The value of Olympic success and the intangible effects of sport events – a contingent valuation approach in Germany

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Olympic Games produce tangible and intangible effects that have been extensively researched; however, little is known on the importance of Olympic success to the population. The purpose of this study was to investigate the value of Olympic success using the contingent valuation method (CVM). The empirical evaluation is undertaken with data from a nationwide population survey in Germany ($n = 2006$). Residents were asked to state their willingness-to-pay (WTP) for Germany being ranked first in the medal table and for a German winning a gold medal in track and field at the 2012 London Olympics. Average WTP amounts to €6.13 and €5.21, respectively. The regression results show that consumption capital and intangible factors were significant determinants of WTP. The findings can be integrated into cost-benefit analyses that are carried out for major sport events and can help justifying the use of taxpayer money to finance major sport events and elite sport development.

Keywords: contingent valuation method; willingness-to-pay; sporting success; public good; intangible effects

Introduction

The Olympic Games are one of the biggest sporting events worldwide; however, hosting the Olympics can be very cost-intensive as investments in sport facilities and transport facilities have to be made (Atkinson, Mourato, Szymanski, & Ozdemiroglu, 2008). Opponents of the Olympic Games argue with the immense expenses and opportunity costs of such an event and that the tax-payer has to defray a large part of those costs (Atkinson et al., 2008; Mangan, 2008). In order to justify the large public subsidies required to host such events, policy-makers have tended to argue that significant tangible and intangible benefits would arise from hosting these events (Kaplanidou & Karadakis, 2010). With regard to tangible effects, a country could increase its standard of living and gross domestic product with well organised Olympic Games (Jinxia & Mangan, 2008; Kissoudi, 2008) and the Olympics can contribute to the economic growth and employment of a region or a city through event-related consumption (Atkinson et al., 2008; Barget & Gouguet, 2007; Jinxia & Mangan, 2008; Kaplanidou & Karadakis, 2010). All of these factors can lead to a higher quality of life

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for the citizens (Barget & Gouguet, 2007). The tangible effects of hosting the Olympic Games have been well researched up to now (e.g. Preuss, 2004, 2005). However, scholars have emphasised that it is important to move beyond economic impact (Walker & Mondello, 2007) and to focus on long-term effects (Toohey, 2008) when investigating the impact of sport events.

A different approach for justifying public subsidies is to argue using intangible effects of major sport events such as the Olympic Games or Football World Cups (e.g. Maennig & Porsche, 2008). Several researchers have shown that a significant feel-good factor was associated with hosting major football events (Allmers & Maennig, 2009; Kavetsos & Szymanski, 2010). Other intangible effects relate to an increasing image of the host country, feelings of national pride and improved development of the elite sport system (e.g. Atkinson et al., 2008; Barget & Gouguet, 2007; Jinxia & Mangan, 2008). For example, hosting the Olympics can go hand in hand with the opportunity to create a positive image and make a region more attractive for tourists and visitors afterwards (Barget & Gouguet, 2007; Kaplanidou & Karadakis, 2010).

Intangible effects can not only evolve from hosting the Olympic Games, but also through the sporting success of national athletes competing at the event. Sporting success can also create public goods such as feelings of national pride (Allison & Monnington, 2002; Johnson, 2008), local unity (Castellanos, García, & Sánchez, 2011) and a feel-good factor among the population (Forrest & Simmons, 2003). As public goods are characterised by non-excludability and non-rivalry in consumption (Downward, Dawson, & Dejonghe, 2009), every citizen can benefit from national sporting success and for example talk about successful athletes. Sporting success can make people happier and can influence the perception of their own economic situation and the economic situation of the country (Dohmen, Falk, Huffman, & Sunde, 2006). Previous research has emphasised the importance of sporting success indicating that 'there has been an increasing awareness among governments of the value of elite sporting success' (Green & Houlihan, 2005, p. 1). However, it is difficult to measure the value of Olympic success due to its intangible nature.

Therefore, the purpose of this study was to estimate the value of Olympic success to the population using the contingent valuation method (CVM). The empirical evaluation is undertaken using data from a nationwide survey of the resident population in Germany ($n = 2006$). Citizens have been asked to state their willingness-to-pay (WTP) for Olympic success at the 2012 London Olympics where WTP for two scenarios was assessed. Firstly, Germany being ranked first in the final medal table and secondly, winning a gold medal in track and field, a prestigious sport where Germany has not won a gold medal since the 2000 Sydney Olympics. The study has two main research questions: (1) what is the WTP for being ranked first in the medal table and for winning a gold medal in track and field? and (2) which factors determine the WTP for being ranked first in the medal table and for winning a gold medal in track and field? The findings of the current study contribute to the body of research on CVM studies in a sporting context and to the value of national sporting success. The study has implications for policy-makers as it helps with justifying governmental expenses, and using taxpayers' money for elite sport development programmes and the hosting of major sporting events.

Literature review

Contingent valuation method

The CVM is a non-market valuation method, meaning that monetary values are placed on goods and services that are not traded in the marketplace, that is, public goods. CVM uses surveys to elicit an individual's WTP for certain hypothetical changes in non-market goods, example, to acquire or avoid a certain event taking place (Coates & Humphreys, 2003). CVM can be described as a preference approach to measure the value of changes in the allocation of non-market goods. Individuals are asked to state their WTP for certain non-market goods either by using an open question that allows choosing any monetary value or in a dichotomous choice format where certain choices of values are provided. The term *contingent* refers to the fact that respondents are asked to state their WTP that is contingent on specified hypothetical scenarios (Walker & Mondello, 2007).

