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Sport teams' promotion of plant-based food consumption among fans

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ABSTRACT

The study's goal is to examine the downstream relations of fan awareness of a favorite sport team's pro-environmental food initiatives, considering fans with different degrees of team identification. Building upon the Awareness-to-Action Continuum, the authors propose two pathways that may help explain reported plant-based food consumption among fans (i.e. eating vegetables, eating vegan food, and avoiding meat), particularly at high (vs. low) degrees of team identification: team value internalization and fan-team personality match. Study 1 surveyed 799 fans of 12 different sport teams from various countries, which had implemented pro-environmental food initiatives in the past. Study 2 used a survey-experimental design to manipulate identification with one selected team from the U.S. ($n = 356$ fans) and assessed the downstream relations of fan awareness of the team's pro-environmental food initiatives. The authors control for attitude and subjective norm in their analyses and show that the levels of team identification associate with the relation between fan awareness and reported consumption of plant-based foods via fan-team personality match but not via value internalization. Ironically, the perception of the team's personality as superior to their own personality among low-identification fans is negatively related to the adoption of a plant-based diet despite high awareness levels.

KEYWORDS

Environmental sustainability; sustainable consumption; team identification; internalization of team values; fan-team personality match; sustainable food behaviors

Introduction

The consumption of plant foods (fruits, vegetables, grains, legumes, nuts, and seeds) not only has health benefits, but helps fight climate change via reduced greenhouse gas emissions (Segovia-Siapco & Sabaté, 2019). The World Health Organization (2021) defines plant-based diets as diets that "constitute a diverse range of dietary patterns that emphasize foods derived from plant sources coupled with lower consumption or exclusion of animal products" (p. 1). Yet, it can conflict with people's meat enjoyment and habits (Pohjolainen et al., 2015). This is particularly true for sport fan consumption contexts, such as in-stadium environments, where meat-based options often predominate (Parry et al., 2017, Williams & Williams, 2013).

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Still, more and more professional sport teams strategically promote plant-based diets in stadium environments to not only reduce their own carbon footprint, but also encourage fans to choose more sustainable food options (Henly & Krenza, 2015). Within the context of the promotion of plant-based diets, it is of great interest whether fan awareness of the teams' initiatives relates positively to plant-based food choices in daily life. Yet, there might be differences in relations between lowly and highly identified fans. Lowly identified fans were found to support pro-environmental activities of sport organizations more strongly compared to highly identified fans (Casper et al., 2017). The authors identify a cluster of highly pro-environmental, but lowly identified fans who stated that the team's pro-environmental activities made them more likely to purchase game-day tickets, take part in pro-environmental activities on game-days, and undertake pro-environmental activities at home. In another study on student fans, no differences between lowly and highly identified students were found regarding the relations between a favorite team's environmental practices and behavioral intentions to engage in daily pro-environmental behavior (Inoue & Kent, 2012b). Our study aims to resolve these inconsistencies by assessing downstream relations of fan awareness of a favorite sport team's pro-environmental food initiatives, considering highly and lowly identified fans and looking at the adoption of plant-based diets, according to self-reports.

To explain the mechanisms of potential differences in relations between highly and lowly identified fans, two factors might be relevant: (1) internalization of team values, that is, fans' congruent value system given how they see the team and act (Inoue & Kent, 2012b, Pape et al., 2023), and (2) fan-team personality match, that is, the match between the self-evaluation of one's own personality and the personality of the team (Rickson, 2021). The following research question guided our research: Do internalization of team values and fan-team personality match explain differences in relations between fan awareness of a favorite sport team's pro-environmental food initiatives and the adoption of plant-based diets?

The present study uses the Awareness-to-Action Continuum as the theoretical lens because it allows for the consideration of these mediators that may help explain how and when fan awareness may relate positively to sustainable consumption practices (here: plant-based food). The study contributes to the literature in sport management in the domain of both food provision to fans (specific context) and sustainable development (broad context). Specifically, we show that fan awareness does not always relate positively to the adoption of plant-based diets. This is because lowly (but not highly) identified fans perceive the team's personality as superior to their own personality. We identify team identification as one important boundary condition that has not been considered before in this context (e.g., Walker & Kent, 2013).

Referring to the broad context of sustainable development, the study's findings largely support insights from previous studies that revealed positive relations between a sport team's pro-environmental fan engagement initiatives and identified fans' behavioral intentions to act sustainably at events and in their everyday lives (see Appendix for an overview of studies). Trail and McCullough (2021) pursue a holistic approach and longitudinally modeled the decision-making processes of fans. They not only explain sustainable fan behaviors during games, but also sustainability advocacy and sustainability behavioral change intentions in the community. Inoue and Kent (2012b), in contrast, follow a focused approach with the aim to explain differences in relations between highly

and lowly identified fans (similar to the goal of the present study). They consider the mediating role of value internalization and the moderating role of team identification. By revealing how and when fans may adopt plant-based diets, we extend Inoue and Kent's (2012a) conceptual frame. In what follows, we introduce the theoretical framework of our work before we present and discuss the results of two empirical studies.

Theoretical framework

To better understand fan responses to pro-environmental initiatives, scholars tested models that are based in fields such as environmental sustainability, consumer behavior, and marketing (Appendix). They consider the following domains: waste-management behaviors, such as recycling; energy-saving behaviors, such as carbon offsetting; mobility behaviors, such as active vs. passive traveling; and dealing with scarce resources in general (Casper et al., 2014, Casper et al., 2017, Martin et al., 2015, McCullough & Cunningham, 2011, Trail & McCullough, 2018, 2020, 2021). One void in the research relates to the pro-environmental food choices made by fans. Next, we develop our arguments on how fans become aware of their favorite team's pro-environmental food initiatives, what the potential downstream associations of high awareness levels are, and what factors relate to the adoption of plant-based diets in daily life.

Awareness-to-action continuum

Barnes' (2013) Awareness-to-Action Continuum describes how individuals become ecologically literate during their lives. According to Barnes (2013), there are five phases: (1) awareness and appreciation, (2) knowledge and understanding, (3) attitudes and values, (4) problem solving skills, and (5) personal responsibility and action. While phases (2) and (4) are peculiar for the acquaintance of literacy, phases (1), (3), and (5) are part of communications models in the fields of social psychology, marketing, and media (e.g., Do Paço et al., 2013). In the present context, phase (1) relates to fan attentiveness to a team's pro-environmental diet initiatives. In phase (3), attitude relates to a fan's favorable or unfavorable evaluation of pro-environmental diets. Beside attitude, values and personality factors matter (Barnes, 2013; in the present context of team sports, we refer to *team value internalization*; Inoue & Kent, 2012a; and *fan-team personality match*; Kristof, 1996). In the final phase, fans' responsibility and action can be seen in the levels of sustainable consumption (here: plant-based diets). In what follows, we define each of the main components of the model and make assumptions about their interrelationships.

