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Jeroen Scheerder

Steven Vos

Marijke Taks
University of Windsor

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RUNNING HEAD: EXPENDITURES ON SPORT APPAREL

Expenditures on Sport Apparel: Creating Consumer Profiles through Interval Regression
Modelling

Jeroen Scheerder¹, Steven Vos^{1,2}, and Marijke Taks^{1,3}

¹ Katholieke Universiteit Leuven, Belgium

² Policy Research Centre for Culture, Youth & Sport, Belgium

³ University of Windsor, Canada

Author Note

Jeroen Scheerder, Research Unit of Social Kinesiology and Sport Management, Faculty of Kinesiology and Rehabilitation Sciences, Katholieke Universiteit Leuven; Steven Vos, Research Unit of Social Kinesiology and Sport Management, Faculty of Kinesiology and Rehabilitation Sciences, Katholieke Universiteit Leuven; Marijke Taks, Department of Kinesiology, University of Windsor.

Correspondence concerning this article should be addressed to Jeroen Scheerder, Research Unit of Social Kinesiology and Sport Management, Faculty of Kinesiology and Rehabilitation Sciences, Katholieke Universiteit Leuven, Tervuursevest 101, 3001 Leuven, Belgium.

E-mail: jeroen.scheerder@faber.kuleuven.be

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Abstract

Using a heterodox theoretical approach, this article presents sport consumer profiles based on socio-demographic and sport-related lifestyle characteristics. Sport apparel is operationalised as a categorical, hierarchical variable. Given the censored nature of the dependent variable, a two step Heckman-type approach with an interval regression model is used. Data were obtained from a cross-sectional sample of adults in Flanders, Belgium (N=1,355). The results indicate that the decision to spend money on sport clothing and shoes is mainly determined by sport-related lifestyle characteristics, confirming the emerging importance of lifestyle in understanding the decision to consume material goods. However, the variability in the amount of money spent on sport apparel is explained by both socio-demographic variables and sport-related lifestyle characteristics. Consequently, both socio-demographic and lifestyle variables are used in the interval regression models, which is introduced as a novel technique to create consumer profiles. These profiles assist sporting goods marketers in refining their strategies to reach specific target markets.

Keywords: interval regression modelling, lifestyle, socio-cultural background, sport apparel, sport clothing, sport consumption, sport expenditure, sport industry, sport shoes

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Modelling

The increased economic importance of the sport industry in general (e.g., Slack, 2004; Pitts & Stotlar, 2007), and the sporting goods industry in particular (e.g., Andreff & Andreff, 2009; Ohl & Taks, 2008b) have been well documented in the literature. Augmented levels of sport consumption, including increased expenditures on sporting goods and services, have stimulated this growth. Micro level analysis of sport consumption reveals that sporting goods (i.e., equipment and apparel) can be acquired by many types of consumers and for various and sometimes contradictory reasons (Ohl & Taks, 2008a). Sporting goods can play an important and often symbolic role for consumers, whether it is to play sport, improve performance, identify with a team, etc. However, sporting goods are also used outside the sporting field, showcasing certain lifestyles. Thus, the consumption of sporting goods transcends the boundaries of sport (e.g., Andreff & Andreff, 2009).

Whereas analysing determinants of active sport participation and sport spectatorship has been the subject of many previous studies (e.g., Downward, 2007; Downward & Riordan 2007; Løyland & Ringstad, 2009; Taks & Scheerder, 2006), fewer studies have focused on determinants of sport expenditures (e.g., Lera-López & Rapún-Gárate 2005, 2007; Taks, Renson, & Vanreusel, 1999; Wicker, Breuer, & Pawlowski, 2010). In addition, the latter studies mainly focused on the relationship between demographic characteristics and sport expenditures while little attention has previously been given to the impact of lifestyle characteristics on sport expenditure. Given the importance of lifestyle in the consumption of material goods (Horne, 2006), the current contribution tries to fill this gap by identifying sport consumer profiles based on both, socio-demographic and sport-related lifestyle characteristics. First, the growth of the

sport and sporting goods industry is briefly illustrated, followed by an overview of theories and empirical literature to identify relevant background variables related to sport consumption. Second, the method and model issues are put forward and the usage of interval regression models is explained to estimate the effects of the socio-demographic and sport-related lifestyle characteristics on consumer expenses in sport. Next, the results are presented and research issues and marketing implications are discussed.

Review of Literature

The Growth of the Sporting Goods Industry and Sport Consumption

The exponential growth of the sporting goods industry and the associated consumption is, among others, illustrated by Andreff and Andreff's (2009) study on global trade of sporting goods. These authors analysed the international trade of 36 different sporting goods in 41 countries which were major trade partners in these goods. They estimated that the sporting goods trade represents between 0.5% and 1.0% of global exports and imports of all traded goods. The growth of sport consumption goes hand in hand with increased expenditures on sporting goods. Figures show that the US market is responsible for 45% of the consumer purchases of sporting goods in the world, while Europe has a market share of 30% (Ohl & Taks, 2008b).

Studies assessing sport-related final expenditures through household spending also illustrate the importance of sport and sporting goods consumption (e.g., Conference Board of Canada, 2005; Gratton & Taylor, 2000; Løyland & Ringstad, 2009). Taks and Késenne (2000), for instance, revealed that Flemish families spent on average 6.8% of their household budget on sport-related goods and services (including membership and entrance fees, lessons, equipment and apparel, travel, social and other indirect expenditures). This was almost 4.7 times higher (in

real terms) compared to a previous Flemish study conducted 15 years earlier by Couder and Késenne (1990).