Nevertheless, it becomes evident that CVM is a method which is controversial among researchers with the main criticism relating to the fact that there could be a hypothetical bias (Walker & Mondello, 2007). In a case of a hypothetical bias, respondents would overestimate their WTP. This means that their stated WTP would be higher than their actual WTP, that is, they would not be willing to pay the amount of money they stated in answer to the WTP question. Although several researchers have raised concerns about CVM from a theoretical perspective, empirical studies reported that the WTP estimates from CVM studies would be more realistic than those of other methods such as conjoint analysis and auctions (Sattler & Nitschke, 2003). With regard to a hypothetical bias, previous CVM studies showed contrary results: some studies supported a hypothetical bias as they documented respondents' hypothetical WTP exceeded their actual WTP (e.g. Johannesson, Liljas, & Johansson, 1998; Kealy, Dovidio, & Rockel, 1988; Seip & Strand, 1992), whereas no significant differences between hypothetical and actual WTP were found in other studies (e.g. Carlsson & Martinsson, 2001; Sattler & Nitschke, 2003). The issue of hypothetical bias was addressed in some studies by adjusting the results or using ex ante and ex post techniques (Johnson, Whitehead, Mason, & Walker, 2007; List, 2001; Whitehead & Cherry, 2007). The possibility of a hypothetical bias shows that the results of CVM studies have to be interpreted with caution.

Despite these methodological issues, CVM has been extensively applied in previous research to estimate the value of different types of non-market goods and public goods (for an overview see Walker & Mondello, 2007). For example, CVM has been used in the context of different environmental and recreational settings (Sanz, Herrero, & Bedate, 2003; Seip & Strand, 1992) and to estimate the value of cultural resources (for an overview see Noonan, 2003). This method has been already applied to estimate the value of sporting success (e.g. Humphreys, Johnson, Mason, & Whitehead, 2011; Rätzel & Weimann, 2006; Wicker, Prinz, & von Hanau, 2012) and for the aforementioned reasons, CVM can be regarded as the appropriate method in the current study to estimate the value of Olympic success.

Application of CVM in sports

During recent years, CVM has been increasingly applied in a sporting context (e.g. Castellanos et al., 2011; for an overview see Johnson, 2008; Johnson, Groothuis,

& Whitehead, 2001). The first to apply the CVM approach to sports were Johnson and Whitehead (2000) who aimed at determining the value of public goods generated by a new arena for the basketball team of the University of Kentucky and a baseball stadium in Lexington, Kentucky attempting to attract a minor league team. Further studies on professional team sports have been conducted that assessed the WTP for having a professional sport franchise in town or for constructing a new stadium to attract a professional sport franchise (Castellanos et al., 2011; Johnson et al., 2001; Johnson, Mondello, & Whitehead, 2007; Owen, 2006). The results of these CVM studies showed that neither project produced large enough positive benefits to justify the public funding for sport franchises. The findings also revealed that the use value (i.e. attending games of the sport team) was lower than the non-use value (i.e. talking about the team; e.g. Castellanos et al., 2011; Johnson et al., 2001).

Contingent valuation method has also been applied to assess the WTP for amateur sport programmes (Johnson, Whitehead et al., 2007). In a Canadian study, the households' WTP for enhancements in sport and recreation programmes in the province of Alberta was investigated. The results showed that the annual WTP for small programme enhancements amounted to $18 per household, exceeding the estimated WTP of households in the US with regard to paying to avoid a loss of a major league sports team (Johnson, Whitehead et al., 2007). The study of Wicker (2011) supported the finding that the WTP in amateur sports clubs was higher than the WTP for sports teams. Johnson (2008) suggested that WTP might have been higher for amateur sports programmes as more people were involved in active sport consumption than in passive sport consumption and that the higher level of involvement had an influence on stated WTP.

Finally, CVM has been used to estimate the value of hosting major sport events and has emphasised the importance of intangible effects (Dwyer, Mellor, Mistilis, & Mules, 2000). In a recent study, citizens from London, Manchester and Glasgow were asked for their WTP for hosting the 2012 Olympics in London, based on possible intangible benefits that this event might offer. The results showed that residents in London would be willing to pay £22 on average, residents in Manchester £12 and residents in Glasgow £11. The authors suggested that intangible benefits could be used to justify hosting major sporting events on the basis of a cost–benefit analysis (Atkinson et al., 2008). These findings can be supported by another study documenting that the 2012 London Olympics would also create positive intangible effects for residents outside of London and that these residents seem to be willing to pay towards the cost of the event (Walton, Longo, & Dawson, 2008). CVM studies in other national contexts also supported the importance of intangible effects that are created by major sport events (e.g. Barget & Gouguet, 2007; Süssmuth, Heyne, & Maennig, 2010).

Estimating the value of sporting success using CVM

In recent studies, CVM has been applied to estimate the value of national sporting success in the context of the Olympic Games (Humphreys et al., 2011) and the Football World Cup (Rätzel & Weimann, 2006). With regard to the 2006 Football World Cup, the CVM estimates from a German study showed that residents were willing to pay €10.78 on average for a final with German participation and showed that the success of the German national football team produced a feel-good factor.