Fan awareness of a team's pro-environmental food initiatives and its downstream relations

Fan awareness of a favorite team's pro-environmental food initiatives can be defined as "the perception of the activities [here: pro-environmental food initiatives; *added by the authors*] being carried out by members of a team [here: the favorite sport team; *added by the authors*] in a given context" (Gallego et al., 2011, p. 454; see also Barnes, 2013). According to the Awareness-to-Action Continuum, awareness is a prerequisite for important downstream relations to occur (Barnes, 2013). There are two alternative views of how

fan awareness of a team's pro-environmental food initiatives may relate to the consumption of a plant-based diet.

One view is that fans internalize team values, that is, they adapt their own value system if they perceive that team values are changing (here: becoming more sustainable; Inoue & Kent, 2012a). Internalization of values describes the extent to which values and behaviors of other people or organizations are accepted and adopted in one's own value system (Kelman, 1961, 2006). Values are accepted when people perceive that behaviors are congruent to their own values. Their value system changes and people adopt organizational behaviors as guiding principles (Ashforth & Mael, 1989, Kelman, 1961, 2006). Awareness may positively relate to value internalization because the high awareness of a concept makes people reflect on value-relevant own behaviors in relation to the concept (here: sustainable development). Most importantly, sustainable behaviors have a positive connotation (since they are desirable and perceived favorably in society; Corral Verdugo, 2012) and matter in the context of fandom (since eating is a habitual part of following sports games and fandom; Koenigstorfer, 2018), particularly when fans perceive a match between pro-environmental initiatives and sport teams (McCullough & Trail, 2023). Indeed, fans can perform value-relevant own sustainable behaviors in daily life (Inoue & Kent, 2012a). Thus, we hypothesize the following:

H1: There is a positive relationship between fan awareness of a sport team's pro-environmental food initiatives and team value internalization.

Another view is that fans change their perception of an organization's personality compared to their own personality, and act accordingly. When individuals become aware and eventually gain knowledge about pro-environmental initiatives, they not only eventually internalize values based on organizational values, but they also evaluate an organization's personality, that is, the set of human characteristics associated with a brand [here: the favorite sport team; *added by the authors*] (Aaker, 1997, p. 347), and relate the organization's personality to their own personality (Kristof, 1996). Personality perception is part of the Awareness-to-Action Continuum's cognitive evaluation stage (3). Indeed, individuals seek for congruency between their own personality and a brand's (here: a team's) personality (Sirgy, 1982). In the present context, the team personality may be evaluated more positively (relative to one's self-evaluation) with increasing awareness levels, because pro-environmental values are desirable (Stadler-Blank et al., 2018). The positive perception may be due to the match between the team's non-sport related activities and the team itself (McCullough & Trail, 2023). Fan-team personality match can be defined as "the compatibility between people [here: fans; *added by the authors*] and organizations [here: teams; *added by the authors*]" (Kristof, 1996, p. 4). The resulting personality match is meaningful because a team often becomes part of fans' identity (see Belk, 1988, for conceptual arguments, and Derbaix & Decrop, 2011, for empirical evidence). High awareness levels of a team's pro-environmental initiatives might negatively relate to fan-team personality match. If fans are highly aware of initiatives, they might feel that the team's personality increases compared to one's own personality (i.e.,

the team is rather superior than inferior; Derbaix & Decrop, 2011). Thus, we hypothesize the following:

H2: There is a negative relationship between fan awareness of a sport team's pro-environmental food initiatives and fan-team personality match (i.e., the degree to which fans perceive their own personality compared to the team's personality).

Mediating roles of team value internalization vs. fan-team personality match

The downstream relations of value internalization have been proposed in Kelman's (1961) landmark article on processes of opinion change and researched in the psychology literature (e.g., Hannah et al., 2016). Kelman (1961) argued that one important downstream relation of internalization is "relevance of values to issue" (p. 67; the issue in the present case is sustainable development). This means that the "behavior [. . .] manifests itself whenever the values on which it is based are relevant to the issues at hand", even when it is "idiosyncratic, flexible, and complex" (as seen for dietary behavior) (Kelman, 2006, p. 6). These assumptions are in agreement with the propositions from the Awareness-to-Action Continuum. In the team sport context, Inoue and Kent (2012a) argued that the degree to which fans internalize a team's values may relate to fans' daily pro-environmental behavior, grounding their hypothesis in Kelman's (2006) work. They found a positive relationship between value internalization and pro-environmental behavior as well as behavioral intention to support a pro-environmental initiative. Accordingly, we hypothesize that internalization relates positively to the consumption of plant-based food, and that internalization functions as a mediator of the relationship between fan awareness of a sport team's pro-environmental food initiatives and fans' reported consumption of plant-based food. The mechanism can be explained by fans' willingness to adopt values for identity-expression purposes (Inoue & Kent, 2012a). H3 and H4 are stated as follows:

H3: There is a positive relationship between team value internalization and fans' reported consumption of plant-based food.

H4: Team value internalization mediates the relation between fan awareness of a sport team's pro-environmental food initiatives and fans' reported consumption of plant-based food.

The downstream relations of organization-person match have been postulated in the Action-to-Awareness Continuum and studied mostly in the context of human resources, revealing positive relations on important downstream variables, such as job satisfaction, loyalty to the organization, commitment, as well as performance-, attraction-, and tenure-related factors (dos Santos & de Domenico, 2015). In sport management, personality match has been considered for sponsored athletes and sponsors, with positive downstream consequences on behavioral intentions to

purchase products from the sponsor (e.g., Dees et al., 2010). Thus, there is both conceptual and empirical evidence for positive relations with approach behaviors and behavioral intentions. One can therefore assume that high levels of self-perception (e.g., self-esteem), reflective of high personality match, make fans themselves engage in pro-environmental behaviors (here: adopt plant-based diets). We hypothesize that the match in personality between the fan and the team relates positively to the consumption of plant-based food, and that personality match functions as a mediator of the relationship between fan awareness of a team's initiatives and fans' consumption of plant-based food.

H5: There is a positive relationship between fan-team personality match and fans' reported consumption of plant-based food.

H6: Fan-team personality match mediates the relation between fan awareness of a sport team's pro-environmental food initiatives and fans' reported consumption of plant-based food.

Moderating role of team identification

Identification describes the process by which group influence is accepted because a relationship should be established or maintained (Ashforth & Mael, 1989, Mael & Ashforth, 1992). When individuals identify with objects, they classify themselves in categories based on specific characteristics. Highly identified individuals perceive to belong to a certain group, which helps them form a social identity (Ashforth & Mael, 1989). For example, highly identified organizational members (fans) have been described to refer to "we" rather than "they" when talking about their organization (favorite team) (Mael & Ashforth, 1992; see Inoue & Kent, 2012a, for the sport context).

