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Football Fans' Interest in and Willingness-To-Pay for Sustainable Merchandise Products

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Abstract: According to the German Football League's guidelines, football clubs are expected to contribute to sustainable development. This study analyzes football fans' interest in and willingness-to-pay for socially and environmentally sustainable merchandise clothing. Data from fans of a German Football Bundesliga club were collected using an online survey in 2022 ($n = 1,019$). A set of linear, logistic, log-linear, and zero-inflated Poisson regressions was estimated. The estimations reveal that environmental concerns, environmental knowledge, past purchase of merchandise products, and awareness of sustainable labels significantly positively affect fans' interest in sustainable clothing. The probability of reporting a positive willingness-to-pay ($>€0$) is significantly positively affected by fans' interest in sustainable clothes. Team identification has a significant negative effect on the amount of willingness-to-pay for a sustainable t-shirt in the subsample of respondents with a positive willingness-to-pay.

Keywords: football; interest; merchandise; monetary valuation; sustainability; willingness-to-pay

JEL Classification: Z23; Q50; L83; D12

1 Introduction

The United Nations (UN) have developed 17 sustainable development goals (SDGs), with SDG 12 ensuring sustainable consumption and production patterns and SDG 13

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speaking to the combat of climate change and reducing its impacts (UN 2023). Following the overarching goal to improve environmental quality by simultaneously ensuring social welfare (Brumme 2022), professional football clubs and leagues have recognized the need to promote sustainable development and engage in sustainable activities. For example, a number of football clubs have signed the Sports for Climate Action Framework. Through their signature, they have agreed with the target of reducing carbon emissions and becoming more environmentally sustainable (United Nations Framework Convention on Climate Change [UNFCCC] 2022). Moreover, the German Football League (DFL) included sustainability aspects in their list of licensing criteria. This way they force Football Bundesliga clubs to report about environmental and social sustainability and increase their efforts to become more sustainable (DFL 2021).

Generally speaking, a number of areas contribute to football clubs' level of sustainability on match days, including fan travel (Loewen and Wicker 2021; Thormann, Wicker, and Braksiek 2022) as well as fan accommodation, stadium characteristics (e.g. energy usage), and food and drinks (Collins et al. 2007). In many areas such as fan travel and stadium characteristics, football clubs cannot initiate changes directly as they depend on other stakeholders. One area where football clubs are less dependent on others and have more decision making power is their merchandise products. Typically, these products are produced cheaply in Asia and shipped to Europe afterward, before they are sold across Germany or mailed again to fans around the globe.

Merchandise sales are one pillar of clubs' commercial revenues, together with sponsorship, catering, and other operational revenues. For many football clubs, these commercial revenues make up a substantial share of their overall revenues, even exceeding revenues from the sale of broadcasting rights (Deloitte 2019). Overall, the production and distribution of these products tends to be on the lower end of the social and environmental sustainability spectrum, while being relevant for the clubs' economic sustainability. The resulting question of making merchandise products more socially and environmentally sustainable is, therefore, also an economic one, as more sustainable production is typically associated with higher production costs such as local labor costs (Tey, Brindal, and Dibba 2018). One option to address this issue is that fans bear the additional costs and pay more for sustainable merchandise products of their club (McCullough and Cunningham 2011).

The present study addresses this question by examining fans' interest in and willingness-to-pay (WTP) for socially and environmentally sustainable produced merchandise products. Following the stated preferences literature, WTP can be considered an indicator for behavioral intentions (Orlowski and Wicker 2019a, 2019b). Therefore, we follow the economic definition of Jedidi and Zhang (2002) that it illustrates the reservation price that respondents are willing to pay for a sustainable

merchandise product (see Tully and Winer 2014 for further concepts). Previous studies have already examined behavioral intentions in terms of the WTP for environmental initiatives in grassroots sports clubs (Thormann and Wicker 2021), the WTP for offsetting carbon emissions at sport events (Lintumäki et al. 2023; Triantafyllidis and Kaplanidou 2018), and the intentions towards green donations of sport event participants (Triantafyllidis and Kaplanidou 2021). The WTP of fans for sustainable merchandise products has not yet been studied.

The research context is one German Football Bundesliga club (Arminia Bielefeld), who plans to offer sustainable products in its merchandise shop. With Arminia Bielefeld, this study was conducted in cooperation with a club that has not offered any sustainable merchandise products yet. Furthermore, sustainability fits Arminia Bielefeld's overall corporate social responsibility strategy as the club supported several sustainable initiatives regarding the use of solar panels or planting trees in the Teutoburg Forest (Arminia Bielefeld 2022). Before providing such offers, the club needs to get an understanding of fans' general interest in such products and their WTP for them. The focus is on two of the most-sold products, a t-shirt and a hoodie, each with the club's logo on it, which fulfill the criteria of environmental and social sustainability.

In our study, we focus on the pro-environmental consumption (PEC) intention that reflect the purposeful seeking to purchase environmentally and socially sustainable (Laroche, Bergeron, and Forleo 2001; Paul, Modi, and Patel 2016) clothes as one dimension of pro-environmental behavior (PEB). Other dimensions of PEB include transportation, recycling, and nutrition behavior (Breunig 2013; Scharfenkamp and Wicker 2024; Wicker 2018, 2019). As the fashion industry causes negative environmental impacts due to high carbon emissions, it has a vital role in the global economy as it keeps production costs and prices low "to serve the consumers with their desire for fashion at low prices" (Soyer and Dittrich 2021, 1). In order to make the consumption of fashion more sustainable, pro-environmental taking care of own clothes includes several aspects and has the largest impact on the environment (Fletcher 2008). Besides less frequent laundering, washing at low temperatures, washing fully loaded washing machines, PEC of clothes encompasses buying fewer but longer-lasting clothes from sustainable brands (Claudio 2007; Harris, Roby, and Dibb 2016). This context leads to the following three research questions: (1) which factors are associated with fans' interest in socially and environmentally sustainable produced merchandise articles?, (2) are there significant differences in respondent characteristics for low and high price products?, and (3) which factors are associated with fans' WTP for these products?

These research questions are theoretically underpinned by Blake's (1999) environmental value-action-gap and examined using data from an online survey among fans of Arminia Bielefeld. This study contributes to previous literature by

presenting empirical evidence on the correlates of PEC intentions of sustainably produced merchandise clothes. Based on the findings of linear, logistic, log-linear, and supplementary zero-inflated Poisson regressions, practical implications for sport managers are provided to overcome barriers to fans' PEC intentions and facilitate the compliance of sport clubs with sustainability initiatives.