The researchers also explored the willingness-to-accept (WTA) a final loss by the German team, that is, the compensation required for an individual if Germany did not win. The average WTA amounted to €225 on average indicating the substantial value of national sporting success to the population (Rätzel & Weimann, 2006; Wicker et al., 2012). In a study on the 2010 Football World Cup, the Germans' WTP for winning the title amounted to €26 on average indicating that national sporting success has a certain (economic) value to the population (Wicker et al., 2012).

A Canadian study conducted in the context of the 2010 Winter Olympic Games in Vancouver indicated that Olympic medal success was important to the Canadian population. Humphreys et al. (2011) assessed the Canadians' WTP for the *Own the Podium* programme, a specific programme designed to increase the performance of Canadian athletes in the 2010 Vancouver Olympics. Before the event, Canadian households were willing to pay on average $54 for this programme; however, this figure rose substantially after the (successful) Olympic Games where households stated an average WTP of $98. The aggregated and discounted values of WTP (before and after the Games) indicated that this was one of the first occasions where the residents' WTP exceeded the costs of the programme (Humphreys et al., 2011). The findings revealed that sporting success had a higher value to the population than having a professional sport franchise in town and the WTP values even exceeded those from studies on active sport consumption (Johnson, White-head et al., 2007). However, it would be interesting to see whether similar effects can be found for non-host countries and for the Summer Olympic Games. The literature review has shown that the value of Olympic success has been largely neglected in previous research with only a few exceptions, indicating that further research is needed in this field.

Theoretical framework

It is suggested that several factors have an influence on the value of sporting success, which can be divided into consumption capital factors, intangible factors and socio-economic factors. First, it can be assumed that an individual's consumption capital is important to the value of sporting success (Wicker et al., 2012). Generally speaking, individuals can generate so-called consumption capital through the repetitive consumption of similar goods (Stigler & Becker, 1977). This theoretical concept can be transferred to the sporting context where individuals can generate consumption capital through the repetitive consumption of sport (Schellhaaß & Hafkemeyer, 2002), example, by watching the Olympics on television. The individuals who watch sports with increased regularity and intensity are expected to have a higher level of consumption capital, as they become more familiar with the rules of sports, the technical aspects and the characteristics of different athletes. For example, being familiar with the rules of a sport is crucial for generating utility from sport consumption (Schellhaaß & Enderle, 1999). Individuals who do not understand the rules usually do not like watching a sport and therefore would not set a high value on sporting success. Being familiar with the athletes can also be important as sport spectators get a better idea of their performance and the dynamics of the competition. Individuals might also cheer for specific athletes and thus get more involved in the (passive) sport consumption process. Consequently, sporting success should have a higher value to them because watching sport is usually more enjoyable

when the supported athlete or team are more successful. However, knowing the athletes can take some time and consequently the consumption capital can only be generated slowly. In summary, it is suggested that people set value on Olympic success when they are interested in the Olympics and have some knowledge about the sports and the athletes. To put it the other way around: Why should somebody care about Olympic success when he/she is not interested at all in the Olympics? Therefore, it is assumed that consumption capital is a driver of the value of Olympic success in the current study.

Second, it is assumed that intangible factors have an impact on the value of Olympic success. Intangible factors refer to what economists have called the 'cultural significance' (Castellanos et al., 2011, p. 465) or the non-use value (Johnson et al., 2001) of sport events. From a theoretical perspective, these intangible factors can be referred to the concept of symbolic capital that has been introduced by Bourdieu (1984, 1989). Within the concept of different types of capital (economic, social and cultural capital), symbolic capital refers to the resources that are generated through honour, prestige or recognition (Bourdieu, 1984). This concept can serve to explain the value of Olympic success and the intangible benefits associated with it. Olympic success can generate public goods with symbolic character that also relate to honour, prestige, pride and recognition. With regard to pride, previous research on the value of Olympic success to the Canadian population has shown that 95.6% of the Canadians felt proud when a Canadian won a gold medal, 88.0% felt proud if Canada won more gold medals than any other country and 83.4% felt proud if Canadians won more gold medals than US athletes. Recognition and prestige were also related to Olympic success. For example 75.9% of the Canadians stated that winning gold medals would increase a country's international prestige and 84.0% stated that Canada's medal count would be important to Canada's standing in the world (Humphreys et al., 2011). Consequently, it is suggested that intangible factors significantly influence the value of Olympic success in the current study.

Third, it is assumed that the value of Olympic success differs among individuals with different socio-economic backgrounds and therefore socio-economic factors can also be determinants of the value of Olympic success. In this regard, human capital (Becker, 1962) and income can play a role. With regard to human capital it can be suggested that people with a higher educational level have a better perception of the importance of sporting success and might be more aware of the complex support mechanisms that are associated with elite sport development. In addition, individuals with a higher income have more monetary resources at their disposal and were found to state a higher WTP in previous studies on hosting the Olympic Games (Atkinson et al., 2008) and on the intangible effects of sport teams (Owen, 2006). Therefore, it can be suggested that educational level and income positively contribute to the WTP for Olympic medal success. Individuals of different age and gender can also assign a different value to Olympic success. In previous research on the value of sporting success in football no significant age and gender effects could be found (Wicker et al., 2012); however, it is important to check whether the nature of effects differs when investigating the Olympic Games as they cover several sports and football only plays a minor role during the Games.

