: comparison between high and ordinary PE performance.

Hypotheses	Variable	Total Sample (SD)	High PE Performance (SE)	Ordinary PE Performance (SE)	F Statistic	Sig.	η^2	Supported
H1	Perceived Beliefs	5.63 (0.95)	5.66 (0.05)	5.60 (0.05)	0.48	.488	.001	No
H2	General Feelings	5.94 (0.95)	5.99 (0.05)	5.90 (0.05)	1.62	.203	.003	No
H3	Gratitude	5.37 (1.14)	5.49 (0.06)	5.25 (0.06)	7.34	.007	.012	Yes
H4	Donation Intentions	4.38 (1.71)	4.75 (0.08)	4.03 (0.08)	33.05	.000	.052	Yes

DISCUSSION

Despite the rapid advancements in collegiate sport research with respect to environmental sustainability, there is a surprising absence of experimental examinations of the effectiveness of PE initiatives in the literature. As a result, the effectiveness of sport organizations' PE investment remains in question. Therefore,

this study empirically examines whether sport consumers' beliefs, feelings, and behavioural intentions (i.e., tri-component attitude model) are affected differently when they are presented with high or ordinary PE performance by a college athletics department. The online-based experimental design applied two scenarios of PE performance. With the data from a sample of sport consumers in the U.S., a MANCOVA was conducted to test four research hypotheses.

Hypothesis testing results

The results indicated no significant differences between two groups in terms of beliefs about the benefits of PE initiatives (Hypothesis 1) or general feelings about PE initiatives (Hypothesis 2). Despite the lack of statistical significances in Hypotheses 1 and 2, it is worth noting that the overall mean scores of both perceived beliefs ($M = 5.63$) and general feelings ($M = 5.94$) toward the PE initiatives are relatively higher than gratitude ($M = 5.37$) and donation intentions ($M = 4.38$). These results indicate that sport consumers express fairly positive beliefs and feelings regardless of the high or ordinary PE performance presented by a college athletic department. That is, a college athletic department's ordinary PE performance still signals the value of such effort reflecting the positive perceptions of sport consumers.

In terms of Hypothesis 3, the results empirically demonstrate that the participants presented with the high PE performance scenario showed stronger feelings of gratitude than the participants presented with the ordinary PE performance scenario. This finding affirms that a college athletic department's high PE performance is more effective than its ordinary PE performance in fortifying sport consumers' feelings of gratitude. This finding is parallel with the previous research in that the sport fans' feelings of gratitude were greater for the PE effort when the sponsor of their favourite team helped the team save more operating (energy) costs (US\$800,000/year versus US\$12,000/year) by installing on-site solar panels (Kim et al., 2018). Similarly, Romani and colleagues (2013) provided evidence that higher levels of socially responsible investments engendered a stronger sense of gratitude. Therefore, high PE performance proves an effective and worthwhile investment because of its significant role in enhancing sport consumers' emotional engagement.

The results of this study also offer empirical evidence that the greater a sport consumer's perception of a college athletic department's PE investment, the stronger his or her intentions to donate to the PE effort. This finding supports Hypothesis 4 that a college athletic department's high PE performance is more effective than the ordinary PE performance in reinforcing sport consumers' willingness to donate to PE initiatives. Freeing and colleagues' (2022) work supports the results of Hypothesis 4, as they found that a non-profit organization's high effectiveness of climate solutions increased actual donations. Compared to donors who were exposed to mid-impact evidence, the average donation amount increased by 17% when donors were exposed to a message with high-impact evidence. According to the theory of planned behaviour (Ajzen, 2002), intention is an immediate precursor of action. In this case, measuring a consumer's behavioural intention can assist practitioners in gauging the effectiveness of their PE investments. Thus, this finding implies that the high PE performance enables practitioners to convince themselves of the return on investment in PE initiatives in the form of enhanced donation intentions and to achieve a major objective of those initiatives: To inspire and motivate stakeholders to engage in environmentally responsible behaviours.

Practical implications

The results of this study point to the differential impacts of PE performance on the tri-component model of attitude in collegiate sport. In addition, the study presents practical insights in the realm of strategic communication. A college athletic department's PE initiatives not only minimize adverse environmental impacts, but also reinforce sport consumers' affective and conative components of attitudes toward its higher levels of PE performance. To maximize the effectiveness of these initiatives, college athletics managers must

implement a variety of essential PE initiatives in conjunction with disclosures of information on PE performance.

College athletic departments that implement PE initiatives are encouraged to communicate their efforts. Sport consumers' positive attitudes can be enhanced when they are informed about and exposed to the impact of PE performance. College athletics managers can harness their easily available communication platforms such as official websites, social media, video boards, prominent alumni, mascots, and green team volunteers to share their genuine commitment to environmental sustainability. For instance, the University of California-Berkeley athletics department issued a press release about its PAC-12 Basketball Zero Waste Challenge. According to the release, "*The Golden Bears have won five of the last six basketball challenges, posting a diversion rate of 92% or higher in each of the victories*" (Cal Athletics, 2023). Ohio State University's athletic department tweeted, "*the overall zero waste diversion rate for all 13 zero waste events in fiscal year 2023 is 90.81 percent*" (Ohio State Athletics, 2023). The tweet included graphs of persuasive diversion rates. Taken together, it is crucial for managers to leverage the high PE performance by communicating its positive consequences (e.g., triple bottom line) of the PE efforts to bolster sport consumers' affective and behavioural responses.