2 Theoretical Framework and Literature Review

2.1 Value-Action Gap of Pro-Environmental Consumption

The theoretical framework of this study follows Blake's (1999) approach of an environmental value-action gap. The environmental value-action gap illustrates individuals' discrepancy between their concerns and knowledge about environmental problems and the subsequent lack of PEB or intentions of PEB. Several factors play a role here: On the positive side, environmental concerns and environmental knowledge are considered potential boosters for PEB intentions. On the negative side, the lack of PEB intentions is caused by three types of barriers: individuality, responsibility, and practicality.

2.2 Environmental Concerns and Environmental Knowledge as Contributors to PEC Intentions

Environmental concerns (EC) include individuals' awareness of environmental problems, a supportive attitude towards PEB, and a willingness to solve environmental problems (Dunlap and Jones 2002). EC were found to affect PEB intentions significantly positively (Maichum, Parichatnon, and Peng 2016). Especially for the purchase of sustainably produced clothes, Rausch and Kopplin (2021) find a significant positive effect of EC on PEC intentions. Likewise, in another study of marathon runners, EC was positively associated with runners' intentions to donate towards green initiatives (Triantafyllidis and Kaplanidou 2021). Among sport fans, women football fans were significantly more likely to eat vegetarian or vegan in everyday life than men fans. In the football stadium, women football fans were significantly more interested in the offer of vegan burgers or sausages than men irrespective of the EC level (Scharfenkamp and Wicker 2024). For international trail runners participating in a marathon in Greece, empirical evidence shows that environmental consciousness had a positive effect on WTP for voluntary carbon offsetting (Triantafyllidis and Kaplanidou 2018). Furthermore, the general attitude towards the environment and the recognition of environmental problems were positively

associated with the WTP for offsetting carbon emissions (Lintumäki et al. 2023). Based on this evidence, we derive the first hypothesis:

H1: Environmental concerns are positively associated with PEC intentions.

Another precondition of PEC intentions is environmental knowledge (EK): Individuals are knowledgeable about the environment, if they are familiar with environmental concepts and understand the functioning of ecosystems as well as the interdependencies between their own behavior and the natural environment (Fryxell and Lo 2003). EK might lead to environmental attitudes (Ko and Jin 2017; Kollmuss and Agyeman 2002) and ultimately to PEB intentions (Kollmuss and Agyeman 2002). In the context of this study, football fans are assumed to have EK if they understand the consequences of their purchasing behavior of merchandise products on the ecosystem (Goh and Balaji 2016). Research examining the effects of EK on PEC intentions yielded mixed evidence: While some research indicated that EK neither influences the attitude towards sustainable products nor the intention to purchase such products (Jaiswal and Kant 2018), the majority of previous studies confirmed that EK is an essential precondition for PEB intentions (Chan 2001; Ko and Jin 2017; Kumar, Manrai, and Manrai 2017; Maichum, Parichatnon, and Peng 2016; Mostafa 2007; Wang, Qian, and Yu 2014; Yadav and Pathak 2016). Based on these findings, we derive the second hypothesis:

H2: Environmental knowledge is positively associated with PEC intentions.

2.3 Barriers of PEC Intentions

Barriers like individuality, responsibility, or practicality might hinder individual intentions for PEC. The barrier of individuality considers cognitive structures or attitudes that hinder individuals to translate their positive environmental attitudes into PEC behavior or at least into PEC intentions (Blake 1999). Individuality in the sport fan context is reflected by past purchase behavior of merchandise products, awareness of sustainable brands, and interest in purchasing sustainable products.

Past purchase behavior is known to be connected with individual attitudes towards PEB (e.g. Thormann and Wicker 2021, 2024). While Kim and James (2016) find that past purchase behavior of merchandise products was significantly and positively associated with future intentions to consume merchandise products, there is no evidence on this link for sustainable clothes, yet. Similar findings are evident for sustainable hotels (Han and Kim 2010). Drawing from these findings, we suggest the following third hypothesis:

H3: Past purchase behavior of club's merchandise products is positively associated with PEC intentions.

A lacking awareness of the sustainable impact of clothing and sustainable labels might be another individual barrier hindering individuals to pursue PEC intentions. Previous research indicated that individuals in general had a limited awareness of the environmental impact of clothing (Goworek et al. 2012) and corresponding labels. Harris, Roby, and Dibb (2016) identified three reasons for this low level of awareness: First, clothing is not an altruistic purchase, suggesting that sustainability of clothes was evaluated very low in consumers' purchasing decision criteria. Second, the sustainability of clothes is too complex, meaning that consumers lack knowledge about mechanisms in the textile industry and e.g. the link between prices and the payment of cotton farmers. The third reason is the high diversity of ethical concerns among consumers, meaning that while some consumers might be concerned about animal welfare, some prioritize that their clothes were produced child-labor free. Due to the generally low level of awareness about the sustainable impact of clothing, the fashion industry has developed specific labels, like e.g. the green button, that reflect the extent to which items were produced in an environmentally and socially sustainable manner. Therefore, we assume that the awareness of sustainable labels might reduce the lack of knowledge about at least some mechanisms in the textile industry towards more sustainability, thus supporting PEC intentions. The resulting hypothesis is:

H4: Awareness of sustainable labels is positively associated with PEC intentions.

A particular interest in sustainably produced clothes is a necessary precondition for the purchase of these goods. Specifically, green attitudes were significantly positively related to purchase intentions of sustainable products (Jaiswal and Kant 2018). The interest in sustainable products goes beyond that of awareness of sustainable labels/products, as it includes that consumers do not only have environmental concerns, but also consider the particular ecological consequences of their purchase behavior (Jaiswal and Kant 2018). A number of studies have shown a positive link between the consumer's interest and willingness to buy sustainable products (Akehurst, Afonso, and Gonçalves 2012; Chan 2001; Dagher and Itani 2014). Therefore, interest in sustainable products might consequently boost individuals' interest in and WTP for sustainable merchandise clothes:

H5: Interest in sustainably produced clothes is positively associated with PEC intentions.