Methodology

Data collection and sampling procedures

To estimate the value of Olympic success to the German population, a quantitative research design was chosen and a nationwide telephone survey was conducted using computer assisted telephone interviews. The telephone interviews took place from 24 May to 23 June 2011. A simple random sample was selected and three quality measures were used to guarantee a representative sample of the population. First, the Gabler and Häder (1999) approach was used to also include people who cannot be found in the telephone book. A total of 20,562 telephone numbers were produced by the computer through a randomised order of digits. After controlling for invalid numbers and business numbers, 9272 numbers remained. However, some of those numbers were not usable due to fax only or voicemail only numbers, resulting in a total of 5135 numbers that were called. Second, the last-birthday method was employed as to avoid that the person picking up (this might in some households always be the same person) answers all questions. Third, each household was called up to 10 times to be included in the sample when nobody picked up previously. Altogether, a total of $n = 2006$ interviews were conducted (response rate: 39.1%).

Measures and variables

A questionnaire was designed that contained a total of 16 questions. Table 1 presents an overview of the relevant variables. The telephone interviewer filled in the gender of the respondent (G). Then the interview started with a set of questions about the 2008 Beijing Olympics, followed by questions on major sport events in general, questions about the 2012 London Olympics and personal questions. The respondents' consumption capital was assessed using three questions. First, their ability to recall German gold medal winners at the 2008 Beijing Olympics was tested. Respondents were told that Germany has won a total of 41 medals including 16 gold medals and they were asked to state the names of German gold medal winners. As only a few respondents could state at least one name, this variable was recoded into a dummy variable ($NAMES$). It can be suggested that respondents who can state many names have a high level of consumption capital. Moreover, respondents who are interested in elite sports ($INTER$) and who cheer for German athletes ($CHEER$) are supposed to have a higher level of consumption capital as they are involved in elite sports and major sport events.

A set of intangible factors was assessed in the current study in order to investigate the importance of symbolic aspects and the non-use value of the Olympics. The respondents were asked to state their level of satisfaction with the medal performance of German athletes at the 2008 Beijing Olympics ($SATIS$) and whether they felt happy ($HAPPY$) or proud ($PROUD$) when German athletes win many medals, whether they talked with friends/colleagues about German medal success ($TALK$) and whether they thought it would be important for the reputation of Germany that German athletes win medals ($REPUT$). Afterwards, the interviewees were asked whether they thought that German athletes would act as role models in terms of performance ($PERF$), motivation ($MOTIV$), fairness ($FAIR$) and sense of community ($COMM$).

Table 1.   Overview of variables.

Variable	Description	Scale
	Value of Olympic success	
WTP01 MEDAL	Respondent stated a yearly WTP that Germany is ranked first in the final medal table of the 2012 London Olympics ($1 =$ yes)	Dummy
WTP MEDAL	Stated WTP per year for Germany being ranked first in the final medal table in the 2012 London Olympics (in €)	Metric
LN WTP MEDAL	Natural log of WTP MEDAL	Metric
WTP01 ATH	Respondent stated a yearly WTP that Germany wins a gold medal in track and field in the 2012 London Olympics ($1 =$ yes)	Dummy
WTP ATH	Stated WTP per year for Germany winning a gold medal in track and field in the 2012 London Olympics (in €)	Metric
LN WTP ATH	Natural log of WTP ATH	Metric
	Consumption capital	
NAMES	Respondents could state at least one name of a German gold medal winner at the 2008 Beijing Olympic Games ($1 =$ yes)	Dummy
INTER	I am interested in elite sports ($1 =$ yes)	Dummy
CHEER	I cheer for German athletes at Olympic Games and World Championships ($1 =$ yes)	Dummy
	Intangible factors (symbolic capital)	
SATIS	Satisfaction with the medal performance of German athletes at the 2008 Beijing Olympics ($1 =$ not satisfied at all, $5 =$ very satisfied)	Ordinal
REPUT	It is important to the reputation of Germany that German athletes win medals at Olympic Games or World Championships ($1 =$ yes)	Dummy
HAPPY	I feel happy when German athletes win many medals at Olympic Games or World Championships ($1 =$ yes)	Dummy
PROUD	I feel proud when German athletes win many medals at Olympic Games or World Championships ($1 =$ yes)	Dummy
TALK	I talk regularly to friends/colleagues about German medal success during Olympic Games or World Championships ($1 =$ yes)	Dummy
PERF	German athletes act as role models in terms of performance ($1 =$ yes)	Dummy
MOTIV	German athletes act as role models in terms of motivation ($1 =$ yes)	Dummy
FAIR	German athletes act as role models in terms of fairness ($1 =$ yes)	Dummy
COMM	German athletes act as role models in terms of sense of community ($1 =$ yes)	Dummy
	Socio-economic factors	
G	Gender ($0 =$ male; $1 =$ female)	Dummy
AGE	Age (in years); recoded into five equally sized groups: up to 32 years, 33–44 years, 45–53 years, 54–65 years, over 66 years	Dummy
EDU	Highest educational level attained ($1 =$ at least A levels/university entrance diploma, $0 =$ else)	Dummy
INC	Monthly net income in €; recoded into five equally sized income groups: up to €600, €601–1100, €1101–1610, €1611–2500, over €2501	Dummy