Lera-López and Rapún-Gárate (2005) found that sporting goods and services took up a significant proportion of household consumption spending in Spanish families, reaching up to 3%. Total household spending on sport represented 2.18% of total household spending in Canada in 2004 (Conference Board of Canada, 2005). Wicker et al. (2010) discovered that members of non-profit sport clubs in Germany spend on average €1,610/yr on their chosen sport. Consumer spending on sport typically accounts for 1.5% to 3.0% of household spending. Although the components of the household expenditure on sport slightly differ in these studies, there is a general consensus that expenditures on sporting goods such as sporting apparel (including clothing and footwear) and sporting equipment are to be considered as sport consumer spending, generating and maintaining sport-related economic activity, and thus contributing to an essential part of the sport industry.

Theories of Sport Participation and Sport Consumption

As mentioned before, analysing determinants of both, active sport participation and sport spectatorship have been the subject of many previous studies, while fewer studies have focused on the determinants of sport expenditures. The demand function for sport can be derived from classical economic demand theory indicating that the demand for sport is a function of the price of sport, the price of other goods and services (substitutes and complements), income and preferences. Downward and Riordan (2007) provided a broader perspective of different economic theories to explain sport participation, including an orthodox neoclassical perspective and a heterodox or wider social science perspective.

The neoclassical economic perspective applies the income-leisure trade-off model in the context of sport participation. This theory implies that sport and leisure are the dual of work and that work provides the income for consumption. In other words, a sport participant has to make a trade-off between time for work and time for leisure. The participants need work (= money) to pay for sport and need leisure time to participate in sport activities (Taks, Renson, & Vanreusel, 1994). Becker's theory (1965) on the allocation of time in the household production function is a prime example of a neoclassical theory used in the context of explaining the demand for sport participation and expenditures (e.g., Løyland & Ringstad, 2009; Pawlowski, Breuer, Wicker, & Poupaux, 2009; Taks et al., 1994; Wicker et al., 2010). Becker's theory stresses that consumption requires not only the input of goods but also of time, and that both have a price (shadow price). Wicker et al. (2010) expanded this theory and modified the factor time allocation into time involvement in sport (i.e., intensity of sport participation). An overview of studies (e.g., Breuer & Wicker, 2008; Downward & Riordan, 2007; Pawlowski et al., 2009; Wicker et al., 2010) that used a theoretical model based on Becker's theory with regard to sport (consumption and/or participation) is provided in Downward and Rasciute (2010).

On the other hand, heterodox theories include economic, sociological and psychological approaches. These theories explore psychological foundations of sport consumer choices, such as 'arousal', 'sensation seeking' or 'anxiety' (e.g., Csikszentmihalyi, 1975; Scitovsky, 1976) or focus on Post-Keynesian consumer analysis emphasizing that individual preferences are shaped by social values (e.g., Bourdieu, 1979; Downward, 2004). These theories suggest "that prior experience in sport activities is likely to raise participation in any specific activity, and that social interactions, or lifestyles will also affect participation along with access to income and the presence of social and economic constraints or capital" (Downward & Rasciute, 2010, p. 192).

Thus, heterodox theory warrants the inclusion of socio-demographic variables and lifestyle characteristics to explain the demand for sport.

Most of the above theories have been applied to study the demand for sport participation. Lera-López and Rapún-Gárate (2007) have indicated, however, that although the demand for sport in the form of “sport participation or frequency of participation is not a perfect proxy variable for sport goods consumption” (p. 115), the drivers of sport participation and expenditure are related. While sport consumption is generally defined as the consumption of all goods and services related to the sport industry, including consumption related to sport participation, sport spectatorship, and sport sponsorship (Shank, 2005), the current study focuses solely on the consumption of sporting goods, which can also take place outside the boundaries of sport (e.g., Andreff & Andreff, 2009). For the purpose of this study, sporting goods consumption is measured through expenditures on sport apparel (clothes and footwear), regardless of whether the apparel is being purchased and used in the context of sport or not. The consumption of material goods is often underpinned by an understanding of social classes. However, “with the emergence of the concept of lifestyle the precise relationship with social class has become less clear-cut” (Horne, 2006, p. 121). This, along with the aforementioned heterodox approach, warrants the inclusion of both social and lifestyle characteristics to analyse determinants of consumer spending on sport apparel. The next section will present a series of empirical findings to detect relevant socio-demographic and lifestyle variables related to sport expenditures that will guide the development of the model to be tested.

Empirical Literature

Socio-demographic characteristics and sport expenditures. It is acknowledged that background variables such as demographic, socio-economic and psychographic variables influence sport participation (e.g., Downward, 2007; Downward & Riordan, 2007; Lera-López & Rapún-Gárate, 2005; Scheerder, Taks, & Lagae, 2007), as well as the consumption of sporting goods (e.g., Gratton & Taylor, 2000; Lera-López & Rapún-Gárate, 2007; Ohl & Taks, 2007; Wicker et al., 2010). Løyland and Ringstad (2009) analysed the demand for sport through sport expenditures and found that the demand was price inelastic, and that income elasticity tended to decrease over time. The authors explained this finding based on Linder's disease: if the wage rate goes up, leisure becomes more expensive in terms of lost income. This is also in line with Becker's theory as mentioned above.

A divergent relationship between demographic, socio-cultural and economic determinants and sport expenses has been demonstrated (Lera-López & Rapún-Gárate, 2005, 2007). In general, men seem to spend more money on sport than women (Lamb, Asturias, Roberts & Brodie, 1992; Lera-López & Rapún-Gárate, 2005, 2007; Michon & Ohl, 1989; Taks, Renson, & Vanreusel, 1995). However, in their study on German club participants Wicker et al. (2010) found higher expenditures among women despite having lower income. Other studies indicate that within each sex, there are people who spend a lot of money on sporting goods, while others spend less based on their affinity for, and involvement with sport, thus based on their lifestyle (e.g., Ohl & Taks, 2007).

With regard to the relationship between sport expenditures and age, results of several studies are scattered (e.g., Breuer, Hallmann, Wicker & Feiler, 2010). Taks et al. (1999) found a positive, but rather weak correlation between age and expenditures on sport. In contrast, a study by Lera-López and Rapún-Gárate (2005, 2007) showed that older people spend less money on

sport compared to younger sport participants, but this negative relationship was not significant. Lamb et al. (1992) found that youngsters spend more money on sport.