Responsibility is a second barrier that hinders individuals with environmental concerns or knowledge to pursue their pro-environmental intentions, because “they do not feel that they (as individuals) should take the responsibility for helping to solve environmental problems” (Blake 1999, 266). In the context of sport fans, the barrier of responsibility can be captured by the fans’ lacking identification or psychological link with the football team (Greenwood, Kanters, and Casper 2006). Individual commitment and a certain emotional attachment to the football club are indicative of fan identification (Branscombe and Wann 1991). In the strongest form, fans perceive themselves to be part of the football team (Wann and Branscombe 1992). It is possible that the football club’s aim to comply with sustainability initiatives might be considered a mutual goal by football fans. Therefore, a high team identification of football fans might be leveraged by the club to reach this goal (McCullough and Cunningham 2011; McCullough and Kellison 2016) as individuals categorize themselves to be part of specific groups as part of their social identity (Tajfel and Turner 1986). Regarding PEC intentions, Kwon, Galen, and Jeffrey (2007) outline the relevance of team identification for sport fans as it explains 42.6 % of the variance in purchase intentions of merchandise products. In this study, a lacking identification with the football team (Brown 1998) is assumed to be related to a low feeling of belonging and no/low perceived need to contribute to the club’s common goals (Wann and Grieve 2005). The corresponding hypothesis is:

H6: Team identification is positively associated with PEC intentions.

A third barrier is practicality, implying that sport fans lack sufficient income to translate their EC and EK into PEC intentions. Based on the low-cost hypothesis of Diekmann and Preisendörfer (2003), individuals only formulate behavioral intentions in situations where perceived costs in terms of financial costs, time, convenience, and effort are low (Wicker 2018). An example for such a successful translation is the reduction of one’s carbon footprint with a simultaneous financial cost reduction by using public transport instead of using the private and more convenient car (Becken 2004; Wicker 2019). The purchase of sustainably produced merchandise products is likely associated with higher prices because of higher costs for raw material and labor. Conversely to previous literature claiming that consumers are willing to pay a price premium for sustainable clothes (Hamilton and Zilberman 2006), Tey, Brindal, and Dibba (2018) showed that both an additional value and an appealing esthetic is necessary for sustainable clothes being purchased. Therefore, football fans with lower income are less likely to purchase sustainably produced merchandise clothes, as reflected in the last hypothesis:

H7: Income is negatively associated with PEC intentions.

3 Methods

3.1 Data Collection

Quantitative data were collected using an online survey of football fans and spectators of Arminia Bielefeld from April to June 2022. The link to the survey was provided on the club's social media platforms, in newsletters, and on the website of the collaborating university. Since the survey was anonymous, it is not possible to report the channel through which respondents were recruited. Overall, 1,021 respondents completed the survey and 1,019 answers could be used for the empirical analysis. The collected respondents' characteristics and structure were discussed with club officials of Arminia Bielefeld to ensure that the sample is comparable to the perceived fan base of the club.

3.2 Questionnaire and Variables

The survey included a number of questions measuring past purchase of merchandise products, environmental concern (Kilbourne and Pickett 2008; Paul, Modi, and Patel 2016), environmental knowledge (Ko and Jin 2017), awareness of sustainable labels (Henninger 2015), team identification (Wann and Branscombe 1993), and respondents' sociodemographic characteristics (gender, age, education, income). The employed scales have acceptable reliability, with Cronbach's alphas of 0.893 (environmental concern), 0.773 (environmental knowledge), and 0.931 (team identification). Mean indexes were computed for these three constructs (Table 2).

WTP was assessed using the contingent valuation method (Orlowski and Wicker 2019a), which is an established method and was used in previous studies assessing football fans' WTP (Frick and Wicker 2018; Wicker et al. 2016). At the heart of the survey was a CVM scenario, with respondents randomly receiving either the version with a t-shirt or a hoodie. The scenario started with informing respondents about societal expectations towards sport organizations to become more socially and environmentally sustainable and the implementation of sustainability aspects in the DFL's licensing criteria from the 2023/24 season onwards, forcing clubs' business processes to become more sustainable. Then it was assumed that given these developments, Arminia Bielefeld wants to become more socially and environmentally sustainable and that sustainably produced products will be offered in the fan store in addition to conventionally produced ones. It was supposed that respondents want to purchase a shirt/hoodie (current price €25/€60), with a socially and

environmentally sustainably produced shirt/hoodie being offered in addition to the conventional product. The sustainably produced shirt/hoodie would look similar and be of the same quality as the regular shirt/hoodie. Then respondents were asked for their level of interest in this sustainably produced shirt/hoodie on a five-point scale. This variable represents the first outcome of interest, which is PEC intentions.

The second and third measure of PEC intentions stem from the assessment of WTP. After the interest question, respondents were asked for their likelihood of purchasing the shirt/hoodie at different prices. Thus, WTP was assessed using a payment card format (Orlowski and Wicker 2019a), which was selected to reduce hypothetical bias (Whitehead and Wicker 2019). The answers were converted into a continuous variable, with respondents clicking on 5 (very likely) receiving the respective Euro value and respondents not clicking on five for any price being assigned a $WTP = €0$. Based on respondents' answers, two WTP variables were calculated, a WTP dummy and a logged WTP variable reflecting the amount of WTP of those respondents having a positive WTP (i.e. $WTP > 0$).

3.3 Empirical Analysis Strategy

The empirical analysis starts by providing descriptive statistics to give an overview of the sample structure and respondents' WTP. In a second step, statistical significant differences based on χ^2 - or t -tests between the mean values for the subsamples of respondents for either the sustainably produced t-shirt or hoodie are reported. The same comparison is conducted for the subsamples of respondents with a $WTP = 0$ and a $WTP > 0$.

Third, two sets of regression models for the subsamples of the t-shirt versus hoodie scenario were estimated. The first estimation is a linear regression model explaining the interest in a sustainably produced merchandise product. The second is a logistic regression that estimates the likelihood of respondents stating a positive WTP. The third is a log-linear regression model estimating the correlates of the logged amount of WTP of those respondents with a positive WTP. This approach to first examine the extensive margin with a logistic regression to find out which respondents have a positive WTP for sustainable clothes, followed by an analysis of the intensive margin (here: amount of WTP for those with a positive WTP, hence excluding zeros) is a common procedure for datasets including a high percentage of zeros (Humphreys, Lee, and Soebbing 2010, 2011). Therefore, this two-step approach has been frequently applied in research examining the determinants of football fans' WTP (Frick and Wicker 2018; Wicker et al. 2016).

The independent variables include environmental concern, environmental knowledge, team identification, and respondents' sociodemographic characteristics.