Another practical implication based on these findings is that presenting evidence (e.g., assessment data) of a college athletic department's PE performance could elicit sport consumers' gratitude and willingness to make donations. Displaying PE performance numerically or with scientific evidence can make environmental impacts more tangible and compelling to stakeholders (Ottman, 2017). Food donations made by the University of Notre Dame's athletic department were featured in a news story that underlined its PE performance: "*The University of Notre Dame donated more than 8 tons of food to Cultivate Food Rescue during the recently completed home football season, or about 2,300 pounds per game, helping to battle hunger and reduce food waste in the local community*" (Blasko, 2022). The emphasis on the amount of philanthropic giving to environmental causes could foster emotional and behavioural engagement. Kwak and Kwon (2016) supported our managerial insight that sport fans showed more gratitude when their favourite team made larger charitable donations. Therefore, college athletics managers should measure the PE performance and communicate the social and environmental impact validated by evidence to strengthen the emotional and behavioural engagement of their stakeholders.

From a corporate partner's perspective, the findings from this study imply that corporate partners of college athletic departments who provide valued resources to enhance capabilities of PE initiatives may benefit from the affiliation with high PE performance. Xavier University athletics partnered with the Formica Corporation, a manufacturer of surfacing materials, to organize and execute a Threes for Trees campaign. As a part of its PE campaign, the Formica Corporation pledges to plant ten trees for every three-point made by the men's basketball team. This corporate-sponsored PE initiative has resulted in the planting of 18,860 trees since 2015 (Xavier University Athletics, 2022). Through such communication efforts, favourable attitudes could be shared with or transferred to a corporate partner when sport consumers are informed about the sponsor's genuine interest in and dedication to high PE performance (Kim et al., 2018). In this sense, the partners should take advantage of college athletic departments' communication platforms to publicize the value of cause-linked alliance enacting advanced and beneficial PE initiatives. At the same time, college athletics managers must be strategic in creating mutual benefits to advance higher levels of the partnering PE initiatives.

Limitations and future research

The findings of this study help undergird the literature on environmental sustainability in collegiate sport and extend the knowledge of the effectiveness of PE initiatives. However, the following limitations should be noted.

First, this study adopted the tri-component attitude model—sport consumers' psychological responses—to measure the effectiveness of a college athletic department's PE initiatives. Future research could include additional outcome measures such as actual donation amounts, frequency of participation in green events, and engagement metrics (e.g., message recall, event satisfaction, and social media impressions) to predict the return on investment of the PE initiatives more precisely.

Second, the authors used comprehensive PE initiatives in the performance-based scenarios (high vs. ordinary) to examine the effects of PE performance on sport consumer attitudes. Even though high PE performance was shown to be more effective in increasing affective and conative components of attitudes, it would be worthwhile to identify which PE initiative is more influential in improving consumer attitudes. As an extension of this study, researchers could use benefit-based scenarios to test the effectiveness of PE initiatives. That is, three scenarios can be framed based on environmental benefits (e.g., zero waste events), social benefits (e.g., installation of energy-efficient products to low-income families), and economic benefits (e.g., cost saving). This experimental design using benefit-based scenarios could provide empirical evidence of the differential impacts of PE initiative types on sport consumer attitudes, thereby determining whether a certain type of PE initiative is more influential in the outcome measures.

Third, the sample sizes in this study were sufficient to run a MANCOVA to determine the overall differences in the high and ordinary PE initiative groups; however, the composition of the respondent population was lopsided in terms of gender (62.8% males vs. 36.2% females) and race (70.4% Caucasian, 11.5 % Asian, 7.2% Hispanic compared to ordinary PE performance institutions). Future studies should aim for equal sample sizes to obtain more generalizable outcomes.

Lastly, for an emerging trend in corporate-sponsored PE initiatives in the sport sector (McCullough et al., 2022), follow-up studies should examine and provide evidence of the effectiveness of corporate-sponsored PE initiatives. Practitioners and academics must understand how to achieve sponsorship objectives, assess effectiveness/outcomes, and develop communication strategies of the corporate-sponsored PE initiatives. Findings and insights from such research could shed light on the benefits of corporate sponsors' PE investments, and therefore could attract more corporate partners to advance the partnering PE initiatives.

CONCLUSIONS

This experimental study adopted two scenarios to test the differential impacts of a college athletic department's PE performance on the tri-component attitude model. Empirical evidence found in this study indicates that college athletic departments' high PE performance can capture a wider range of sport consumer attitudes, especially feelings of gratitude and donation intentions. Further, sport consumers' attitudes improve when they receive information about the high PE performance. Therefore, it is crucial for the college athletic managers to design and disseminate impactful PE information in order to capitalize on the benefits being generated by their stakeholders (McCullough et al., 2020). To this end, the greater availability of PE information in public can be seen as an industry standard and benchmarking practices for peer institutions' environmental commitments.

To date, experimental evaluations of the effectiveness of sport organizations' PE initiatives is in a nascent stage of development. More research using robust methodologies is required to identify factors of a cause-effect relationship to assess the effectiveness of the PE initiatives. In turn, providing sufficient evidence of effectiveness enables sport practitioners to optimize the process and implementation of their PE initiatives. For this reason, the findings of this study serve as foundational evidence for future research in sport management around the effectiveness of sport organizations' PE initiatives.

AUTHOR CONTRIBUTIONS

Yu analyzed the data and wrote the Method and Results sections. Dabbs, Kim, and Nam designed the study, collected the data, and wrote other sections of the manuscript. All authors contributed to a review, revision, and final proofreading of the manuscript.

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