People with a higher level of education are more likely to spend more money on sport (Lera-López & Rapún-Gárate, 2005), and vice versa (Andreff & Nys, 2001). Wicker et al. (2010) found the reverse, but attributed this difference due to the number of students in their sample, who had not yet reached their full educational level or ‘human capital’; or to the ‘older’ people who may not have obtained higher educational levels. According to the report of the Conference Board of Canada (Conference Board of Canada, 2005), income plays a significant role in sport spending. Their 2004 study calculated an income elasticity of 3%, meaning that participants spend about three cents on sport for every additional dollar earned. Taks et al. (1995) found income to be only of minor importance when analysing expenditures of 900 men in fifteen different sports ($r=.17$, $p<.001$). Wicker et al. (2010) found positive effects of income on sport expenditures.

A positive relationship between household size and the expenditure on sport was found by Gratton and Taylor (2000). However, Lera-López and Rapún-Gárate (2005) found no significant effect for the size of household on sport expenditures. The report of the Conference Board of Canada (Conference Board of Canada, 2005) revealed that the number of children in the household can have both a positive and a dampening effect on sport spending. Expenditures on sport reached its highest level when there were two children in the household, after which sport spending started to decline. Thus the number of children may constrain spending in sport.

Sport-related lifestyle characteristics and sport expenditures. Several studies have found a positive correlation between sport participation and expenditures on sport (Davies, 2002; Lamb

et al., 1992; Taks et al., 1999). Lera-López and Rapún-Gárate (2007) found a positive effect of sport participation on expenditures, although they did not find a significant effect for a subsample of regular practitioners. These findings were explained by the existence of relevant fixed costs in sport participation, such as membership fees. In a study by Wicker et al. (2010) on the determinants of sports club members' sport expenditures the time involvement in sport had a significant effect both on sport consumption in general and sport specific expenditures. The report of the Conference Board of Canada (Conference Board of Canada, 2005) analysed the average spending according to the type of participant. Volunteers spent the most, followed by active participants and attendees. Moreover, those who participated in sport in more than one way, also tended to be the highest spenders. Wicker et al. (2010) found that a one hour increase in weekly participation, increased sport expenditures with €263. In general, studies show that sport expenditures increase with a higher level of involvement. Moreover, sport-related variables seem to be better predictors to explain sport expenses than social background variables for adult men (Taks et al., 1999), for adult women (Taks & Suls, in press), for students in sport-related university programs (Ohl & Taks, 2007), as well as for teenagers (Taks et. al, 2007).

Based on the heterodox theoretical approach and the above empirical findings, the model to be tested will include both socio-demographic and lifestyle variables. Demographic variables, such as sex and age, as well as socio-economic variables such as education, income and/or profession, and family size are all relevant socio-demographic variables in the context of sport expenditures. Personal involvement in active and passive sport participation (i.e., playing and watching sport) are indicators of a sport-related lifestyle. Bourdieu's concepts of social capital and social interaction are captured by including variables such as sport participation of the partner and friends. Finally, the available data set also allows to including a psychological

lifestyle variable, namely attitude towards sporting goods. Based on the above literature review, it is hypothesised that sport-related lifestyle characteristics, such as being a sport active participant, having an active partner and/or friends, being interested in sport, will play a more important role in the construction of sport consumer profiles compared to classic social variables.

Method

Questionnaire

A standardised questionnaire, originally developed for university students (Ohl & Taks, 2007) was adapted for school-aged children and adult populations. The adult population is the third segment, after university students in sport programs (Ohl & Taks, 2007) and teenagers (Taks, Ohl, Mason, Esch, & Scheerder, 2007), being analysed in the framework of a series of international comparative studies on sport consumption. The questionnaire consisted of 25 questions of which 19 were closed and 6 were open-ended, totalling 175 variables. The survey was divided in three sections: (a) sporting goods (i.e., possession of, and expenditures on apparel and equipment; attitude towards sporting goods; 11 questions); (b) socio-demographic information, such as age, sex, socio-economic status, family size (7 questions); and (c) sport-related lifestyle characteristics, including participation in leisure-time sport activities (active participation, watching and reading about sport; sport participation of partner and friends; 7 questions).

Each question collected the same information from the children and their parents. The questionnaire was distributed during school hours in the spring of 2007. The school children were asked to complete the questionnaire at home together with their parent(s). The

questionnaires were collected two weeks later by the researchers. The inter- and intra-tester reliability of the coding were found to be adequate.

Measurements

Dependent variables. The dependent variables in this study are (a) the Decision to spend money on Sport Apparel (DSA), coded as a dummy variable (0=no, 1=yes), and (b) Consumer Expenditure on Sport Apparel (CESA). In contrast with other studies that often take the yearly sport expenditures into account, the respondents were asked to estimate the monetary value (i.e., the total cost) of all sport apparel (i.e., clothes and shoes) they possessed at the time of the investigation. This study focuses on the spending on sport clothes and sport shoes of adults (i.e., the parents of school-aged children). Expenditures of the children living in the household are therefore not included in the dependent variables. Expenditure on sport apparel was initially graded into seven categories, later this variable was collapsed into four categories based on statistical arguments (the distribution of the different categories): $<€100$, $€100<200$, $€200<400$, and $\geq€400$.