In one of their seminal studies, Wann and Branscombe (1990) found that fans high in team identification bask in reflected glory (BIRG) more and cut off reflected failure (CORF) less compared to fans low in team identification. Most importantly to the present study, highly identified fans differ from lowly identified fans not only with regard to the degree to which they intend to attend sports games or are willing to invest time and money into a team, with highly identified fans acting more closely according to their motives (Kim et al., 2013), but also with regard to the degree to which they integrate new information about their team into their own value system and personality. For example, even the relocation is no reason for some highly identified fans to stop connecting with, and caring about, the team (Foster & Hyatt, 2007). Regarding sustainable consumption, Casper et al. (2017) found that a cluster of lowly identified fans responded more positively to a team's pro-environmental initiatives and could be considered a more attractive target group when promoting sustainability activities. In the present context, highly identified fans might be more likely to perceive the team's values as similar (arguing for positive relations via internalization), but less likely to perceive their own personality as superior relative to the team's personality (arguing for negative relations via fan-team personality match)

with increasing awareness levels. For the latter relationship, lowly identified fans may be particularly prone to act according to (high) relative evaluations of their own personality. H7a and H7b are postulated as follows:

H7: The mediation (a) via team value internalization is stronger for fans with high team identification compared to fans with low team identification, while the mediation (b) via fan-team personality match is stronger for fans with low team identification compared to fans with high team identification.

We also assess two key constructs from the Theory of Reasoned Action (TRA) that are among the most powerful determinants of sustainable behavior (McCullough & Cunningham, 2011, Scalco et al., 2017, Trail & McCullough, 2021): *attitude* (here: toward pro-environmental food consumption) and *subjective norm* (here: regarding pro-environmental food consumption). Attitude toward a certain concept is defined as "a person's general feeling of favorableness or unfavorableness for that concept" (Ajzen & Fishbein, 1980, p. 54). Subjective norm is a person's "perception that most people who are important to him think he should or should not perform the behavior in question" (Ajzen & Fishbein, 1980, p. 57). Subjective norm positively relates to recycling intentions of a sport team's spectators (McCullough & Cunningham, 2011). Compared to the Theory of Planned Behavior, which includes perceived behavioral control as an additional construct, the TRA assumes that behaviors are under voluntary control by people. The latter can be assumed to be the case for food consumption. From early childhood on, people learn to have control over what they eat by developing food preferences (Birch & Fisher, 1998). Building upon the TRA and these findings, we hypothesize the following:

H8: There is a positive relationship between attitude toward pro-environmental food consumption and fans' reported consumption of plant-based food.

H9: There is a positive relationship between subjective norm regarding pro-environmental food consumption and fans' reported consumption of plant-based food.

Figure 1 summarizes the proposed relationships.

The present study

The study aims to assess downstream relations of fan awareness of a favorite sport team's pro-environmental food initiatives on plant-based food consumption via team value internalization and fan-team personality match for highly (vs. lowly) identified fans. In doing so, we assume that fans can have different awareness levels of their favorite team's pro-environmental initiatives. In our surveys, we limit our analysis to explicit awareness, that is, the awareness levels that people consciously report (Frith & Frith, 2008).

Study 1 aims to find out whether, how, and when, fan awareness of sport teams' sustainable initiatives relates to plant-based food consumption, using a survey-based research design. Participants are fans from various teams who have reportedly promoted

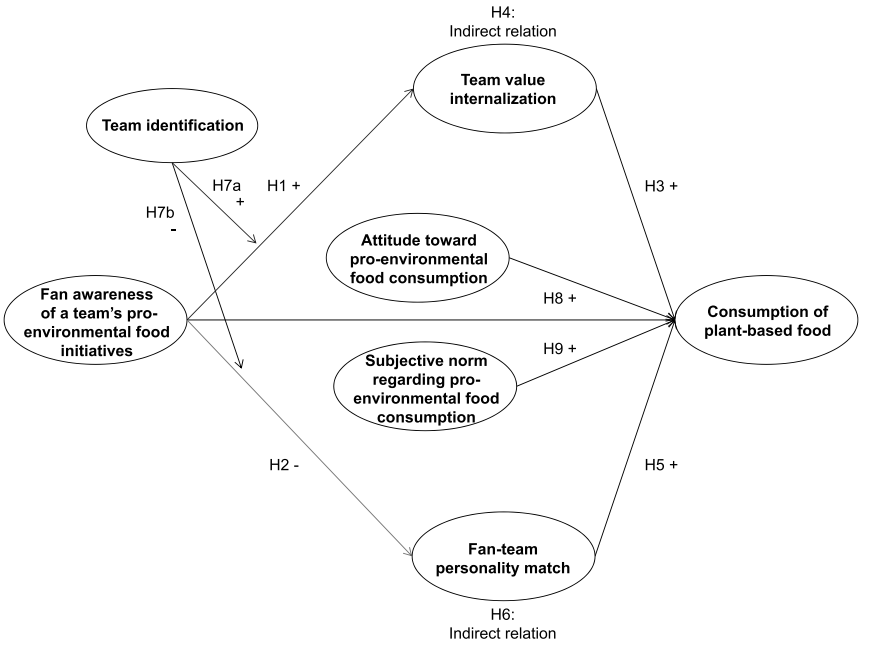

Figure 1. Model of how and when fan awareness of a sport team's pro-environmental food initiatives may relate to consumption of plant-based food. *Notes*. Paths indicate associations between variables (no cause-and-effect relationships).

plant-based food options toward fans in at least one initiative. Study 2 aims to replicate the results for one team, using a survey-experimental design. We note that, while the studies consider the order of how process evidence can be provided (assessing awareness first and food choices last), they consider only one point in time and no cause-and-effect relationships.

Study 1

Method

Design and procedure

A cross-sectional survey was distributed to fans of 12 different sport teams that had implemented plant-based food initiatives as part of their ongoing pro-environmental activities (Table 1). Team selection was based on an extensive online search (searching homepages of various sport teams and considering sustainability awards). Additionally, we asked 12 experts from five countries to state teams that they know of that provide sustainable food at events and implement initiatives that inform and educate their fans about the matter. All teams used a multi-channel strategy (online and offline, in-stadium and out-of-stadium) to promote and implement their initiatives.

All procedures were in accordance with the ethical standards of the university's Faculty Board, which acts as the local ethics committee for studies outside the Faculty of Medicine and approved the study, and with the 1964 Helsinki Declaration and its later amendments.

Table 1. Overview of teams and number of participants (study 1, $N = 799$ [100%]).