In the last two model specifications, the interest in a sustainable merchandise product is added as an explanatory variable. To avoid distortions due to multicollinearity, a correlation analysis for all independent variables has been conducted. As all bivariate correlations were below the critical threshold of 0.8 (Hair et al. 2013), no distortions are expected. Nevertheless, for all sets of estimations, we run separate models using environmental concerns, environmental knowledge, or awareness of sustainable labels, recognizing that these variables are not statistically highly correlated, but still conceptually related. Since heteroscedasticity is likely in large cross-sectional data, heteroscedasticity-consistent standard errors were included in each regression model. The predictive capacity of each regression model is either provided by the Pseudo- R^2 for logistic regressions or the R^2 for (log-)linear regressions.

With 43 % of respondents stating a zero WTP, the present sample is characterized by a high share of zeros, which might represent an issue in the empirical analysis. Specifically, these zeros might not only be composed of genuine zeros, but also include protest zeros (Frick and Wicker 2018). To address this issue, we provide supplementary analyses on the full sample including the zero responses and estimate zero-inflated Poisson regressions (Eisenberg et al. 2015; Lambert 1992; Muñoz, Rodríguez, and Suárez 2014; Otto, Pawlowski, and Utz 2021) – similar to previous WTP research in sport (Lintumäki et al. 2023). The predictive capacity of these models is provided by the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC).

4 Results

4.1 Descriptive Statistics

Table 1 shows the descriptive statistics of all variables. The detailed items of mean indexes like EC, EK, sustainable labels, and team identification are displayed separately in Table 2. Table 3 reports the mean values for the subsamples of respondents for either the sustainably produced t-shirt or hoodie, including the corresponding χ^2 - or *t*-tests. On average, respondents were interested in purchasing a sustainably produced merchandise product (4.07) (Table 1). Interest in the sustainable shirt is significantly higher for t-shirts with 4.16 on average compared to 3.97 for the hoodie (Table 3). The WTP for a sustainably produced t-shirt is significantly lower (€19.42) than for a hoodie (€32.28) (Table 3). Overall, 57.1 % of respondents stated a positive WTP. Average WTP of those respondents with a positive WTP is €29.86 for a sustainable shirt and significantly lower than for a sustainable hoodie (€65.50) (Table 3).

Table 1: Overview of variables and summary statistics.

Variable	Description	Obs.	Mean	SD	Min	Max
Interest	Interest in a sustainably produced merchandise article (1 = not interested at all; 5 = very interested)	1,019	4.066	0.924	1	5
WTP_Dummy	Respondent stated a positive WTP > 0 (1 = yes; 0 = no)	1,019	0.571	–	0	1
WTP_Euro	Amount of WTP (in €)	1,019	25.859	26.456	0	80
WTP_Euro> 0	Amount of WTP of those with a positive WTP > 0 (in €)	1,019	45.275	18.596	25	80
Env_concern	Environmental concern index (items see Table 2; 1 = no concern; 5 = high concern)	1,019	4.254	0.700	1	5
Env_knowledge	Environmental knowledge index (items see Table 2; 1 = no knowledge; 5 = high knowledge)	1,019	3.574	0.645	1.4	5
Sust_labels	Sustainable labels index (items see Table 2; 1 = not important; 5 = very important)	1,019	3.485	0.759	1	5
Team_id	Team identification index (items see Table 2; 1 = no identification; 5 = high identification)	1,019	4.123	1.016	1	5
Past_consumption	Respondent has purchased merchandise products of the club in the last 2 years (1 = yes; 0 = no)	1,019	0.819	–	0	1
Female	Gender of respondent (1 = female; 0 = male)	1,019	0.295	–	0	1
Age	Age of respondent (in years)	1,019	29.188	10.363	18	99
Low_education	Highest educational level is below A-levels (1 = yes; 0 = no)	1,019	0.267	–	0	1
A_levels	Highest educational level is A-levels (1 = yes; 0 = no)	1,019	0.425	–	0	1
University	Highest educational level is a university degree (1 = yes; 0 = no)	1,019	0.308	–	0	1
Income	Personal net income per month (in €)	1,019	1,664.132	1,062.273	250	4,250
Scenario_shirt	Type of scenario received (1 = t-shirt; 0 = hoodie)	1,019	0.500	–	0	1
Inseason	Respondent answered survey during the running season before or on the last match day of May 14th, 2022 (1 = yes; 0 = no)	1,019	0.921	–	0	1

Table 2: Overview of scales and included items ($n = 1,019$).

Scale (1 = totally disagree; 5 = totally agree)	Mean	SD	α
Environmental concern			0.893
I am very concerned about the environment	4.021	0.870	
Humans are abusing the environment	4.261	0.855	
I would be willing to reduce my consumption to protect the environment	4.088	0.891	
Major political change is necessary to protect the natural environment	4.400	0.863	
Major social changes are necessary to protect the natural environment	4.523	0.747	
Anti-pollution laws should be enforced more strongly	4.230	0.965	
Env_concern (index)	4.254	0.700	
Environmental knowledge			0.773
I know that I buy products and packages that are environmentally safe.	3.387	0.850	
I know more about recycling than the average person.	3.228	0.970	
I know how to select products and packages that reduce the amount of waste ending up in landfills.	3.503	0.969	
I am confident that I know how to sort my recyclables properly.	4.280	0.760	
I am very knowledgeable about environmental issues.	3.474	0.892	
Env_knowledge (index)	3.574	0.645	
Sustainable labels			0.788
I am aware of labels that signal the sustainable production of clothing.	3.571	0.962	
I am able to assign the labels according to type of sustainability and evaluate their meaningfulness.	3.126	0.990	
I consider information about environmental labels important when purchasing sustainable products.	3.375	0.967	
I will purchase sustainable merchandise products when they are certified by sustainable labels.	3.868	0.965	
Sust_labels (index)	3.485	0.759	
Team identification			0.931
When I talk about Arminia Bielefeld, I usually say 'we' instead of 'they'.	3.913	1.314	
For me, it is important that Arminia Bielefeld wins.	4.327	1.025	
I follow the media coverage of Arminia Bielefeld.	4.458	0.859	
It is very important to me to be a fan of Arminia Bielefeld.	4.213	1.186	
I display Arminia Bielefeld's name or insignia at my place of work, where I live or on my clothing.	3.871	1.281	
My friends believe that I am a passionate fan of Arminia Bielefeld.	3.959	1.332	
Team_id (index)	4.123	1.016	

With respect to the explanatory variables, respondents stated to be more environmentally concerned (4.254) than to have environmental knowledge (3.574) and to be partly interested in sustainable labels (3.485). The identification with Arminia Bielefeld among respondents is rather high with a mean of 4.123. The

Table 3: Comparison of sub-samples for t-shirt ($n = 509$) and hoodie ($n = 510$; mean values).