The respondents' WTP for two scenarios was assessed in the subsequent section on the 2012 London Olympics. The interviewees were informed that Canada had introduced a specific programme called *Own the Podium* to support Canadian athletes and that Canada was ranked first in the final medal table at the 2010 Vancouver Winter Olympics (Humphreys et al., 2011). They were told that the Olympic Summer Games would be held in London next year and their WTP for Germany being ranked first in the final medal table was assessed using the following open question: How much would you be willing to pay per year that Germany is ranked first in the medal table of the next Olympic Games? Afterwards, they were informed that track and field was one of the major sports at the Olympics and that the last gold medals in track and field were won by Heike Drechsler (long jump) and Nils Schumann (800m) at the 2000 Sydney Olympics. Then they were asked how much they would be willing to pay in order that a German track and field athlete would win a gold medal at the next Olympic Games. In summary, the value of Olympic medal success has been operationalised by assessing the WTP for Germany being ranked first in the final medal and for a German track and field athlete winning a gold medal.

The questionnaire finished with a set of questions about the socio-economic characteristics of the respondents. Interviewees were asked for their age using an open question. The metric age variable was recoded into five age group variables where every dummy variable had an equal size, that is, a similar number of respondents in each age group (*AGE*). The individual's highest level of education was assessed using a closed question with seven answer categories (from *1* = no graduation to *7* = university degree) and a further category assessing other graduations. The variable *EDU* was obtained by recoding the categories A levels/ university entrance diploma and university degree into *1* and all other categories into *0*. The telephone interview finished with an open question about the monthly net income of the respondent. The metric income variable was recoded into five equally sized income-group variables (*INC*) to allow better comparison of people with different incomes.

Sample characteristics

An overview of the descriptive statistics of the sample is provided in Table 2. With regard to the gender distribution, 53.5% of the respondents were females and 46.5% were males. The respondents had a mean age of 49 years, with an age range from 18 to 94 years. Altogether, 15.9% of the respondents had a migration background (i.e. person himself/herself or at least one parent was born in a foreign country) and 37.4% had at least a university entrance diploma as highest educational level attained. The monthly net income of the respondents ranged from €0 to €200,000 with a mean value of €1603.23 and a median of €1400. A comparison of the sample characteristics to the overall population in Germany (Federal Statistical Office, 2010) shows that the sample can be considered representative in terms of gender, age, percentage of people with a migration background and federal state.

Data analysis

The data were analysed using SPSS 19. First, an exploratory data analysis was conducted to check the responses for content validity. All responses to the WTP

Table 2.   Descriptive statistics.

Variable	Mean	SD
WTP MEDAL	6.13	25.02
LN WTP MEDAL	2.13	1.03
WTP ATH	5.21	25.28
LN WTP ATH	1.99	1.08
SATIS	4.13	0.79
Dummy variables	Percentage of respondents (in%)	
WTP01 MEDAL	36.6	
WTP01 ATH	31.4	
NAMES	6.2	
INTER	57.1	
CHEER	64.7	
REPUT	78.2	
HAPPY	65.6	
PROUD	66.2	
TALK	46.0	
PERF	85.4	
MOTIV	91.8	
FAIR	89.4	
COMM	86.5	
G	53.5	
AGE		
Up to 32 years	19.9	
33–44 years	20.7	
45–53 years	20.4	
54–65 years	19.4	
Over 66 years	9.2	
EDU	37.2	
INC		
Up to €600	13.1	
€601–1100	12.1	
€1101–1610	11.7	
€1611–2500	14.9	
Over €2501	9.6	

questions seemed meaningful and the maximum value of stated WTP amounted to €500 in both questions. There were no indications for a hypothetical bias and therefore no cases had to be removed from the analysis. Second, descriptive statistics were provided to answer the first research question (what is the WTP for being top place in the medal table and for winning a gold medal in track and field?).

Third, regression analyses were carried out to answer the second research question (which factors determine the WTP for being ranked first in the medal table and for winning a gold medal in track and field?). Altogether, four regression models were estimated. In the first (Model 1) and the second model (Model 2), the WTP for Germany being ranked first in the medal table served as dependent variable, whereas the WTP for a German winning a gold medal in track and field was the dependent variable in the third (Model 3) and fourth model (Model 4). In all four models, the

consumption capital factors, intangible factors and socio-economic factors were included as independent variables. With regard to the age and income dummies, the youngest age group (up to 32 years) and the lowest income group (up to €600) represented the reference categories. The four regression models have the following general equation:

$$WTP = \beta_0 + \beta_1 NAMES + \beta_2 INTER + \beta_3 CHEER + \beta_4 SATIS + \beta_5 REPUT +$$
$$\beta_6 HAPPY + \beta_7 PROUD + \beta_8 TALK + \beta_9 PERF + \beta_{10} MOTIV + \beta_{11} FAIR +$$
$$\beta_{12} COMM + \beta_{13} G + \sum_{i=1}^{5} \beta_i AGE + \beta_{15} EDU + \sum_{i=1}^{5} \beta_i INC + \varepsilon \qquad (1)$$

The first (Model 1) and third model (Model 3) were logistic regression models to provide information about the determinants of whether respondents stated a WTP (higher than zero) or not. In the logistic regressions, the WTP dummies served as dependent variables (Model 1: *WTP01 MEDAL*; Model 3: *WTP01 ATH*). In addition to the logistic regression models, two log-linear regression models were estimated to check which factors determine the absolute value of WTP if a WTP was stated. In the log-linear models, the natural log of the WTP variables (Model 2: *LN WTP MEDAL*; Model 4: *LN WTP ATH*) was used because the variables were positively skewed (Mincer, 1974). It represents the *real* relationships between variables and consequently improves the explanatory power of the models. To control for heteroscedasticity, regression models with robust standard errors were estimated (MacKinnon & White, 1985; White, 1980). The check for multicollinearity indicated no problems of multicollinearity as all variance inflation factors were below 10 (Hair, Black, & Babin, 2006) and all correlation coefficients below 0.9 (Tabachnick & Fidell, 2007). Autocorrelation should not be a problem because of the cross-sectional design. All independent variables were theoretically supported (see theoretical framework) suggesting that the application of a multivariate regression is appropriate. An α-level of 0.1 was used for all statistical tests.