Teams	Sport, League, Country	Number of Participants (%)
Boston Red Sox	Baseball, MLB, U.S.	50 (6.3%)
Forest Green Rovers	Soccer, Football League One, Scotland	79 (9.9%)
Hibernian FC	Soccer, Scottish Premiership, Scotland	88 (11%)
Liverpool FC	Soccer, Premier League, England	69 (8.6%)
Montreal Canadians	Ice hockey, NHL, Canada	50 (6.3%)
Portland Thorns FC and Timbers	Women's soccer, National Women's Soccer League; men's soccer, Major League Soccer, U.S.	87 (10.9%)
Portland Trailblazers	Basketball, NBA, U.S.	50 (6.3%)
Sacramento Kings	Basketball, NBA, U.S.	68 (8.5%)
San Francisco 49ers	Football, NFL, U.S.	59 (7.4%)
Southampton FC	Soccer, Premier League, England	63 (7.9%)
Tottenham Hotspurs	Soccer, Premier League, England	82 (10.3%)
VfL Wolfsburg	Soccer, Bundesliga, Germany	54 (6.8%)

Participants

799 fans of 12 sport teams served as participants for the study. They were recruited via online fan forums between May and August 2021. A raffle with three incentives was set up (€30 vouchers for local shops). The sample size met the recommended size of 162 participants to detect mediation of a small-to-medium effect size ($f^2 = 0.26$) for the paths from the independent variable to the two mediators (a paths) and a small-to-medium effect size ($f^2 = 0.26$) for the paths from the mediators to the outcome variable (b paths), specifying a power level of 0.80 (Fritz & MacKinnon, 2007).

Measures

Table 2 provides an overview of the items that were assessed in the survey (anchored at 1 [lowest rating] and 7 [highest rating]). The three-item scale for fan awareness of pro-environmental food initiatives (Cronbach's $\alpha = .79$) was taken from Walker and Kent (2013) and adapted to the context of the study. Internalization of team values was measured via four items used by Inoue and Kent (2012a; $\alpha = .84$). The scores for fan-team personality match ($\alpha = .74$) were obtained by separately measuring individuals' own personality and team personality characteristics (Kristof, 1996). The following characteristics were taken in reference to Stadler-Blank et al.'s (2018) personality scale: successful, determined, role model, caring for the environment, and health-promoting.[1] Difference scores were calculated as the level of congruence between the profiles (based on participants' evaluation of their own personality and team personality ratings). Attitude toward pro-environmental food consumption was measured on four semantic differentials and subjective norm was assessed via four items, both taken from Ajzen and Fishbein (1980; $\alpha = .89$ and $\alpha = .85$, respectively). Team identification was measured via the six-item scale taken from Inoue and Kent (2012a; $\alpha = .80$; see Mael & Ashforth, 1992, for the original scale). The measure of

[1] A focus group with six fans revealed that these five items were most relevant. Based on these insights, the original scale was slightly adapted: "caring" was complemented with "for the environment" and "community-oriented" was replaced by "health-oriented" to consider the fans' sustainability and health expectations (which are often described as lifestyle of health and sustainability [LOHAS]).

Table 2. Overview of variables, means and standard deviations for study 1 and 2.

		Study 1		Study 2			
				High Team Identification		Low Team Identification	
Variables	Items	Mean	SD	Mean	SD	Mean	SD
Fan awareness of pro-environmental food initiatives	I am aware of the pro-environmental diet activities of [the team] It pleases me to know that [the team] promote pro-environmental diets I know of [the team's] effort to promote pro-environmental diets	4.15	1.57	4.69	1.38	4.74	1.43
Fan-team personality match[1]	To what extent do you perceive [the team, yourself] as . . . Successful Determined Role model Caring for the environment Health-oriented	−0.22	1.37	−0.38	0.91	−0.04	0.96
Internalization of team values	What [the team] stand for is important to me I find that my values and [the team's] values are very similar The reason I prefer [the team] to others is because of what they stand for, their values If the values of [the team] were different, I would not be as attached to them	4.61	1.42	5.06	1.12	4.82	1.13
Attitude toward pro-environmental food consumption	How . . . do you rate pro-environmental diets? Bad – good Harmful – beneficial Unpleasant – pleasant Unenjoyable – enjoyable	5.09	1.43	5.57	1.13	5.38	1.30
Subjective norm regarding pro-environmental food consumption	My friends think I should eat a pro-environmental diet My family thinks I should eat a pro-environmental diet Other fans think I should eat a pro-environmental diet [The team] I am a fan of thinks I should eat a pro-environmental diet	3.32	1.32	4.34	1.49	4.33	1.64
Team identification	When someone praises the [the team], it feels like a personal compliment [The team's] successes are my successes When someone criticizes the [the team], it feels like a personal insult When I talk about the [the team], I usually say "we" rather than "they" If a story in the media criticized the [the team], I would feel embarrassed I am very interested in what others think about the [the team]	4.42	1.30	4.91	1.22	4.86	1.25
Plant-based food consumption[2]	I ate vegan diets in the past two weeks I ate vegetables in the past two weeks I avoided meat in the past two weeks	11.07	4.27	12.34	4.15	12.02	4.41

SD: Standard deviation. [1] Difference scores are reported; positive (negative) values indicate higher (lower) ratings for themselves compared to the team. [2] Sum scores are reported.

plant-based food consumption relates to the adoption of a plant-based diet, using three dietary practices that resemble such food intake: eating vegetables, eating vegan foods, and avoiding meat, as identified by Povey et al. (2001) (a sum score was used).[2]

Data analysis

SPSS 29.0 was used to calculate means, standard deviations, and correlations. The validity and reliability of the latent variables were assessed via Mplus 7.31. The software was also used to test the hypothesized relationships of the moderated serial mediation model via a path analysis (Muthén et al., 2017).

The model includes fan awareness of pro-environmental food initiatives as the independent variable, team value internalization and fan-team personality match as parallel mediators, team identification as a moderator of the independent variable-mediator paths, and plant-based food consumption as the dependent variable. Additionally, attitude and subjective norms are modeled as predictors of the dependent variable. All direct and indirect paths are included in the model. The approach allows to test for both independent variable-mediator paths (a paths), the mediator-dependent variable paths (b paths), for the indirect relation between fan awareness and plant-based food consumption via both mediators, as well as for moderation of team identification on both a paths. To describe interactions, conditional relations were examined at low (mean − 1 SD), medium (mean), and high (mean +1 SD) levels of the moderator. Also, 95% bias-corrected confidence intervals (CIs) were used for significance testing purposes of the mediation (significance is given if zero is not included in the CIs).

Results and discussion

Table 3 provides an overview of the sample. Table 4 shows the correlations between the variables. Table 5 and Figure 2 report the results of the modeling. The model explains 30.4% of the variance in team value internalization, 10.1% of the variance in fan-team personality match, and 32.0% of the variance in plant-based food consumption. In support of H1, the relationship between fan awareness and team value internalization is positive ($\beta = .24$, SE = .03, $p < .001$). As postulated in H2, the relationship between fan awareness and fan-team personality match is negative ($\beta = -.36$, SE = .05, $p < .001$).