Independent variables. Based on the reviewed literature the set of independent variables selected for the analyses includes socio-demographic variables (sex, age, education, and family size); and sport-related lifestyle characteristics (intensity of sport participation, attitudes towards sporting goods, sport participation of partner, sport participation of friends, and watching sport on TV). Education is selected as socio-economic variable over professional status and income because these variables had a reasonable number of missings. 'Attitude towards sporting goods' consisted of five items (after a reliability analysis, one of the original six items was removed) that expressed the respondents' attitude towards having and buying sporting goods. Respondents

were asked to what extent they agreed with the five items (e.g., ‘I like to wear sport apparel’, ‘I like using sport equipment’, ‘When I buy sporting goods I always pay attention to the brand’, etc.) on a seven-point Likert scale (1 = totally disagree; 7 = totally agree). The individual scores on the five items were averaged, and subsequently the data were reduced to four categories based on statistical arguments, ranging from an ‘unfavourable’ attitude to a ‘highly favourable’ attitude. Table 1 provides an overview of the measurements of the variables included in this study.

[Insert Table 1 about here]

Data Collection and Characteristics of Respondents

The data for the present study were retrieved from a cross-sectional sample of parents of school-aged children in Flanders. Flanders is one of Belgium’s three regions with an autonomous government, parliament and administration. A representative sample of schools was selected. The sample was stratified according to: (a) school population in each Flemish province ($N=5$); (b) school population in primary versus secondary schools; (c) population in each school board (community, private, provincial and municipal); and, (d) population in each school program (primary, humanities, technical and vocational high school). In total 1,159 questionnaires were distributed in primary and secondary schools, via 6 to 18 year old children, to the parents of these children, yielding a response rate of 64.1%. 1,355 adults between 27 and 68 years of age ($M=42.20$ years, $SD=5.39$) participated in the study, 51% are females and 49% are males. Considering that the sample consists of parents of school-aged children it is not surprising that adults under 25 and over 60 years of age are underrepresented. About 30% of the respondents are

blue-collar workers, 35% are office workers and 20% are executives. With regard to the socio-professional status the respondents are representative for the Flemish population, although the proportion of blue-collar occupations is slightly lower. Further analysis indicated that the non-respondents are not systematically distributed in any particular age or sex category (Scheerder, Vos, & Taks, 2008).

Data Analysis

Heckman model. A two step Heckman-type approach is used to estimate consumer expenditure on sport apparel. Because of limited dependent variables OLS-regressions cannot be consistently estimated. This often occurs when expenditure data are used due to zero expenses. Three types of estimators or approaches are commonly used to deal with this problem: (i) the Tobit model, (ii) the Double Hurdle model, and (iii) the Heckman sample selection model or 'Heckit model' (Humphreys, Lee, & Soebbing, 2010; Jones, 2000). These approaches use different estimators to deal with the same kind of problem, although each of these approaches is considered to be appropriate for particular applications. In general, the Heckman model takes for granted that there is no actual choice of zero expenditures, whereas Tobit and Double Hurdle models assume there is. In Tobit models it is presumed that the determinants of participation and consumption have the same effects, whereas in Double Hurdle models these determinants are allowed to differ. These differences in approach have been discussed more in detail by Jones (2000) and Humphreys et al. (2010).

The dependent variable (e.g., consumer expenditure on sport apparel) in the present paper is an estimation of the monetary value of all sport apparel the respondents possess. Because of this operationalisation there is no problem of infrequently purchasing sport apparel and it can be

assumed that participation implies positive levels of purchase. People who spend money on sport apparel are assumed to possess sporting clothes and shoes. Hence, it is reasonable to apply a two step Heckman-type approach in this paper (Heckman, 1979). In previous research regarding the consumption of sports and leisure activities similar approaches were applied (e.g., Downward & Riordan, 2007; Humphreys & Ruseski, 2006; Pawlowski & Breuer, 2010).

First a Probit model is estimated on the decision to spend money on sport apparel. A predicted value of the Inverse Mill's Ratio (IMR) is obtained and included as an explanatory variable in the second step (e.g., in the interval regression model) to estimate the consumer expenditure on sport apparel (non-zero expenditures). Hence, the probabilities for the interval model are scaled up by the probability that $y > 0$.

Interval regression model. The use of an interval regression model to estimate consumer expenditure on sport apparel is obvious because the dependent variable CESA is categorical, hierarchical and censored. Moreover the threshold values are known. This is often the case with survey data where it is possible or appropriate to obtain only interval (or grouped) data (e.g., income, earnings, expenditures). Interval (or grouped) regressions are variants of the ordered probit model in which the values of the thresholds are known (Cameron & Trivedi, 2009; Jones, 2000). Other data models such as the *multinomial logistic regression* or the *ordered logit model* are not chosen because they result in a loss of information within the dependent variable. The first group of models neglects the hierarchical and ordinal nature of the variable, the latter does not take the threshold values into account (Green, 2008).

The interval (or grouped data) regression model is a special case of the censored data regression model because the range of the dependent variable is completely censored (Green,

2007). The model adjusts for the doubly censored nature of the discrete data, converting the discrete variable into a continuous variable (Stewart, 1983).

The CESA variable consists of four hierarchical categories:

$$y = 1 \quad \text{if} \quad y^* < 100\text{€}$$

$$y = 2 \quad \text{if} \quad 100\text{€} \leq y^* < 200\text{€}$$

$$y = 3 \quad \text{if} \quad 200\text{€} \leq y^* < 400\text{€}$$

$$y = 4 \quad \text{if} \quad y^* \geq 400\text{€}$$

The model is described by:

unobserved

$$y^* = \beta' x + \varepsilon, \quad \varepsilon \approx N[0, \sigma^2]$$

observed

$$y = j \quad \text{if} \quad A_{j-1} \leq y^* < A_j, \quad j = 1, \dots, J, A_0 = -\infty, A_J = +\infty$$

where y^* is a latent variable, β is the vector of coefficients associated with the independent variables, ε is the random disturbance term which follows a normal distribution, y is an observable variable and J is the number of expenditure classes. The interval regression model in this study is estimated using Stata statistical software.

Goodness of fit. Due to a lack of consistency in generally accepted goodness of fit measures with regard to the kind of model used in the present paper, a likelihood-ratio test (Kendall & Stuart, 1979) is applied to examine whether a reduced model provides the same fit as a full model. In this paper a likelihood-ratio test is used to test the difference between the full model (with predictors) and the constant only model.