Variable	T-shirt	Hoodie	χ^2	t
Interest	4.159	3.973	0.005	-3.239**
WTP_Dummy	0.591	0.594		
WTP_Euro	19.420	32.284		7.997***
WTP_Euro > 0	29.864	65.598		75.332***
Env_concern	4.269	4.239	0.281	-0.683
Env_knowledge	3.592	3.556		-0.882
Sust_labels	3.500	3.471		-0.618
Team_id	0.713	0.698		
Past_consumption	0.831	0.808		
Female	0.305	0.286		
Age	29.513	28.865		-0.998
Low_education	0.267	0.267		
A_levels	0.415	0.435		
University	0.318	0.298		
Income	1,675.344	1,652.941	0.015	-0.337
Relegation	0.084	0.082		

Note: ** $p < 0.05$; *** $p < 0.01$.

majority of respondents (81.9 %) purchased merchandise products during the last 2 years (Table 1). No significant differences between respondents of the t-shirt or hoodie scenario are evident (Table 3).

Turning to sociodemographic characteristics, nearly one third of respondents are female (29.5 %). The average age is 29.2 years and average income is €1,664. Concerning educational level, 26.7 % of respondents have lower education (below A-levels), 42.5 % have A-levels, and 30.8 % a university degree. The mean values for environmental concern are 4.25, 3.57 for environmental knowledge, and 4.12 for team identification. According to the on average high team identification, 88.42 % of respondents stated to be a fan of Arminia Bielefeld. Most respondents (81.9 %) have purchased merchandise products of the club in the last 2 years. Approximately 92 % of respondents answered the survey in season until May 14th, the residual questionnaires were answered offseason until June 2022. Half of the sample received the shirt and the hoodie scenario (Table 1). No significant differences in socio-demographics between respondents of the t-shirt or hoodie scenario are evident (Table 3).

Table 4 compares the two subsamples of respondents with a $WTP = 0$ and a $WTP > 0$. The average WTP among those who stated a positive WTP for sustainable clothing is €45.28. Respondents answering that they have no WTP for a sustainable hoodie or t-shirt have a significantly lower interest in sustainable merchandising

Table 4: Comparison of sub-samples for WTP = 0 ($n = 437$) and WTP > 0 ($n = 582$); mean values.

Variable	WTP = 0	WTP > 0	χ^2	t
Interest	3.664	4.368		−12.998***
WTP_Euro	0	45.275		
Env_concern	4.095	4.373		−6.386***
Env_knowledge	3.473	3.651		−5.897***
Sust_labels	3.327	3.605		−0.618
Team_id	4.066	4.167		−1.567
Past_consumption	0.778	0.416	8.862**	
Female	0.279	0.449	0.966	
Age	29.737	28.777		1.465
Low_education	0.311	0.234	7.668**	
A_levels	0.416	0.431	0.224	
University	0.272	0.335	4.608**	
Income	1,640.16	1,682.13		−0.624
Relegation	0.080	0.086	0.015	0.111
Inseason	0.922	0.921	0.005	

Note: ** $p < 0.05$; *** $p < 0.01$.

clothes, lower EC, lower EK, higher past consumption, and a higher probability for a lower education compared to respondents with a positive WTP for sustainable merchandise clothing (Table 4). Based on these findings, it is possible that protest statements are included among those respondents with zero WTP. The finding regarding education is in line with Lübke (2022) documenting that climate change deniers are less educated.

4.2 Interest in and WTP for Sustainably Produced Merchandise Products

Table 5 displays the results of linear regressions. Regarding the interest in a sustainably produced merchandise products, the results reveal that a higher EC, higher EK, and a higher awareness of sustainable labels are significantly associated with a higher interest in a sustainable t-shirt or hoodie (models 1–6). Therefore, hypotheses H1 and H2 are supported. While a higher team identification is only weakly significant and positively associated with a higher interest in a sustainable t-shirt (model 1), there is no significant effect on the interest in a sustainable hoodie (models 2–5). However, past consumption of the club’s merchandise products is significantly positively associated with the interest in both sustainable products (models 1–6). Therefore, hypothesis H3 is supported.

Table 5: Linear regression analyses for interest in a sustainable t-shirt and hoodie.

	T-shirt			Hoodie		
	(1) Interest	(2) Interest	(3) Interest	(4) Interest	(5) Interest	(6) Interest
Env_concern	0.590*** (0.058)			0.527*** (0.059)		
Env_knowledge		0.422*** (0.057)			0.263*** (0.069)	
Sustainable labels			0.474*** (0.049)			0.418*** (0.059)
Team_id	0.140** (0.059)	0.098 (0.063)	0.062 (0.062)	−0.024 (0.061)	−0.027 (0.064)	−0.049 (0.062)
Past consumption	0.405*** (0.138)	0.348** (0.150)	0.368** (0.153)	0.336** (0.140)	0.309** (0.141)	0.251* (0.134)
Female	0.050 (0.078)	0.085 (0.087)	0.001 (0.082)	0.062 (0.080)	0.160* (0.085)	0.091 (0.084)
Age	−0.002 (0.003)	0.000 (0.003)	0.002 (0.003)	−0.006 (0.005)	−0.006 (0.005)	−0.002 (0.005)
A_levels	0.017 (0.087)	0.211** (0.095)	0.164* (0.090)	−0.108 (0.095)	−0.032 (0.102)	0.043 (0.099)
University	0.073 (0.106)	0.241** (0.114)	0.251** (0.105)	−0.065 (0.114)	0.094 (0.115)	0.122 (0.114)
ln_Income	−0.009 (0.043)	−0.046 (0.047)	−0.033 (0.045)	0.079 (0.062)	0.036 (0.063)	0.049 (0.060)
Inseason	−0.195 (0.150)	−0.138 (0.160)	−0.150 (0.154)	0.112 (0.180)	0.079 (0.181)	0.077 (0.168)
Constant	0.986** (0.408)	2.198*** (0.370)	2.103*** (0.365)	1.117** (0.458)	2.666*** (0.493)	2.090*** (0.447)
Observations	509	509	509	510	510	510
R ²	0.256	0.139	0.218	0.165	0.059	0.127
Mean VIF	1.48	1.47	1.47	1.53	1.51	1.51

Note: Robust standard errors in parentheses, ****p* < 0.01; ***p* < 0.05; **p* < 0.1.