Results

The descriptive statistics are summarised in Table 2. Only 36.6% of the respondents stated a WTP for Germany being ranked first in the final medal table and 31.4% stated a WTP for a German athlete winning a gold medal in track and field. The mean values of stated WTP amounted to €6.13 (Germany first in medal table) and €5.21 (gold medal in track and field). With regard to consumption capital, it is surprising that only 6.2% of the Germans remember at least one name of a German gold medallist in 2008. Altogether, 57.1% stated that they were interested in elite sports in general and 64.7% cheered for German athletes at Olympic Games and World Championships. With regard to intangible factors, the satisfaction with the performance of German athletes at the 2008 Beijing Olympics was 4.13 on average on a five-point scale. Almost four out of five (78.5%) respondents indicated that it would be important to the reputation of Germany that German athletes win medals at Olympic Games or World Championships and about two thirds of the respondents stated that it would make them proud (66.2%) or happy (65.6%). Almost half of the respondents (46.0%) talk to friends or colleagues about German medal success during Olympic Games or World Championships. The respondents mainly

confirmed that German athletes would act as role models in terms of performance (85.4%), motivation (91.8%), fairness (89.4%) and sense of community (86.5%) when they represent Germany at international competitions.

The results of the regression models are presented in Table 3. In Model 1, several variables have a significant influence on the dependent variable and therefore determine whether an individual stated a WTP for Germany being ranked first in the medal table or not. Individuals who remembered at least one name of a previous Olympic gold medallist at the 2008 Beijing Olympics (*NAMES*), who thought that winning medals at Olympic Games or World Championships would be important to

Table 3.   Results of the regression models for WTP for Olympic success.

	WTP for Germany being ranked first in final medal table		WTP for a German winning a gold medal in track and field	
	Model 1: WTP01 MEDAL	Model 2: LN WTP MEDAL	Model 3: WTP01 ATH	Model 4: LN WTP ATH
Const	−2.548***	1.493***	−2.524***	1.124***
NAMES	0.337*	0.205	0.233	0.115
INTER	0.296**	0.124	0.235*	0.256**
CHEER	0.019	0.017	0.229*	−0.084
SATIS	0.061	−0.005	−0.027	−0.002
REPUT	0.371**	−0.148	0.368**	−0.160
HAPPY	0.563***	0.113	0.356**	0.039
PROUD	0.116	0.173*	0.323**	0.120*
TALK	0.136	0.037	−0.067	0.044
PERF	0.001	0.038	0.153	0.079
MOTIV	0.275	0.055	0.278	0.298
FAIR	0.687***	0.126	0.715***	−0.197
COMM	0.060	0.074	−0.215	0.281
G	−0.070	−0.178**	−0.118	−0.151
AGE				
Up to 32 years	REF	REF	REF	REF
33–44 years	−0.338**	0.123	−0.233	0.265*
45–53 years	−0.227	0.173	−0.028	0.228*
54–65 years	−0.470***	0.307**	−0.360**	0.535***
Over 66 years	−0.506***	0.120	−0.350**	0.327**
EDU	0.061	−0.076	0.039	−0.032
INC				
Up to €600	REF	REF	REF	REF
€601–1100	0.266	0.210*	0.439***	0.277**
€1101–1610	0.293*	0.120	0.280*	0.118
€1611–2500	0.253*	246**	0.603***	0.108
Over €2501	0.477*	0.479***	0.616***	0.180
R^2	0.107	0.075	0.099	0.079
−2 LL	2170.616	/	2078.350	/
F	/	2.762	/	2.528
p	0.000***	0.000***	0.000***	0.000***

Note: Displayed are the coefficients; $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

the reputation of Germany (*REPUT*), who stated that it would make them happy if German athletes were to win many medals (*HAPPY*) and who regarded German athletes as role models in terms of fairness (*FAIR*) were significantly more likely to state a WTP. The results also reveal significant differences among age groups and income-groups. With regard to age, all age groups (except for the group from 45 to 53 years) were less likely to state a WTP than the youngest age group that serves as a reference. On the contrary, individuals with higher income were more likely to state a WTP than individuals from the lowest income-group.

In terms of the absolute value of WTP for Germany being ranked first in the medal table, the findings of the second regression model (Model 2) indicate that individuals who feel proud when German athletes win medals (*PROUD*) and males (*G*) are more likely to state a higher WTP. Moreover, individuals between 54 and 65 years of age stated a significantly higher WTP than individuals from the youngest age group. Respondents from all income-groups (except for the group from €1101 to 1601) stated a significantly higher WTP than respondents from the lowest income-group (Table 3).