Collinearity statistics. The correlation analysis (see Table 3; infra) reveals rather high significant correlations between some of the independent variables. This raises the concern that there might be a problem of collinearity. Hence, the multicollinearity among the independent variables in the regression models is tested by calculating collinearity statistics. The tolerance values are all between .75 and .96, indicating that there is no multicollinearity between the predicting variables in the multivariate model.

Results

Bivariate Statistics

From Table 1 it can be seen that 74.3% of the adults spends money on sport apparel. About 32% of this group spends less than €100. Almost one third of the respondents (35.1%) spend between €100-200, and 19% spends between €200-400. Interestingly, the figures in Table 2 show that the proportion of inactive adults (13.0%) outnumbers the share of non-consumers (8.9%), indicating the wearing and usage of sport apparel outside the context of sport. As could be expected, almost all of the sport participants spend money on sport apparel. More than half of the non-participants, however, also mention to purchase sport apparel (Table 2). Sport participants and non-participants are both wearing sport apparel during work and/or leisure time ($F=.432$; NS; data not represented in the tables).

[Insert Table 2 about here]

Table 3 gives an overview of the correlations between the dependent variables DSA and CESA on the one hand and the independent variables on the other. Spearman's rank correlations

show that education, age, sport participation of partner, intensity of sport participation, attitude towards sporting goods, and sport participation of friends are significantly correlated with the decision to spend money on sport apparel.

Sex, education, intensity of sport participation, attitude towards sporting goods, sport participation of friends, and watching sport on TV have a statistically significant correlation with expenditure on sport apparel. Men, higher educated people, intensive sport participants, people with friends who participate in sport and people who watch sport on television to a larger extent spend more money on sport apparel. Weak correlations are found for the socio-demographic variables, whereas the sport-related lifestyle variables show rather strong correlations.

[Insert Table 3 about here]

Determinants of Expenditure on Sport Apparel

Table 4 presents the results for the Probit model and the interval regression model with regard to the expenditure on sport clothing and sport shoes. Marginal effects are displayed. The decision to spend money on sport apparel is determined mainly by participation in sport, the attitude towards sporting goods, sport participation of friends, sport participation of partner, age, and education. The intensity of sport participation has a strong contribution to the decision to spend money on sport apparel. People who participate intensively in sport are more likely to have sport apparel expenditures compared to people who are less or not actively involved in sport. A highly favourable attitude towards sporting goods also triggers the urge to spend money on sport apparel. Subjects from the highest educational groups are more likely to spend money on sport apparel compared to people with a primary educational level. With regard to age,

respondents aged 50 years or older are more likely to spend money on sport clothing and sport shoes. However, it should be emphasised that people under 25 and over 60 years of age are underrepresented in our sample (cf. parents of school-aged children). A rather small effect is found for family size and no effect can be found for sex and watching sport on TV.

The interval regression results show that sex, education, attitude towards sporting goods, sport involvement of friends and watching sport on TV mainly contribute to the explanation of the amount of money spent on sport apparel. A highly favourable attitude towards sporting goods strongly increases the amount of money spend on sport apparel. Subjects from the highest educational groups are significantly more likely to spend money on sport apparel. *Ceteris paribus*, respondents with a university degree spend about €137 more on sport clothes and sport shoes compared to people with a primary education. People who participate intensively in sport are also more likely to spend more money on sport apparel compared to people with lower levels of sport participation. Intensive sport participants spend about €198 more on sport apparel compared to non-participants. Interestingly, and as opposed to the bivariate outcome, people who watch a lot of sport on TV, the so-called ‘passive sport participants’, spend significantly less money on sport apparel. Their preferences lie in other areas of the consumer spectrum.

The likelihood-ratio test suggests that the variation of the independent variables in the interval regression model provides a better fit compared to the constant only model ($L^2=277.28$ (23, $p<.0001$)). The t-values in Table 4 give an indication of the importance of the different variables in the models. It is obvious that sport participation and sport-related lifestyle characteristics such as the attitude towards sporting goods are important determinants of self-reported expenditure on sport apparel.

[Insert Table 4 about here]

Based on the results of the Probit model and the interval regression model, it is possible to make estimations about the expenditure on sport apparel. From Table 5 we learn that, for example, sport non-active men, 41-45 years old, with a primary school education, who do not have sport active partners and/or friends, who have a large family, an unfavourable attitude towards sporting goods, and who frequently watch sport on TV have a probability of 35% to spend money on sport apparel. On the other hand, intensive sport active females, aged 41-45 years with a university degree, having a sport active partner and sport active friends, living in a small family and having a highly favourable attitude towards sporting goods and who watch rarely sports on TV, have a probability of 60% to buy sport clothes and shoes. Some other consumer profiles are shown in Table 5.

[Insert Table 5 about here]

Interval regression modelling allows to estimating an actual amount spent on sport apparel for different consumer profiles (Table 6). Given that these are estimations, the amounts should not be considered as 'precise' amounts, but rather as an indication of the variation in the expenditures between different consumer profiles. For example, moderately active men, 41-45 years old with secondary school education, who do not have a sport active partner, whose friends are to a lower degree partaking in sport, who have a large family and have an unfavourable attitude towards sporting goods, spend about €145 on sport apparel. In contrast, expenditures of men between 36 and 40 years of age, with a university degree and a favourable attitude towards

sporting goods, would mount to €440. Table 6 also illustrates the example of sport active women, between 41 and 45 years of age, with a university degree, having a sport active partner to spend about €696 on sport apparel.

[Insert Table 6 about here]

Discussion

Sport expenditures take up a significant proportion of household consumption spending. Worldwide growing sport consumption goes hand in hand with increasing expenditures on sporting goods. Based on a heterodox theoretical approach this paper presented the results of an analysis on socio-demographic and sport-related lifestyle characteristics underlying consumer expenditure on sport apparel. In surveys, variables such as income and expenditures are more easily measured on an ordinal level, which is why sport expenditure was operationalised as a categorical and hierarchical variable. Given the censored nature of the dependent variable, a two step Heckman-type approach with Probit and interval regression models was used, which is more appropriate compared to multinomial logistic regressions or ordered logit models.