The results of logistic regressions explaining the probability of respondents to have a WTP higher than zero are presented in Table 6. The results reveal that EC only have a significant positive effect on the likelihood that respondents have a WTP higher than zero for a sustainable t-shirt (model 1). Thus, hypothesis H1 is only partly supported. The probability for a WTP higher than zero for a sustainable hoodie is only significantly positively affected by EK (model 5). Consequently, hypothesis H2 is only partly supported. Past consumption of the club's merchandise products has a significant positive impact on the probability of a positive WTP for a sustainable t-shirt (models 1–3). The interest in sustainably produced merchandise products significantly positively affects the likelihood of a positive WTP in both subsamples

Table 6: Logistic regression analyses for the likelihood of having a positive WTP (WTP_Dummy) for a sustainable t-shirt and hoodie.

	T-shirt			Hoodie		
	(1)	(2)	(3)	(4)	(5)	(6)
Env_concern	0.058* (0.031)			0.021 (0.034)		
Env_knowledge		0.026 (0.034)			0.056* (0.032)	
Sustainable labels			0.034 (0.028)			0.030 (0.030)
Team_id	0.005 (0.029)	0.001 (0.029)	−0.001 (0.029)	0.003 (0.027)	0.001 (0.028)	0.001 (0.028)
Past consumption	0.142** (0.069)	0.131* (0.070)	0.133* (0.070)	0.045 (0.068)	0.047 (0.069)	0.041 (0.068)
Female	0.009 (0.043)	0.011 (0.043)	0.005 (0.043)	0.025 (0.046)	0.029 (0.046)	0.024 (0.046)
Age	−0.003 (0.002)	−0.003 (0.002)	−0.003 (0.002)	−0.007*** (0.002)	−0.007*** (0.002)	−0.006** (0.002)
A_levels	0.060 (0.050)	0.075 (0.050)	0.072 (0.049)	0.059 (0.051)	0.062 (0.050)	0.068 (0.050)
University	0.072 (0.058)	0.085 (0.058)	0.085 (0.058)	0.124** (0.059)	0.121** (0.058)	0.131** (0.058)
ln_Income	0.001 (0.025)	−0.002 (0.025)	−0.001 (0.025)	0.046 (0.029)	0.049* (0.029)	0.047 (0.029)
Interest	0.142*** (0.025)	0.159*** (0.023)	0.151*** (0.025)	0.209*** (0.026)	0.207*** (0.024)	0.021*** (0.025)
Inseason	−0.036 (0.072)	−0.031 (0.072)	−0.031 (0.072)	−0.091 (0.080)	−0.093 (0.081)	−0.091 (0.080)
Constant	−4.010*** (1.208)	−3.425*** (1.167)	−3.410*** (1.088)	−5.418*** (1.298)	−5.949*** (1.304)	−5.466*** (1.261)
Observations	509	509	509	510	510	510
Pseudo- R^2	0.114	0.110	0.111	0.141	0.145	0.142

Note: β -Coefficients display average marginal effects; robust standard errors in parentheses, *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

(models 1–6). Hence, hypothesis H5 is supported. For sustainable hoodies, being a university graduate and income are significantly positively related to the probability of a positive WTP. Consequently, hypothesis H7 stating a positive link between income and PEC intentions, is partly supported. Conversely, age is significantly negatively related to the probability of a positive WTP in the hoodie subsample (models 4–6).

Table 7: Log-linear regression analyses explaining the WTP for a sustainable t-shirt and hoodie for respondents with a WTP > 0 (WTP_Euro > 0).

	T-shirt			Hoodie		
	(1)	(2)	(3)	(4)	(5)	(6)
Env_concern	0.046*** (0.015)			0.020** (0.010)		
Env_knowledge		0.049*** (0.016)			0.014 (0.009)	
Sustainable labels			0.070*** (0.012)			0.011 (0.009)
Team_id	−0.028** (0.014)	−0.032** (0.014)	−0.037*** (0.014)	0.004 (0.009)	0.003 (0.009)	0.003 (0.009)
Past consumption	0.049 (0.037)	0.041 (0.037)	0.033 (0.038)	0.000 (0.022)	0.000 (0.022)	−0.000 (0.022)
Female	0.041* (0.021)	0.041** (0.021)	0.031 (0.020)	0.017 (0.012)	0.021* (0.012)	0.019 (0.012)
Age	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)
A_levels	−0.034 (0.023)	−0.021 (0.023)	−0.019 (0.022)	−0.006 (0.016)	−0.003 (0.016)	0.001 (0.016)
University	−0.028 (0.026)	−0.022 (0.026)	−0.013 (0.025)	0.024 (0.021)	0.028 (0.021)	0.032 (0.020)
ln_Income	0.014 (0.010)	0.013 (0.010)	0.015 (0.009)	0.007 (0.009)	0.007 (0.009)	0.006 (0.009)
Interest	0.032** (0.014)	0.041*** (0.013)	0.027** (0.013)	0.018** (0.008)	0.022*** (0.007)	0.021*** (0.007)
Inseason	0.037 (0.034)	0.039 (0.033)	0.034 (0.034)	−0.017 (0.023)	−0.017 (0.022)	−0.016 (0.022)
Constant	2.968*** (0.112)	2.964*** (0.109)	2.977*** (0.093)	3.943*** (0.072)	3.956*** (0.069)	3.977*** (0.078)
Observations	331	331	331	251	251	251
R ²	0.114	0.120	0.169	0.122	0.118	0.115
Mean VIF	1.46	1.41	1.43	1.70	1.65	1.67

Note: Robust standard errors in parentheses, ****p* < .01, ***p* < 0.05, **p* < 0.1.

The results of log-linear models for the subsample of respondents with a positive WTP are presented in Table 7. We find that EC are significantly positively associated with the WTP for a sustainable hoodie or t-shirt (models 1–6), so that hypothesis H1 is supported. Conversely, EK is only significantly positively related to the WTP for a sustainable t-shirt, thus partly supporting hypothesis H2 (model 2). A higher awareness of sustainable labels is significantly positively related to the amount of WTP for a sustainable t-shirt (model 3). Referring to our hypotheses, we learn that

H4 is supported. A higher interest in sustainable products is significantly positively associated with the amount of stated WTP for a sustainable hoodie or t-shirt (models 1–6). Hypothesis H5 is supported. However, team identification is significantly negatively associated with the amount of WTP for a sustainable t-shirt in this subsample (model 3), so that hypothesis H6 is not supported. As income has no significant effect on neither the interest, nor the probability for a positive WTP, nor the exact WTP, hypothesis H7 is not supported.