Fan-team personality match (but not internalization, $p = .37$; see Table 5) relates positively with consumption of plant-based food ($\beta = .31$, SE = .08, $p < .001$). Thus, H3 is not supported, but H5 is supported. Attitude ($\beta = 0.26$, SE = .09, $p = .005$) and subjective norm ($\beta = 1.29$, SE = .10, $p = .005$), as expected in H8 and H9, relate positively to plant-based food consumption.

In support of H6 (but not H4), fan-team personality match (but not internalization; $p = .38$, CI 95% [−.020; .074]) mediates the relation between fan awareness and plant-based food consumption at medium levels of team identification ($\beta = -.11$, SE = .03, $p < .001$, CI

[2]The present study considers reported food consumption. Please note that the three consumption practices are not fully representative of sustainable food consumption. Yet, the three practices are diet-related habits that were mentioned to be most relevant to reduce the harm on the environment from the concession-stand managers' point of view, as revealed in eight semi-structured interviews with managers and vendors who run concession stands at professional football, soccer, basketball, and ice hockey games.

Table 3. Sample characteristics for participants of study 1 and 2.

Characteristics	Study 1	Study 2
Gender (male, %)	83.0	58.7
Age (18–24 years, %)	8.3	3.1
(25–34 years, %)	20.8	29.2
(35–44 years, %)	23.0	29.8
(45–54 years, %)	20.5	21.3
(55–64 years, %)	16.8	12.1
(65–74 years, %)	9.6	3.9
(75 years or more, %)	1.0	0.6
Education (Primary school, %)	2.1	2.0
(Secondary school, %)	14.1	12.1
(A-Level/IB, %)	23.9	5.1
(Bachelor/master's degree, %)	54.4	78.4
(Doctorate, %)	5.3	2.5
Personal yearly gross income (Less than $10.000, %)	8.4	0.8
($10,000–$29,999, %)	18.0	14.9
($30,000–$49,999, %)	22.6	23.9
($50,000–$69,999, %)	13.6	17.9
($70,000–$89,999, %)	10.6	20.7
($90,000 or more, %)	23.0	21.6
Household Size	$M = 2.8$ (SD = 1.3)	$M = 3.2$ (SD = 1.5)
(1, %)	12.0	14.2
(2, %)	39.2	24.8
(3, %)	18.6	14.5
(4, %)	1.8	28.5
(5 or more, %)	7.6	17.9
Dietary preferences (Omnivore, %)	75.0	56.5
(Mainly vegetarian, %)	14.4	27.8
(Mainly vegan, %)	5.3	15.2
Home games visited in the past three years	$M = 20.6$ (SD = 19.7)	$M = 10.6$ (SD = 21.7)
Duration of support of favorite team (years)	$M = 26.6$ (SD = 16.3)	$M = 18.4$ (SD = 15.2)
Main reason for becoming a fan (Multiple answers possible, %)		
(Family and friends, %)	40.6	62.1
(Team values, %)	22.7	23.6
(Success of the team, %)	13.3	37.1
(Specific player, %)	14.6	18.8
(Game-day experience, %)	20.0	15.8
Intention to change dietary preferences in the future		
(I actively try to consume a more pro-environmental diet, %)	46.7	37.6
(I never thought about changing toward a more pro-environmental diet, %)	43.8	50.0
(I do not try to consume a more pro-environmental diet, %)	9.5	12.4

M: Mean; SD: standard deviation.

95% [−0.181; −0.056]). Next, we consider the indirect relations via fan-team personality match at high and low levels of team identification. As postulated in H7b, the conditional indirect relation is weaker at high, $\beta = -.08$, SE = .03, $p = .01$, CI [−.151; −.029], compared to low levels of team identification, $\beta = -.15$, SE = .05, $p = .002$, CI [−.259; −.069]. The index of moderated mediation is .03 (CI [−.003; .090] for fan-team personality match.

In contrast to Inoue and Kent (2012a), we find no evidence for mediation via team value internalization, most likely because explained variance is picked up by fan-team personality match. The latter (but not the former) variable functions a mediator that not only explains plant-based food consumption among fans, but also differs regarding its mediation between highly and lowly identified fans. As in Inoue and Kent's (2012a) study, team identification has no association with the mediation via internalization. However, one novel finding of the present research are the differences in mediating relations between highly and lowly identified fans via fan-team personality match.

Table 4. Overview of the correlation between the variables.

Factors	1	2	3	4	5	6	7	8
1 Fan awareness of pro-environmental food initiatives	**.81 /.80**	.02	.56***	.02	.06	.45***	.62***	.49***
2 Fan-team personality match	−.29***	**.62 /.56**	.01	−.18***	.001	.18***	.19***	.25**
3 Internalization of team values	.40***	−.28***	**.76 /.73**	.11*	−.08	.42***	.52***	.44***
4 Team identification	.21***	−.14*	.36***	**.65 /.73**	.01	.08	.02	.04
5 Team mission (study 2 only)	/	/	/	/	/	−.05	.003	−.03
6 Attitude toward pro-environmental food consumption	32***	−.05	.32***	.06	/	**.81 /.80**	.56***	.48***
7 Subjective norm regarding pro-environmental food consumption	.31***	−.07	.34***	.16***	/	.41***	**.77 /.86**	.66***
8 Plant-based food consumption	.23***	.07*	.21***	−.05	/	.54***	.31***	**.71 /.70**

Square roots of average variance extracted (AVE) are shown on the diagonal (values in bold, for study 1 /2); values below (above) the diagonal represent the correlations between the constructs for study 1 (2); * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed). The square root of the AVE is greater for each construct than the correlations with the other constructs (Fornell & Larcker, 1981). Validity concerns exist for team identification (study 1) and fan-team personality match (AVE < .5; Fornell & Larcker, 1981). The composite reliability was higher than .7 for all factors (Hair et al., 2010).

Table 5. Results on how and when fan awareness of the favorite team's pro-environmental food initiatives relates to the consumption of plant-based food.