Our hypothesis that sport-related lifestyle characteristics, such as being a sport active participant, having an active partner and/or friends, being interested in sport, would play a more important role in the construction of sport consumer profiles compared to classic social variables, is only partially confirmed and needs to be nuanced. The results show indeed that, in the context of Flemish adults, the decision to spend money on sport clothing and sport shoes is mainly determined by sport-related lifestyle characteristics (i.e., intensity of sport participation, sport participation of partner and friends, and the attitude towards sporting goods). However, both sets

of variables socio-demographic (sex, educational level and family size) and sport-related lifestyle characteristics (one's personal and friends' level of active sport participation, attitude towards sporting goods, and a disinterest of watching sport on TV) are found to explain a significant portion of the variability in the amount of money spend on sport apparel. Thus, classical social variables still play a role, once a participant has made the decision to play sport.

The results from the interval regression model confirm previous findings that men spend more on sport (see Lamb et al., 1992; Lera-López & Rapún-Gárate, 2005, 2007; Michon & Ohl, 1989), but are in contrast with the findings from Wicker et al. (2010) who found female club members to spend more money on sports than their male counterparts. The results reveal no relationship between age and sport expenditure, which is in line with the findings from Lera-López and Rapún-Gárate (2005), but in contrast with the studies by Lera-López and Rapún-Gárate (2007) and Taks et al. (1999). The latter revealed that age had a significant effect suggesting that older people are more likely to spend more money on sport. In our results, age only appears to be significant in the Probit model, indicating that the older people in the sample (>50yrs) are more likely to decide to spend money on sport apparel, than the younger age groups. Our findings confirm that people with higher levels of education spend more money on sport apparel. These results are in line with results in previous studies (e.g., Andreff & Nys, 2001; Downward & Riordan, 2007; Lera-López & Rapún-Gárate, 2005, 2007; Wicker et al., 2010). As in Gratton and Taylor (2000) a negative significant effect was found between household size and expenditures on sporting goods. These findings, however, are not in accordance with Lera-López and Rapún-Gárate (2005, 2007) and Conference Board of Canada (2005).

Several studies have found a positive correlation between sport participation and sport expenditures (e.g., Davies, 2002; Lamb et al., 1992; Taks et al., 1999; Wicker et al., 2010). The

results of the present study confirm these findings. Although sport participation is strongly related to the decision to spend money on sport apparel, it has a much smaller effect on the amount of money spent. As indicated above, once individuals have decided to spend money on sport apparel, the role of socio-demographic variables, such as sex, education and family size, cannot be denied in explaining expenditures on sporting goods. However, in both scenarios, whether it is the decision to spend money on sport apparel, or the amount of money spent, sport-related lifestyle characteristics are important predictors. This finding clearly supports the emerging importance of lifestyle as an underpinning of the consumption of material goods (e.g., Horne, 1996; Ohl & Taks, 2007, 2008a, 2008b).

This study has some limitations. It focused for instance on self-reported expenditures on sport apparel, such as sport clothing and sport shoes. There might be a potential bias to these estimations as respondents might be likely to underestimate or overestimate the monetary value of their sport apparel. For example, Davies (2002) showed that sport spending was found to be considerably greater in consumer surveys, compared to figures available in public data sources. Furthermore, it is proven that although sporting goods take up a significant proportion of household consumption spending, sport consumption also includes subscription and admission charges, sport equipment, travel costs, instruction costs, medical and insurance costs, consumption of food and drinks, etc. These expenses may be influenced by other factors.

The representativeness of the sample is a concern, since it only included adults with school-aged children. Whereas this group of adults can be seen as an interesting target market for the sporting goods industry, the group of children, which are financially depending on their parents and consequently consuming sport apparel through the adults' budget, should also be considered in future research. Seniors is another segment that would constitute an interesting

group to study. Increasing levels of sport participation among the elderly, as well as the importance of sport as a wellness and health tool, is a growing trend which certainly induces increasing expenditures on sport apparel.

Due to the rather highly aggregated nature of the expenditure data in our study there is a risk of ecological fallacies (cf. Robinson, 1950). This fallacy takes for granted that groups are homogeneous. Although the operationalisation of the CESA variable is more narrow compared to total sport expenditures, it is not unlikely to detect different consumption patterns among subjects belonging to the same subcategory such as males or females, or among participants within a specific sport. Ohl and Taks (2007), for instance, found that there are big spenders and cheapskates on sporting goods within each sex, based on their affinity for, and involvement with sport. Thus, although the average expenditure on sporting goods for women might be lower than the average expenditure on sport goods for men, there are women who spend way more money on sporting goods than men. Analyses based on aggregated data do not reveal these subtle differences. Moreover, it is possible that respondents show different consumption patterns for different subcategories of sport apparel. For instance, women might spend more on sporting clothes and jerseys, while men for example might spend more on shoes, but less on clothing. Findings at the aggregate level (i.e., sport apparel) do not show these differences that can be of importance for both, the sports clothing industry and the sports shoes industry.

Future research should also take into account sport preferences when analysing sport expenditures, since expenses on sport apparel vary with sport preference (e.g., Taks et al., 1999; Taks & Késenne, 2000; Wicker et al., 2010). For instance, Andreff (1989) made a distinction between more expensive high unit value sporting goods and cheaper sporting goods with lower value-added. The former consisted of sporting goods related to equipment used for intensive

sports practices, such as alpine skiing, sailing, windsurfing and golf, whereas sportswear related to sports like athletics, body building, gymnastics, swimming, team sports and walking are examples of the latter. In addition, Andreff (1989) emphasised that sportswear used during leisure time, outside the context of sport, also belongs to the cheaper category. Wicker et al. (2010) identified diving, equestrian sport, golf and sailing as very cost-intensive sports, mainly due to the need of expensive equipment. In a comparative analysis of the cost of fifteen sports, Taks et al. (1995) found golf to be the most expensive sport, followed by windsurfing. Hence, it would be reasonable to expect that expenses on sport apparel vary with sport preference. Therefore, it would be interesting in further research to relate expenditures on sport to specific sport preferences.