Table 8: Zero-inflated Poisson regression for the WTP (WTP_Euro) for a sustainable t-shirt ($n = 509$) or a sustainable hoodie ($n = 510$).

	T-shirt			Hoodie		
	(1)	(2)	(3)	(4)	(5)	(6)
Env_concern	0.050*** (0.017)			0.020** (0.010)		
Env_knowledge		0.052*** (0.017)			0.015* (0.009)	
Sustainable labels			0.071*** (0.013)			0.012 (0.009)
Team_id	−0.030** (0.015)	−0.033** (0.015)	−0.039*** (0.015)	0.005 (0.009)	0.003 (0.009)	0.003 (0.009)
Past consumption	0.051 (0.040)	0.043 (0.040)	0.034 (0.041)	−0.002 (0.022)	−0.002 (0.022)	−0.002 (0.023)
Female	0.045** (0.022)	0.044** (0.022)	0.034 (0.021)	0.018 (0.012)	0.022* (0.012)	0.019 (0.012)
Age	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)
A_levels	−0.039 (0.024)	−0.025 (0.025)	−0.022 (0.023)	−0.007 (0.016)	−0.005 (0.016)	−0.001 (0.017)
University	−0.032 (0.027)	−0.025 (0.028)	−0.017 (0.026)	0.024 (0.021)	0.028 (0.021)	0.032 (0.021)
ln_Income	0.016 (0.010)	0.015 (0.010)	0.017* (0.010)	0.007 (0.009)	0.008 (0.009)	0.007 (0.009)
Interest	0.034** (0.015)	0.043*** (0.013)	0.028** (0.013)	0.019** (0.008)	0.023*** (0.007)	0.022*** (0.007)
Inseason	0.043 (0.036)	0.047 (0.035)	0.041 (0.036)	−0.016 (0.023)	−0.016 (0.022)	−0.015 (0.022)
Constant	2.942*** (0.123)	2.942*** (0.117)	2.960*** (0.099)	3.936*** (0.074)	3.947*** (0.072)	3.967*** (0.081)
AIC	2,627.185	2,628.372	2,614.161	2,277.820	2,275.563	2,277.885
BIC	2,720.299	2,721.486	2,707.275	2,370.977	2,368.72	2,371.042

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The results of the supplementary zero-inflated Poisson regressions are presented in Table 8 for sustainable t-shirts and sustainable hoodies. Like in the main estimations, the results reveal that higher EC are significantly positively associated with the WTP of those respondents who potentially have a WTP larger than zero (models 1 & 4), thus supporting hypothesis H1. While a higher EK is only significantly related to the WTP for a sustainable hoodie in the main estimations, a higher EK is also significantly related to the potential WTP for a sustainable t-shirt (models 2 & 5), thus supporting hypothesis H2. Looking at hypothesis H3 and a potential positive link between past purchase behavior and PEC intentions, the estimations provide no supporting evidence. With respect to the awareness of sustainable labels, a significant positive correlation to the potential WTP of a sustainable t-shirt partly supports hypothesis H4 (model 3). Moreover, strong supportive evidence is found for hypothesis H5 that the interest in purchasing a merchandise t-shirt or hoodie is significantly associated with PEC intentions in all models. Like in the main estimations, there is no supportive evidence for hypothesis H6 as team identification is significantly negatively associated with potential WTP of a sustainable t-shirt. Finally, there is no robust evidence on a significant association between respondents' income and their PEC intentions, so that hypothesis H7 is not supported either.

5 Discussion

The purpose of this study was to analyze the correlates of fans' interest in and WTP for socially and environmentally sustainably produced t-shirts or hoodies of a German Football Bundesliga club. Using the environmental value-action-gap approach (Blake 1999) as theoretical underpinning, seven hypotheses were derived. The findings of regression analyses are based on survey data of fans of Arminia Bielefeld.

The representativeness of our sample cannot be checked as there is no information about the structure of the total population (here: football fans of Arminia Bielefeld or in general). Therefore, the respondents' characteristics of the present sample are compared to those of other fan surveys of Arminia Bielefeld (Scharfenkamp and Wicker 2024; Thormann and Wicker 2021, 2024; Thormann, Wicker, and Braksiek 2022), indicating a high degree of structural similarity. To further understand the extent to which our sample represents the fan base of the club, we discussed the sample composition with club officials of Arminia Bielefeld. Moreover, we compared our sample with other studies drawing on survey data of Football Bundesliga fans (Frick and Wicker 2018; Loewen and Wicker 2021; Wicker et al. 2016), showing again a similar composition in terms of socio-demographics.

Answering the first research question on the determinants of a fans' interest in a sustainable merchandise product, this study outlines that EC is a significant booster on interest. This finding is line with previous literature (Lintumäki et al. 2023; Maichum, Parichatnon, and Peng 2016; Scharfenkamp and Wicker 2024; Triantafyllidis and Kaplanidou 2018, 2021). Like previous studies indicating a positive impact of EK on PEC intentions (Chan 2001; Ko and Jin 2017; Kumar, Manrai, and Manrai 2017; Maichum, Parichatnon, and Peng 2016; Goh and Balaji 2016; Mostafa 2007; Wang, Qian, and Yu 2014; Yadav and Pathak 2016), we also find a significant positive effect on the interest in sustainable clothes. Comparing the insignificant effect of EK to the significant positive effect of EC, one may conclude that (on average) more sport fans in our sample are concerned about the environment (4.254) but less perceive themselves to have knowledge (3.574), thus indicating lacking motivation to gather information in order to find solutions regarding the EC.

In line with our theoretical assumptions on individual barriers that a lack of factors is leading to lower PEC intentions, we find empirical support that past consumption behavior and awareness of sustainable labels are significantly positively related to the interest in sustainable products. Contributing to the study of Kim and James (2016) analyzing the effect of past on current purchase behavior for non-sustainable goods, we are the first study finding a boosting effect of past purchase behavior on interest. Furthermore, our findings support the rationale of Goworek et al. (2012) and Harris, Roby, and Dibb (2016) that awareness of the sustainable impact of clothes are supportive drivers for PEC intentions. Likewise, the mere interest in sustainable clothes significantly boosts the probability for a positive WTP of football merchandise clothes, thus supporting previous evidence (Akehurst, Afonso, and Gonçalves 2012; Chan 2001; Dagher and Itani 2014).