	Study 1			Study 2			Hypotheses Supported?
Direct relations on mediators	β	SE	p	β	SE	p	
Fan awareness → Team value internalization	.24	.03	<.001	.30	.09	.001	H1: Yes
Team identification → Team value internalization	.33	.04	<.001	.15	.07	.02	
Fan awareness × Team identification → Team value internalization	-.06	.04	.16	.09	.09	.33	
Attitude → Team value internalization	.15	.03	<.001	.10	.08	.20	
Subjective norm → Team value internalization	.16	.03	<.001	.20	.06	.003	
Team mission → Team value internalization	/	/	/	-.16	.07	.02	
Fan awareness → Fan-team personality match	-.36	.05	<.001	-.33	.09	<.001	H2: Yes
Team identification → Fan-team personality match	-.12	.05	.02	-.38	.10	<.001	
Fan awareness × Team identification → Fan-team personality match	.11	.06	.09	.27	.14	.05	
Attitude → Fan-team personality match	.03	.05	.49	.19	.09	.03	
Subjective norm → Fan-team personality match	.05	.05	.34	.23	.08	.003	
Team mission → Fan-team personality match	/	/	/	.05	.10	.65	
Direct relations on plant-based food consumption							
Fan awareness → Plant-based food consumption	.20	.10	.05	.24	.15	.11	
Team value internalization → Plant-based food consumption	.09	.10	.37	.26	.16	.09	H3: No
Fan-team personality match → Plant-based food consumption	.31	.08	<.001	.29	.10	.003	H5: Yes
Attitude → Plant-based food consumption	.26	.09	.005	.29	.14	.04	H8: Yes
Subjective norm → Plant-based food consumption	1.29	.10	<.001	1.10	.13	<.001	H9: Yes
Team mission → Plant-based food consumption	/	/	/	-.09	.17	.61	
Moderation of team identification on indirect relations	β		CI 95%	β		CI 95%	
Conditional indirect relation via internalization							
Low	.03		[-.025; .101]	.08		[.001; .210]	H7a: Partly (study 2 only)
Medium	.02		[-.020; .074]	/		/	H4: No for study 1
High	.02		[-.013; .063]	.10		[-.005; .238]	H7a: No
Conditional indirect relation via fan-team personality match							
Low	-.15		[-.259; -.069]	-.10		[-.220; -.030]	H7b: Yes
Medium	-.11		[-.181; -.056]	/		/	H6: Yes for study 1
High	-.08		[-.151; -.029]	-.02		[-.102; .042]	H7b: Yes
Total relations							
Fan awareness → Team value Internalization → Plant-based food consumption							
Low	.23		[.018; .420]	.32		[.015; .589]	
Medium	.22		[.006; .404]	/		/	
High	.22		[.001; .396]	.35		[.054; .613]	
Fan awareness → Fan-team personality match → Plant-based food consumption							
Low	.06		[-.145; .241]	.15		[-.175; .467]	
Medium	.09		[-.108; .275]	/		/	
High	.12		[-.089; .322]	.23		[-.090; .539]	

Notes. β: unstandardized path coefficient; SE: standard error; p: significance; CI: Confidence interval.

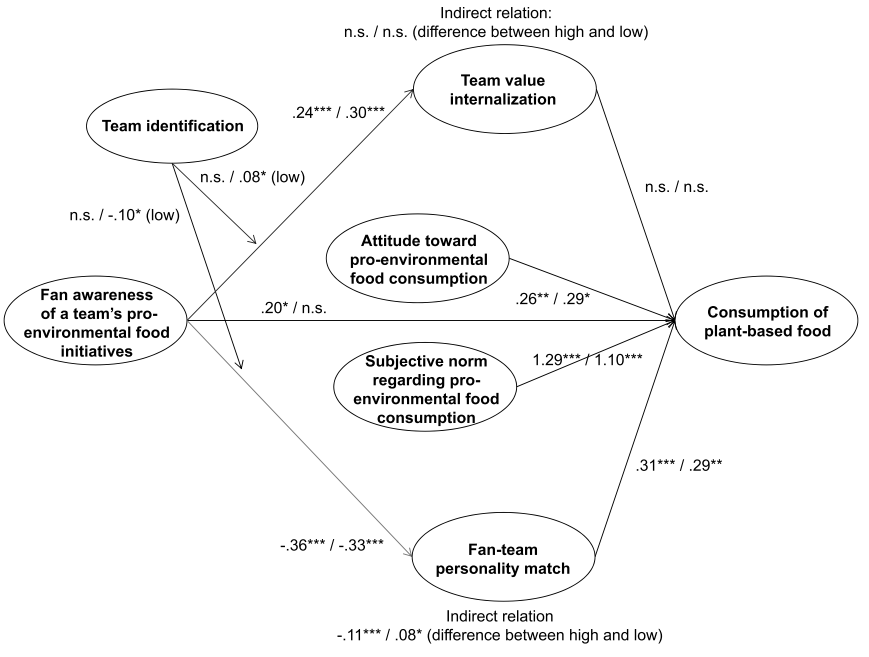

Figure 2. Model testing results for study 1 and study 2. *Notes*. Paths indicate associations between variables (no cause-and-effect relationships); * $p < .05$, ** $p < .01$, *** $p < .001$; results for study 1 (2) are shown to the left (right) of the slash.

To test the robustness of the finding, we conducted another study, in which we do not measure, but manipulate team identification. In addition, we are interested in finding out whether the negative relation for lowly identified fans via fan-team personality match will disappear when fans are reminded of the favorite team's mission to contribute to sustainable development.

Study 2

Method

Design and procedure

A survey was distributed to fans of the Boston Red Sox. The team was chosen because of the team's mission to sustainable development, and their plant-based food initiatives as part of their ongoing pro-environmental activities. A 2 (team identification: low vs. high) × 2 (mission statement: core = sustainable development vs. core = sport participation) survey-experimental design was applied. Participants were randomly assigned to one of the four experimental conditions.

Participants first read about the team's mission (either centered on sustainable development or sport participation). The instructions were as follows:

> You just indicated that you are a fan of the Boston Red Sox. Please read the mission of the team, as described in this exemplary quote: "Our mission is to make a difference by improving our fans' health, education, and recreational opportunities. Most importantly, we teach fans and younger folks about the importance of sustainability and healthy living. Fenway Park is a tool for that education, particularly to promote sustainable food consumption (quoting a high-level Fenway's manager)", or

> "Our mission is to make a difference by being an aspired baseball team. Most importantly, we teach fans and younger folks about the importance of sport and active living. Fenway Park is a tool for that education, particularly to promote sport participation (quoting a high-level Red Sox manager)".[3]

Next, they were instructed to either state events that make them feel very close to the team and indicates their identification with the team (high team identification) or state events that make them feel far away from the team and questions their identification with the team (low identification). Open-ended responses were inductively coded and the number of high-identification minus low-identification codes was used to assess whether the manipulation worked or not. Afterwards, participants completed the same survey as in study 1.

Participants

The same sample size requirements as for study 1 were applied. 356 participants took part in the study, recruited via Amazon's Mechanical Turk. They received a small compensation of US-$1.75. The data collection took place in August 2022.

Measures

The same measures were used as in study 1. Cronbach's alpha is .82 for awareness, .81 for internalization, .70 for fan-team personality match, .89 for attitude, and .91 for subjective norm.

Data analysis

We used the same procedures for the statistical analyses as in study 1 except for the addition of the mission statement manipulation (coded = 0 for sport participation and = 1 for sustainable development).