Finally, the results are based on a Flemish sample. It would be noteworthy to replicate the study in different countries, since sport cultures, and consequently the consumption of sporting goods, may vary from one region to another. For example, sport is hyper-developed in the United States where it is strongly embedded in daily life, albeit from a spectator sport perspective mainly (Westerbeek & Smith, 2003). Therefore, different determinants than the ones appearing in the Flemish study, may affect the consumption of sporting goods in the United States.

Conclusion

From a theoretical perspective, the present study supports the usage of heterodox economic theory in this type of analysis as suggested by Downward (2007) and Downward and Riordan (2007). Psychological (attitude towards sporting goods), Post-Keynesian (i.e., social relations in the form of sport participation of partner and friends), and social variables (sex, educational level, size of household) as well as sport-related lifestyle variables (involvement in

sport participation and spectating) are – to some extent – all relevant in explaining sport apparel consumption. It must be noted, however, that the data set did not allow to incorporating a neoclassical approach, since information on income and working hours were not included in the data set. Income-leisure trade-off could therefore not be measured, nor was there any information on domestic activity.

From a practical perspective, this study has several implications for sport marketers. Active involvement in (recreational) sport is rapidly growing among adults, especially among women and older adults (e.g., Scheerder, Vanreusel, & Taks, 2005; Scheerder & Vos, 2010). As a consequence, it is expected that these demographic segments have increased their interest in sporting goods. Sport is no longer seen as a mere ‘youth activity’. The sporting goods manufacturers need to be aware of this shift in participation because these particular groups allow them to increase their market share. Given the purchasing power of adults, they become an interesting target market for the sporting goods industry. Moreover, their (attitude towards) sport consumption obviously is related to the expenditures on sport apparel by their children, because children financially depend on their parents and consequently spend money on active sport participation through the household budget. New segments of sport participants and sport consumers appear, such as women, youngsters, the elderly, etc. These segments open new markets and require tailored marketing approaches.

The findings in this study provide a marketing tool to segment sport markets. Knowing determinants of the demand for sport participation and associated consumer profiles is an important asset for sporting goods manufacturers, since it helps them to effectively target particular market segments. Based on the results of the Probit model and the interval regression model, it is possible to estimate the probability to buy sporting goods, as well as to estimate the

amount of money spent on sport apparel for different consumer profiles. Segmentation based on sport-related lifestyle characteristics seems to be more effective. Although sport expenditures do increase with a higher level of sport involvement, inactive adults also seem to be purchasing sporting goods. This confirms the idea that sporting goods are multi-functional and can be bought and used for several reasons, such as to actively participate in sport, to watch sport, to be worn in settings outside sport activities, etc. (Andreff & Andreff, 2009; Taks et al., 2007). Hence, marketing strategies to increase expenditures on sport apparel are not necessarily in line with strategies to increase sport participation and vice versa. Sporting goods manufacturers need to retrieve information about consumers' characteristics through relationship marketing, consumer relationship management, and the practice of database management (e.g., Solomon, Zaichkowsky, & Polegato, 2008).

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Table 1

Overview and measurements of the variables and descriptive statistics

Variable	Description and measurement	Mean	Std.
Decision to spend money on Sport Apparel (DSA)	No (25.7%), yes (74.3%) (range 0-1)	0.74	0.44
Self-reported Consumer Expenditure on Sport Apparel (CESA)	Estimation of consumer expenditure on sport apparel in intervals (non-zero expenditures): <€100 (32.2%), €100<€200 (35.1%), €200<€400 (19.1%), and ≥€400 (13.5%) (range 1-4)	2.14	1.02
Sex	Male (48.9%), female (51.1%) (range 0-1)	0.51	0.50
Age	Age in years	42.20	5.39
Age (classes)	Age (classes): under 35 years (9.0%), between 36-40 years (30.2%), between 40-45 years (35.7%), between 46-50 years (18.1%), over 50 years (7.0%) (range 1-5)	2.84	1.05
Education	Level of education: primary (5.9%), secondary (39.1%), three year degree (28.5%), four/five year degree (12.2), university (14.3) (range 1-5)	2.90	1.15
Family size	Number of members in household in intervals: ≤ 3, 4, 5, ≥ 6 (range 1-4)	2.25	0.90
Sport participation partner	Sport participation behaviour of partner: no partner who participates in sport (27.7%), partner who participates in sport (72.3%) (range 0-1)	0.72	0.45
Intensity of sport participation	Average intensity of participation in sport: no participation (14.0%), moderate participation (54.9%), medium participation (14.4%), intensive participation (9.0%), and irregular participation (7.7%) (range 1-5)	2.42	1.08
Attitude towards sporting goods	Attitude towards having and buying sporting goods: unfavourable (29.6%), less favourable (44.5%), favourable (20.2%), highly favourable (5.7%) (range 1-4)	2.02	0.85
Sport participation friends	Sport participation behaviour of friends: low (47.5%), high (52.5%) (range 0-1)	0.53	0.50
Watching sport on TV	Frequency of watching sport on television: low (40.4%), high (59.6%) (range 0-1)	0.60	0.49

Table 2

Sport consumption among participants and non-participants

	Non-participant	Participant	Total
Non-consumer	61 (5.9%)	31 (3.0%)	92 (8.9%)
Consumer	73 (7.1%)	868 (84.0%)	941 (91.1%)
Total	134 (13.0%)	899 (87.0%)	1,033