The WTP for a German athlete winning a gold medal in track and field is also determined by several factors. The results of the third model (Model 3) show that individuals who are interested in elite sports (*INTER*) and cheer for German athletes (*CHEER*) were significantly more likely to state a WTP indicating that consumption capital is again important to whether an individual stated a WTP or not. Intangible factors also have a significant impact on the dependent variable as people who stated that it would be important to the reputation of Germany that German athletes win many medals (*REPUT*), who feel proud (*PROUD*) and happy (*HAPPY*) when German athletes win medals and who consider German athletes as role models in terms of fairness (*FAIR*) were significantly more likely to state a WTP. Individuals aged 54 and older were significantly less likely to state a WTP than individuals from the youngest age group. Income had a positive influence on the dependent variable as all income-groups were significantly more likely to state a WTP than the lowest income-group.

In terms of the absolute WTP for a German athlete winning a gold medal in track and field (Model 4), individuals who are interested in elite sports (*INTER*) and who feel proud when German athletes win many medals (*PROUD*) stated a significantly higher WTP. Moreover, the WTP from the older age groups was significantly higher than the WTP from the youngest age group and individuals from the second income-group (€601–1000) stated a higher WTP than those from the lowest income-group (Table 3).

Discussion and conclusion

The current study provided evidence of the value of Olympic success to the German population using a CVM approach, where the WTP for Germany being ranked first in the medal table and for a German athlete winning a gold medal in track and field was assessed. The distribution of the WTP values do not point to a hypothetical bias as all values were relatively low and no cases had to be excluded from the analysis. The average stated WTP for Germany being ranked first in the medal table ($M = 6.13€$) is slightly higher than for winning a gold medal in track and field ($M = 5.21€$) indicating that the overall medal performance has a higher value to the German population than a gold medal in a specific sport. However, both WTP values are lower than the WTP for amateur sport programmes in previous research in Germany (Wicker, 2011). Johnson (2008) has stressed that WTP for spectator sports

and sporting success was lower than for active sport consumption. A comparison between the value of Olympic success and success at the Football World Cup shows that the latter has a higher value to the German population (Rätzel & Weimann, 2006; Wicker et al., 2012). Yet, the WTP for Olympic medal success was substantially higher in the Canadian population ($M = \$98$; Humphreys et al., 2011). Consequently, the question arises as to why the WTP for Olympic success in the current study is substantially lower than the WTP for sporting success in other studies. Several explanations can be provided for this finding.

One reason for the lower WTP can be the time of the telephone survey that was conducted more than one year before the 2012 London Olympics and three years after the 2008 Beijing Olympics. It seems that the German population and also the media were no longer focusing on the previous Olympic Games in 2008 and were not yet to focus in detail on the next Olympic Games in 2012. Therefore, people were not receiving regular information about the Olympics in the daily or weekly news; it was not a *hot topic* at the time of the survey and therefore people may have been less likely to state a WTP. Previous research on the value of Olympic success was conducted only a few months before the event (Humphreys et al., 2011). Moreover, from a historical point of view, the German victory at the 1954 Football World Cup in Switzerland was considered important to the recognition of Germany after the Second World War; the German population might therefore have historically attributed more importance to sporting success in football than to Olympic success. Another reason could be that *hosting* the Olympics increases the value of sporting success to the resident population, which would explain the higher WTP in the Canadian study that was conducted before the 2010 Vancouver Olympics (Humphreys et al., 2011; Wicker et al., 2012). This explanation is supported by previous studies that assessed the WTP for hosting the Olympics because the WTP estimates were higher in those studies than in the current study (Atkinson et al., 2008; Walton et al., 2008). For those people for whom hosting the Olympics means a higher value of Olympic success may have beliefs in the (tangible) benefits of staging the Olympic Games. Yet, the current study was not about the WTP for hosting the Games, but rather about the value of Olympic medal success.

Another reason for the relatively low WTP values could be the fact that Germany did relatively well in the 2008 Beijing Olympics. German athletes won 16 gold medals in Beijing, three more than at the 2004 Athens Olympics and at the 2000 Sydney Olympics. Some gold medals such as Jan Frodeno in triathlon or Matthias Steiner in weightlifting were not expected and therefore, the German population could have been satisfied with the performance of the German athletes. This is also supported by the high level of satisfaction with the performance at the 2008 Olympics ($M = 4.13$ on a five-point scale). Another explanation could be that – from a German perspective – traditional rivalries are less relevant at the Olympic Games, particularly after German reunification in 1990. Previously, there was a considerable rivalry between the two separated parts of Germany in terms of sporting success. In fact, while traditional rivalries exist in football between England and Germany, this is not the case at the Olympic Games. Therefore, the German population could have attributed a lower value to Olympic success than to sporting success in football. On the contrary, other nations do have these traditional rivalries at the Olympic Games, for example, the Canadians who compare their medal performance with the US

(Humphreys et al., 2011) and the Australians with Great Britain and Northern Ireland (Sotiriadou, 2009).

Another surprising finding was that only 6.2% of the population could name at least one German gold medallist in 2008. In view of the fact that many people stated that they were interested in elite sports and supported German athletes, the recall of Olympic gold medallists can be considered poor. One explanation for this finding may be that Germany did not win many gold medals in the three main sports at the Olympic Games (swimming, gymnastics and track and field) and therefore, many people could not remember the names of the gold medal winning athletes since their sports were usually not televised. Moreover, as the World Championships are held in the year after the Olympics in many sports (e.g. swimming, track and field), people might not have been able to distinguish between Olympic success and success at World Championships. Overall, the particularly low percentage of people who could recall Olympic champions, points to a low level of consumption capital in terms of Olympic Games.