Results and discussion

To assess whether the manipulation of team identification worked, we considered the means of the difference score in identification codes (high minus low) for high- and low-identification fans. The results reveal that the manipulation is successful ($M_{\text{High identification}} = 1.43$, $SD = 1.01$ vs. $M_{\text{Low identification}} = -.79$, $SD = .99$; $t(354) = -20.87$, $p < .001$). To assess whether the manipulation of the team's mission worked, we considered differences in means for perceived focus on sustainability ($M_{\text{Sustainable development}} = 5.50$, $SD = 1.16$ vs. $M_{\text{Sport participation}} = 5.35$, $SD = 1.32$; $t(354) = 2.16$, $p = .02$) and perceived focus on sport participation ($M_{\text{Sustainable development}} = 4.75$, $SD = 1.59$ vs. $M_{\text{Sport participation}} = 5.75$, $SD = 1.00$; $t(354) = -3.85$, $p < .001$). The manipulation is successful.

The path model explains 39.2% of the variance in internalization, 11.1% of the variance in fan-team personality match, and 48.1% of the variance in plant-based food consumption. The relations between fan awareness and internalization ($\beta = .30$, $SE = .09$, $p = .001$) and fan-team personality match ($\beta = -.33$, $SE = .09$, $p = .001$), respectively, are significant and in the expected directions, supporting H1 and H2.

[3]To assess whether the manipulation worked or not, the following items were used (three items each): The Boston Red Sox' mission is to promote… sustainability, healthy eating, healthy lives (core = sustainable development); sport participation, physical activity, active lives (core = sport participation). Items were assessed on a seven-point scale (1 = Not at all, 7 = Very much).

The relation between internalization and plant-based food consumption is non-significant (β = .26, SE = .15, p = .09; not supporting H3). Fan-team personality match is positively associated with the consumption of plant-based food (β = .29, SE = .10, p = .003), supporting H5. Reminding fans of the team's mission to sustainable development does not relate significantly to plant-based food consumption (p = .61; see Table 5). Attitude (β = 0.29, SE = .14, p = .04) and subjective norm (β = 1.10, SE = .13, p < .001), as expected in H8 and H9, relate positively to plant-based food consumption.

There is no mediation via team value internalization (CI [.001; .210], p = .11, and CI [−.005; .238], p = .10, respectively). The results do not support H7a. In support of H7b, fan-team personality match mediates the relation between fan awareness and plant-based food consumption at low (β = −.10, SE = .05, p = .04, CI [−.220; −.030]), but not at high levels of team identification (p = .63, CI [−.102; .042]). The index of moderated mediation was .08 (CI [.006; .223]).

General discussion

The study's purpose was to find out whether, when, and how fan awareness of pro-environmental food initiatives of teams is associated with plant-based food consumption. The study contributes to existing research in sport management. First, our work provides novel insights into the role of *team value internalization*. Study 1 and 2 indicate that there are positive total relations with plant-based food consumption, that is, value internalization is positively related to the consumption of plant-based diets. Still, the variable does not function as a mediator of the relationship between fan awareness and plant-based food consumption and does not explain differences in responses between lowly and highly identified fans (the latter was also observed by Inoue and Kent, 2012a). Value internalization likely requires deeper engagement than the mere awareness of pro-environmental initiatives (e.g., Pape et al., 2023).

Second, the study is the first to describe the role of *fan-team personality match* in the context of sustainable consumption behaviors. Interestingly, the total relations are non-significant in both studies. There are even adverse relations between fan awareness of pro-environmental initiatives and plant-based food consumption for lowly identified fans. Ironically, the perception of the team's personality as superior to their own personality among low-identification fans is negatively related to the consumption of plant-based diets despite high awareness levels. Thus, the communication of the team's sustainability effort may run dry when lowly identified fans feel that the team's personality is "better" than their own personality in terms of relevant attributes. Highly identified fans are less prone to perceive such differences, which have downstream relations on plant-based food consumption. Thus, the trickle-down mechanism of sport teams' sustainability initiatives on pro-environmental behavioral intentions of fans found in previous studies (Casper et al., 2014, Inoue & Kent, 2012a, Trail & McCullough, 2021) may not apply to the promotion of plant-based food consumption toward lowly identified fans. One explanation might be that they are more interested in peripheral service features, such as concessions, compared to highly identified fans, who may be more interested in the core of the service experience (i.e., following the game itself and supporting the team at their best efforts; Ma & Kaplanidou, 2020). This relationship

on lowly identified fans does not disappear when they are reminded of the team's mission statement, that is, an indicator that mere communication is not enough to avoid a negative indirect backlash on the consumption of plant-based food. In reference to Casper et al.'s (2017) identification of a lowly identified but highly pro-environmental target group for an athletic department of an U.S. college, we can state that the pure focus on lowly identified fans to promote sustainable behaviors is not warranted, based on our study's findings.

Third, the study provides new insights into the applicability of the Awareness-to-Action Continuum to the promotion of pro-environmental food (Barnes, 2013). Team-initiated information provision about plant-based food may have positive downstream relations on consumption of such foods. While the present study reveals adverse associations via fan-team personality match for lowly identified fans, the positive direct associations with attitude toward pro-environmental food consumption, subjective norm, and team value internalization indicate that there are various positive associations with plant-based food consumption across fans of different identification levels. Values and attitudes are part of the Sport Sustainability Campaign Evaluation Model (Trail & McCullough, 2021) and Casper et al.'s (2014) modified Value Beliefs Norms Theory, to name but two examples of complementary theoretical bases.

Managers of sport teams can be recommended to engage fans regarding the promotion of plant-based foods, and particularly shape attitudes, subjective norms, personalities, and values (related both to the team and the fans; see also Trail & McCullough, 2021). Lea et al. (2006) identified various barriers to the consumption of plant-based diets; the need for more information about plant-based foods was the barrier that was ranked highest by participants. Plant-based food initiatives by sport teams might inform fans about the advantages of plant-based foods and reduce potential barriers. Yet, the communication should consider that lowly identified fans might feel distant from the team, in the sense that they perceive the team's personality as superior, when these fans become aware of the team's food activities. To avoid such situations, managers should engage the fans at eye level and highlight the similarities in personalities in combination with the articulation of the benefits of adopting plant-based diets.