 $\chi^2 (1; N=1,033) = 254, p < .001$

Table 3

Correlations between the dependent and independent variables (Spearman's Rank Correlations)

	1	2	3	4	5	6	7	8	9	10	11
1. DSA	1										
2. CESA		1									
3. Sex	-.018	-.230**	1								
4. Education	0.162**	.086*	.052	1							
5. Age (classes)	.062*	-.064	-.169**	.051	1						
6. Family size	.000	-.056	-.030	.170**	.037	1					
7. Sport participation partner	.305**	.062	.000	.136**	.057	.111**	1				
8. Intensity of sport participation	.412**	.277**	-.130**	.028	.044	-.007	.241**	1			
9. Attitude towards sporting goods	.217**	.397**	-.163**	-.020	-.170**	-.072*	.070*	.209**	1		
10. Sport participation friends	.277**	.255**	-.130**	.082**	-.049	.010	.112**	.178**	.291**	1	
11. Watching sport on TV	.004	.106**	-.339**	-.126**	.079*	-.068**	-.009	.096**	.224**	.147**	1

Note. * = Correlation is significant at the 0.05 level (2-tailed); ** = Correlation is significant at the 0.01 level (2-tailed)

Table 4

Probit on the decision to spend money on sport apparel (DSA) and interval regression models of self-reported consumer expenditure on sport apparel (CESA), marginal effects

Variable	Probit Model		Interval Regression Model	
	Estimate	t-value	Estimate	t-value
Sex				
<i>Male (ref.)</i>				
<i>Female</i>	.04	1.40	-47.33***	-3.48
Age				
<i>≤ 35 years</i>	-.34**	-3.06	4.42	.11
<i>36-40 years</i>	-.25**	-3.03	7.21	.23
<i>41-45 years</i>	-.19**	-2.63	8.75	.31
<i>46-50 years</i>	-.22*	-2.38	-11.10	-.36
<i>> 50 years (ref.)</i>				
Educational level				
<i>Primary (ref.)</i>				
<i>Secondary</i>	.02	.46	51.86	1.69
<i>Higher (3 year degree)</i>	.07	1.55	66.18*	2.06
<i>Higher (4-5 year degree)</i>	.12***	3.59	59.69	1.65
<i>Higher (university level)</i>	.10**	2.58	136.71***	3.90
Family size				
<i>≤ 3 members (ref.)</i>				
<i>4 members</i>	-.02	-.48	5.46	.33
<i>5 members</i>	.02	.48	-14.58	-.82
<i>≥ 6 members</i>	-.19**	-2.73	-68.25*	-2.22
Sport participation partner				
<i>No (ref.)</i>				
<i>Yes</i>	.13***	3.99	33.88	1.65
Intensity of sport participation				
<i>None (ref.)</i>				
<i>Moderate</i>	.35***	7.82	36.25	.52
<i>Medium</i>	.23***	11.32	105.76	1.37
<i>Intensive</i>	.20***	11.60	197.82*	2.40
<i>Irregular (seasonal only)</i>	.17***	9.77	68.80	.96
Attitude towards sporting goods				
<i>Low (ref.)</i>				

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<i>Moderate low</i>	.09**	3.21	83.35***	4.28
<i>Moderate high</i>	.11***	4.07	143.07***	5.93
<i>High</i>	.15***	6.57	197.06***	5.34
Sport participation friends				
<i>Low (ref.)</i>				
<i>High</i>	.15***	5.65	52.87**	2.62
Watching sport on TV (frequency)				
<i>Low (ref.)</i>				
<i>High</i>	-.03	-1.28	-33.29*	-2.37
Inverse Mills Ratio			45.05	.57
Proportion of Correct Predictions	.84			
McFadden Pseudo R ²	.31			
Likelihood Ratio Test (DF)	340.61 (22, $p < .0001$)		277.28 (23 $p < .0001$)	
Number of observations	1103		793	

Note. *= $p < .05$; **= $p < .01$; ***= $p < .001$

Table 5

Probability of expenditures on sport apparel for different consumer profiles

Sex	Age	Education			Family Size	Level of Sport	Sport Partner	Attitude towards Sporting Goods	Sport Friends	Sport on TV	Probability of Expenditure on Sport Apparel
		Primary	Secondary	University							
Male	41-45	yes	no	no	large	none	no	unfavourable	low	high	0.35
Male	<35	no	yes	no	large	moderate	no	unfavourable	low	low	0.41
Male	<35	no	yes	no	large	moderate	no	unfavourable	low	low	0.41
Female	46-50	no	no	yes	small	medium	no	unfavourable	low	low	0.49
Male	36-40	no	no	yes	small	moderate	no	favourable	low	low	0.53
Female	41-45	no	no	yes	small	intensive	no	less favourable	low	low	0.51
Male	41-45	no	no	yes	small	intensive	yes	favourable	low	low	0.54
Female	41-45	no	no	yes	small	intensive	yes	highly favourable	high	low	0.60

Table 6

Expenditures on sport apparel for different consumer profiles

Sex	Age	Education			Family Size	Level of Sport	Sport Partner	Attitude towards Sporting Goods	Sport Friends	Sport on TV	Expenditure on Sport Apparel
		Primary	Secondary	University							
Male	41-45	yes	no	no	large	none	no	unfavourable	low	high	€23.88
Male	41-45	no	yes	no	large	moderate	no	unfavourable	low	low	€145.27
Male	<35	no	yes	no	large	moderate	no	unfavourable	low	low	€141.00
Female	46-50	no	no	yes	small	medium	no	unfavourable	low	low	€300.80
Male	36-40	no	no	yes	small	moderate	no	favourable	low	low	€440.02
Female	41-45	no	no	yes	small	intensive	no	less favourable	low	low	€496.05
Male	41-45	no	no	yes	small	intensive	yes	favourable	low	low	€636.89
Female	41-45	no	no	yes	small	intensive	yes	highly favourable	high	low	€696.36