Nevertheless, consumption capital was found to be associated with the value of Olympic success. This finding is consistent with previous research on the value of sporting success in football (Wicker et al., 2012). When comparing the logistic regression models with the log-linear models, it is evident that consumption capital is particularly important to whether individuals state a WTP or not, that is, whether they set at least some value on sporting success. It could also be argued that Olympic success can increase the consumption of sports and therefore also people's consumption capital if they watch sports more often. Yet, the current study was not about Olympic success per se and its influences on people's consumption behaviour, but rather about WTP and thus the financial evaluation of Olympic success.

In addition to consumption capital, intangible factors were found to be important determinants of the value of Olympic success. In particular, the increasing reputation of Germany through Olympic success and the role model of German athletes in terms of fairness had a positive influence on WTP. Previous research has also stressed the national importance that was attributed to sporting success (Humphreys et al., 2011). Moreover, individuals who felt proud and happy when German athletes won multiple medals attributed to a higher value of Olympic success. Thus, the current study supports the importance of intangible effects of sport events that were found to exceed the tangible effects in previous research (Johnson et al., 2001; Owen, 2006).

Socio-economic factors were also found to influence the value of Olympic success. With regard to income, individuals with higher income tend to state a higher WTP than people from the lowest income-group. This finding is in accordance with previous research on the determinants of WTP (Atkinson et al., 2008; Johnson, Mondello et al., 2007; Owen, 2006). With regard to the age effect, the contrary signs of the coefficients indicate that older people were less likely to state a WTP, but if they decided to do so, the amount of stated WTP was higher than those of younger people. This difference was particularly evident in Model 4 where the WTP for a German athlete winning a gold medal in track and field was analysed. One explanation can be that older people still remember the Olympic success of track and field athletes such as Heide Rosenthal (gold in long jump and 4×100 m relay at the 1972 Munich Olympics) and Ulrike Meyfarth (gold in high jump at the 1972 and 1984 Olympics); these athletes are all still present on German television when it comes to talking about Olympic success.

The findings of the current study have several implications for policy-makers and sport management researchers. First, as consumption capital was found to be a determinant of the value of Olympic success, it is important – in case you would be interested in increasing the value of sporting success – that people have the opportunity to generate more consumption capital, that is, through broadcasting sports on television. In this context it is crucial that more information about Olympic sports is provided, including during non-Olympic periods. Second, as cost-benefit analyses mainly focus on tangible effects, it can be recommended that estimates on the value of Olympic success and on the intangible effects of sport events are also integrated into cost–benefit analysis. CVM would represent an appropriate approach in this regard. As previously mentioned, tangible effects were not sufficient to justify the use of taxpayers' money for sport events (Johnson, 2008). Therefore, as a third implication, estimates on the value of Olympic success can be used to justify public subsidies for major sport events and also for elite sport development programmes. As sporting success has a certain value to the population, elite sport programmes that aim at winning Olympic medals can, and have to be, justified given the price of Olympic gold (Hogan & Norton, 2000). Such programmes have been already established in several countries such as Canada and Australia (Green & Houlihan, 2005; Humphreys et al., 2011; Sotiriadou, 2009), usually in the context of hosting the Olympics (Humphreys et al., 2011) or responding to unsatisfactory performance at previous Olympic Games (Sotiriadou, 2009). Fourth, Olympic medal success may have an impact on the sport participation of the resident population. The population of a region may have health benefits as a result of increasing sport participation and grass roots sports (Atkinson et al., 2008; Jinxia & Mangan, 2008; Kaplanidou & Karadakis, 2010). This effect is usually referred to as the trickle-down effect (Sotiriadou, Shilbury, & Quick, 2008). However, no evidence of an increase in participation as an effect of hosting the Olympic Games could be found up to now despite some attempts (e.g. Grant Thornton LLP UK, ECORYS, & Centre for Olympic Studies and Research Loughborough University, 2011a, 2011b, 2012; McCartney et al., 2010; Weed, Coren, & Fiore, 2009). Further research is needed to clarify whether there may be a trickle-down-effect as a result of Olympic medal success, that is, whether successful sports at the Olympics lead to increases in participation numbers after the event.

The current study has some limitations that also provide directions for future research. First, the R^2s of the four regression analyses show that the regression models only explain between 7.5% and 10.7% of the variation in the dependent variables. It seems difficult to explain the value of Olympic success. The scant body of research on the value of sporting success (see literature review section) indicates that more research is needed in this field. The modest R^2 values suggest that further variables could be relevant to explain the value of sporting success to the population such as the level of individual sport participation and their interest in specific sports. These consumption indicators should be included in future studies on the value of sporting success. Moreover, it would be interesting to evaluate qualitatively why such a high share of respondents did not state a WTP at all and assigned no value to Olympic success. Another limitation of the study relates to the cross-sectional data-set that only allows providing information about the status quo. However, it would be interesting to investigate the value of Olympic success just days before the Olympic Games, during the course of the Games and after the Games. Furthermore,

it would be interesting to compare the value of sporting success among different countries to investigate cultural differences.

Acknowledgement

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