Limitations and future research

First, we did not investigate actual behavior. Future research may conduct real-life observations of food choices in stadiums to increase external validity. Second, we did not assess multiple stages of the fan decision-making process in our study, and we did not establish causality of the full model. Future studies may test the Awareness-to-Action Continuum using a longitudinal design and testing the directionality of the full model. One question regarding our study is whether reverse causality is at play, because fans' existing eating patterns might influence whether they become aware of a team's pro-environmental food offers. To test the directionality of the model, future research might design a study, in which one team provides pro-environmental foods on-site for the first time (but another team that has a comparable fan base does not provide such foods; control group) and survey their fans over time (i.e., before and after the provision), including both vegan or vegetarian fans and fans who are neither

vegan nor vegetarian before the intervention. Then, changes over time can be observed and attributed to the provision of pro-environmental foods by the team. Third, we did not assess environmental literacy-related variables in the model. Future studies might include such measures to test Barnes' (2013) model holistically. Fourth, the scales that we used can be criticized. Fan awareness could have been measured as a binary variable (yes vs. no) in relation to concrete pro-environmental activities, or could have been measured using both implicit and explicit tools. The measurement of internalization did not allow us to assess what values were considered by fans and whether environmental values are part of the value system. For fan-team personality match, participants could score high on a performance-related measure and low on a sustainability-related measure (and vice versa), affecting the overall scores that were used in the path model. Also, the items that were used to indicate the levels of plant-based food consumption may provide a myopic view on what sustainable food consumption is. For example, while eating vegan food might be more sustainable than eating non-vegan food, the food can still be flown in for consumption (leaving a relatively high carbon footprint for transport). Fifth, using MTurk workers may have biased the results, for several reasons (e.g., extrinsic motivation for participation, lack of representativeness, tendency to fast responding, and lack of attention). Sixth, our study does not answer the question of whether the provision of plant-based food options is perceived as a threat (e.g., because eating rituals are contested). Future research may add relevant variables to the model. Lastly, while the present study is limited to the adoption of plant-based foods, the model – and possible extensions – might be applicable to other domains of sustainable consumption.

Highlights

- The study examines the relation between fan awareness of sustainable food initiatives by teams and reported plant-based food consumption
- Two empirical studies assess the mediating relation of team value internalization and fan-team personality match
- Team identification associates with the relation between awareness and food consumption via personality match (but not internalization)
- For low-identification fans, increasing personality differences have a negative indirect relation with food consumption

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Declaration of conflicting interests

There are no conflicts of interest.

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Appendix

Table A1. Overview of empirical studies on sustainable fan behavior or behavioral intentions as outcome variables

Reference	Theoretical Perspectives	Outcomes	Antecedents	Mediators Examined	Moderators Examined	Research Context	Correlational Evidence	Experimental Evidence	Main Results
McCullough and Cunningham (2011)	Theory of Planned Behavior	Intentions to recycle	Attitude, subjective norm, perceived behavioral control, specific beliefs			Attendees of youth baseball tournament (n= 129)	Yes	No	Subjective norm, but not attitude and behavioral control, as well as time and sensing pressure from other families as beliefs explain 30% of the variance in intentions
Inoue and Kent (2012a)	Social Influence Theory	Intentions to engage in daily pro-environmental behavior	Environmental practices, athlete involvement in practices, internalization	Internalization	Team identification	Student fans of a major-league team (n = 197)	No	Yes, survey-experiment	Internalization is a mediator; for team identification, no moderation was found. The final model explains 9% of the variance in intentions
Inoue and Kent (2012a)	Social marketing	Daily recycling behavior; intentions to recycle in-game	Perceived CSR, general credibility, fit, effort, impact	Environmental credibility	Issue importance	Philadelphia Eagles or Phillies fans (n = 321)	Yes	No	Environmental credibility relates positively to both outcomes; all variables except fit relate to environmental credibility. No R^2 values are reported by the authors for the full model. Environmental credibility has a weaker association with in-game recycling for fans who perceive high issue importance
Casper et al. (2014)	Value-Belief-Norm Theory	Intentions at the sport event and in daily life regarding recycling, waste diversion, and transportation	Environmental values, ascription of responsibility for sport organizations, personal norms	Ascription of responsibility, personal norms		Attendees of a college-football green game (n = 2,700)	Yes	No	Environmental values, ascription of responsibility, and personal norms explain 62% of the variance in intentions at the sport event and in daily life

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Reference	Theoretical Perspectives	Outcomes	Antecedents	Mediators Examined	Moderators Examined	Research Context	Correlational Evidence	Experimental Evidence	Main Results
Martin et al. (2015)	Community-based social marketing	Intentions and behavior regarding recycling	Informed intervention: workshop about recycling and rewards (stickers and shirts)			Tailgaters at college football events (n= 392)	No	Yes	The intervention increased reported recycling behavior (medium effect size compared to the control group; large effect size compared to baseline measurement in the experimental group).
Trail and McCullough (2018)	Internal and external constraints	Intentions regarding waste diversion	Lack of knowledge, lack of worth, lack interest from others, lack of time/access			Community run participants (n = 531)	Yes	No	Internal and external constraints explain 31% of the variance in intentions; differences in relationships between six clusters are identified
Trail and McCullough (2020)	Sport Sustainability Campaign Evaluation Model	Intentions regarding recycling, waste diversion, and buying carbon offsets	Needs, values, internal constraints, points of attachment, attitude, external constraints, past sustainable behaviors	Values, attitude		Community run participants (n = 531)	Yes	No	Attitude, external constraints, past behavior, and indirect relations explain 74% of the variance in intentions
Trail and McCullough (2021)	Sport Sustainability Campaign Evaluation Model (extension)	Waste diversion, transportation, energy conservation, and water conservation behavior	Needs, values, lack of knowledge, lack of worth, pre-attitude, pre-intention, lack of information	Values, pre-attitude, pre-intention		Caregivers of intellectually disabled athletes who attended the Paralympics (n = 182)	Yes	No	Intentions, constraints, and indirect relations predict 39% of the variance in reported behaviors during the event, which are related to satisfaction with both event organizers' communication and sustainability initiatives

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Reference	Theoretical Perspectives	Outcomes	Antecedents	Mediators Examined	Moderators Examined	Research Context	Correlational Evidence	Experimental Evidence	Main Results
Pape et al. (2023)	Internalization of values	Intention to eat a plant-based diet	Past dietary change toward vegan or vegetarian, value internalization, environmental personal norms	Value internalization		Fans of Forest Green Rovers (n = 107)	Yes	No	Internalization is a mediator. Environmental personal norms are not related to intentions. The model explains 40.7% of the variance in intentions
Present study	Awareness-to-Action Continuum	Plant-based food consumption	Awareness, fan-team personality match, team value internalization, attitude, subjective norm	Fan-team personality match, team value internalization	Team identification	Fans of 12 teams engaged in sustainable food initiatives (study 1, *n* = 799); Boston Red Sox fans (study 2, *n*= 356)	Yes (study 1)	Yes (study 2), survey-experiment	The predictors explain 32.0 and 48.1%, respectively, of plant-based food consumption. Fan-team personality match (but not value internalization) is a mediator, depending on the levels of team identification. The more the low-identification fans perceive the team's personality as superior to their own personality, the less likely they adopt a plant-based diet despite high awareness levels