Regarding team identification as a responsibility barrier towards PEC intentions, we only find supportive evidence for the interest in sustainable t-shirts. We interpret this finding in a way that fans who feel strongly related to the club might perceive other ways to support their club than to buy merchandise articles. Another explanation could be that those fans already bought a lot of merchandise clothes in the past. This assumption is based on the descriptive statistics that respondents of the subsample with no WTP for sustainable merchandise clothes have a higher past consumption than those with a positive WTP. These findings also indicate that not only fans with a strong team identification are potential customers of sustainable merchandise.

Looking at the practicality barrier, the sport fans' income is not significantly associated with PEC intentions to buy a sustainable product. This finding contradicts the rationale of the low-cost hypothesis (Diekmann and Preisendörfer 2003), assuming that individuals may rather translate their EC into interest for low prices of sustainability activity. The divergence of our findings might be caused by the fact that

sport fans perceive merchandise clothes as an altruistic purchase (Harris, Roby, and Dibb 2016), therefore less necessary or rather luxury, in addition to their usual wardrobe.

Answering the second research question about significant differences for low and high price products, we find that football fans have a significantly higher interest in low priced sustainable clothing such as t-shirts compared to hoodies, but a higher WTP for high priced product. Football clubs learn from these findings that it might be fruitful to offer both a low price and high price alternative of sustainable merchandise clothing as a higher income is significantly positively associated with a higher probability to have a positive WTP for a high price hoodie.

Answering the third research question on the factors associated with fans' positive WTP, this study finds a significant positive effect of the awareness of sustainable labels, but a negative effect of team identification for a sustainable t-shirt. These findings refine the answers on the first research questions in two ways. Firstly, the boosting effect of awareness of sustainable labels on PEC intentions only remains in the low price scenario and indicate a limited willingness to translate the awareness of ecological consequences of clothing into PEC intentions (Goworek et al. 2012). Secondly and challenging the assumption of McCullough and Cunningham (2011) that sport clubs can leverage the sport fans' team identification to reach sustainability goals, we find that higher team identification is a significant barrier towards PEC intentions of high priced merchandise clothing. This finding is contradictory to our assumption based on the environmental value-action gap approach by Blake (1999), assuming that a lack of team identification will lead to a lack of PEC intentions. As there is no significant impact of team identification on the interest in or the probability for having a positive WTP for a sustainable merchandise product, it indicates that sport fans with high team identification do not see their contribution to support the sport club by buying (more) expensive merchandise products.

Surprisingly, WTP of those sport fans with a positive WTP is only significantly positively affected by EC and the interest in sustainable clothes in the scenario of the more expensive hoodie. This finding is somewhat surprising as we found the interest in sustainable clothing to be significantly lower in the hoodie subsample (3.973) compared to the t-shirt subsample (4.159). Comparing the mean interest in sustainable clothes only among sport fans with a positive WTP for sustainable clothes, we find no significant difference in the mean interest in sustainable clothes between respondents of the t-shirt or hoodie scenario. Therefore, one interpretation could be that the translation of interest in sustainable clothing into PEC intentions might be a more conscious process for more expensive products like hoodies, thus not significantly affecting the WTP for low price products like t-shirts. According to Tey, Brindal, and Dibba (2018), one explanation could be that sport

fans might perceive more tangible benefits from purchasing a sustainable hoodie due to a higher price, thus a higher investment and higher contribution towards more sustainability.

6 Conclusions

The findings of this study unfold the complexity of boosters and barriers towards PEC intentions of merchandise products in football clubs. Therefore, the contributions of this study to the previous literature are threefold. Firstly, this study provides a theoretical underpinning for the boosters and barriers towards PEC intentions for merchandise clothing of football clubs. Secondly and to the best of our knowledge, this study is the first to provide initial quantitative evidence for sustainable merchandise clothing of football clubs. Thirdly, the results of our study help managers of football clubs to avoid costly sustainability initiatives that might not be effective, this study provides practical directions.

Hence, several practical implications can be derived from this study. Firstly, managers of football clubs might consider to actively address the fans' environmental concerns, awareness of sustainable labels, and past consumption (in terms of loyalty) via marketing strategies that might increase fans' WTP for a sustainable merchandise product. As team identification is significantly negatively associated with WTP (higher than zero), outlining the club's intention to become more sustainable and the need for the fans' help to do so, might be another helpful initiative to support the purchase of sustainably produced merchandise products. Furthermore, sport clubs might enforce the perception of intangible benefits from purchasing e.g. a sustainable hoodie so that sport fans perceive themselves to contribute in an important and relevant way to the club's accomplishment with sustainability goals, environment's quality, and social welfare. Furthermore and regarding bigger Bundesliga clubs and current sustainability efforts, clubs do not follow a consistent strategy. While Bayern Munich claims that fan shop bags contain turf parts from the stadium's turf waste (Allianz Arena 2024), Borussia Dortmund offers sustainable fan clothes including several certificates like the Green Button on the occasion of the stadium anniversary (Borussia Dortmund 2024). As one might expect that bigger clubs might experience a higher social pressure to conform with societal expectations, the website search does not support this notion.

This study is not without limitations. In our study, we confronted fans with the possibility to buy environmentally and socially sustainable clothes. However, the differentiation of sustainability dimension in e.g. locally produced, socially sustainable produced, or only environmentally produced clothes might have yielded different insights. Therefore, future research might analyze the separate effects, but

also combinations of sustainability aspects. The survey data of this study are based on the evaluation of football fans. Therefore, future studies might analyze the research questions for fans of other team sports. As our data are cross-sectional, no causal relationships could be analyzed. Panel data might enable future studies to analyze the determinants of fans' interest in and WTP for sustainable merchandise products over time. Another limitation of our study is that protest respondents in our subsample of those with a zero WTP cannot be clearly identified. We addressed this issue partly by additionally estimating zero-inflated Poisson regressions. However, future research with survey data on PEC intentions might implement additional questions to disentangle this subgroup of respondents. The survey data were collected during the Covid-19 pandemic, therefore the findings of post-pandemic studies might differ from these. Finally, this study focuses on PEC intentions of merchandise clothing as one form of PEB. Our results might consequently not apply to other facets of PEB in everyday life in terms of e.g. recycling or mobility.

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