Title

Valuing elite sport success using the Contingent Valuation Method: a transnational

study

Highlights

- The Contingent Valuation Method was used to value elite sport success on a transnational basis.

- Samples of adults in five countries were asked for their willingness to pay (WTP) for a 'high-performance sport fund' in order to avoid a decline in medal performance at the next Summer Olympic Games.

- Respondents in the more successful medal winning countries reported higher WTP than those in the relatively less successful countries.

- In line with welfare economics theory, more medals won appears to be linked with more utility among individuals.

Abstract

This study presents an application of the contingent valuation method for valuing medal winning success on a transnational basis to test whether more medals won equates to more utility. To achieve this aim, a research project was set up in five countries: Belgium, Finland, Japan, the Netherlands, and the United Kingdom. Respondents were asked to state their willingness to pay (WTP) to avoid a hypothetical scenario in which a large-scale reduction in government funding for elite sport was implemented after the Rio 2016 Olympics resulting in a 50% reduction in medals won at the Tokyo 2020 Olympics. Our empirical results show that WTP for avoiding reduced medal winning performance differs significantly between countries with the more successful countries reporting higher WTP values than the relatively less successful countries. This finding indicates that more medals won appears to be linked with more utility. The validity tests on the regression models were generally consistent with the theoretical expectations. Implications are discussed in terms of how governments can promote elite sport development while being conscious of the public's acceptability of such investment.

Keywords: Olympic success; monetary value; welfare economics; willingness to pay; international comparison

1. Introduction

The rationale behind government investment in elite sport is based on an assertion that success contributes positively to realising a wide-range of desirable outcomes. These outcomes can be inward-looking such as a feel-good factor amongst the population, or increases in mass participation sport; and also outward-looking such as increases in international prestige (De Bosscher, Sotiriadou, & van Bottenburg, 2013; Grix & Carmichael, 2012; Haut, Grix, Brannagan, & Hilvoorde, 2017). As an example, the Basic Act on Sports (2011), in Japan, recognises the internal benefits of elite sport success in the statement: "the great success of Japanese players in international competitions based on these efforts brings pride and joy, vision and excitement to citizens and enhances their interest in sport" (Supplementary provisions, para. 5). Similarly the UK Government's strategy for sport emphasises the importance of maximising international sporting success for two reasons: first, positive impacts on wellbeing and social development; and second as a form of inspiration to get more people involved in sport (HM Government, 2015).

Despite the increased desire for elite sport success and the investment made in achieving it, the academic evidence to support the 'success provides societal outcomes' argument is limited. Grix and Carmichael (2012) stated that "the rationale for investment in elite sport remained and remains unclear, under-researched and generally uncritically accepted" (p.3). Presumably, the weak evidence is attributable to the difficulty of quantifying such outcomes due to their intangibility (Stewart, Nicholson, Smith, & Westerbeek, 2005), and the unchallenged assumption that these claimed outcomes are self-evident (De Bosscher et al., 2013). The empirical evaluation of these outcomes is an area of increasing interest and an important emerging research topic in the field of sport management and economics.

In order to address part of the research gap, recent studies have used the contingent valuation method (CVM), which is a survey-based stated preference methodology, to estimate the non-use value of Olympic medal success. Such studies have been conducted previously in Germany (Wicker, Hallmann, Breuer, & Feiler, 2012), Japan (Funahashi & Mano, 2015), and Canada (Johnson, Mason, & Whitehead, 2018). This emerging body of literature has contributed significantly to demonstrating demand side information, elicited in monetary terms, to the debate around the justification for elite sport investment. The practical problem, however, that confronts us is the comparability of the studies owing to differing definitions of success and the variations used in underpinning assumptions. To the best of our knowledge, no transnational assessment of the value of elite sport success has been conducted, although the notion was considered to be an important research direction (Wicker, Prinz, & Hanau, 2012).

The current study advances the extant literature in this area by presenting an international comparison of the monetary value of medal winning success in the Summer Olympic Games. To achieve this advance in knowledge, the authors formulated a research project designed to explore differences in the perceived value of (i.e., willingness to pay for) elite sporting success in five nations, controlling for differences in international competitiveness (i.e., the number of medals won). The objective of this paper is to examine the relationship between national Olympic performance and the general public's non-use value of elite sport success between the sample nations.

2. Literature review

2.1. A summary of the contingent valuation method

1   CVM is a research method used to elicit people's preferences and attitudes

2   towards public goods (Mitchell & Carson, 1989). Unlike private goods, there are no

3   market prices for public goods, however CVM circumvents the absence of markets for

4   public goods by presenting respondents with a hypothetical market for changes in the

5   quantity and/or quality of a particular non-market good, which they have the

6   opportunity to value. This method can be classified as a stated preference approach

7   which directly asks respondents about the monetary value of goods or services

8   (Bateman et al., 2002). Relative to revealed preference methods, in which data are

9   derived from past individual behaviour, such as travel cost and hedonic methods; CVM

10   is a more flexible valuation approach to policy analysis as it can be used to estimate

11   economic values under conditions of demand and supply uncertainty (Whitehead &

12   Blomquist, 2006). Accordingly, "any quasi-public good, for which there are implicit

13   markets for comparison, and pure public goods, for which no implicit market exists, are

14   [both] within the domain of CVM applicability" (Whitehead, 2014, p.89).

15   In recent years, CVM has become a popular method for valuing a variety of

16   sport-related public goods. For instance, it has been used to estimate the monetary

17   values of non-market/public goods generated by professional sport clubs (Castellanos,

18   García, & Sánchez, 2011; Johnson, Groothuis, & Whitehead, 2001), sport recreation

19   programmes (Johnson, Whitehead, Mason, & Walker, 2007), voluntary sport coaching

20   (Orlowski & Wicker, 2016), hosting mega-sporting events (Atkinson, Mourato,

21   Szymanski, & Ozdemiroglu, 2008; Vekeman, Meulders, Praet, Colpaert, & Van

22   Puyenbroeck, 2015; Walton, Longo, & Dawson, 2008; Wicker, Whitehead, Mason, &

23   Johnson, 2017; Whitehead & Wicker, 2018), sport facilities (Johnson & Whitehead,

24   2000; Johnson, Whitehead, Mason, & Walker, 2012), sport success in football (Wicker

25   et al., 2012b), and Olympic success (Funahashi & Mano, 2015; Humphreys et al., 2018;

Wicker et al., 2012a). CVM provides important insight by which to assess the public's perception of non-market sport goods (Walker & Mondello, 2007).

2.2. The application of CVM to elite sporting success

Many of the desirable outcomes of international sporting success (e.g., improved national morale, a feel-good factor, or national pride) are non-excludable and non-rivalrous—that is, once it has been provided to an individual, others cannot be prevented from enjoying the good, and all people can enjoy these benefits together with no congestion in consumption. In other words, international sporting success produces public goods (Gratton &Taylor, 2010; Mitchell, Spong, & Stewart, 2012). Therefore, unlike private goods, the suppliers (e.g., teams, athletes, administrators, etc.) cannot charge individuals for their consumption of these intangible outcomes (i.e., market failure). Hence, there is a potential role for public policy in the management of high performance sport systems; as well as a need for information on the values derived via policy implementation. These outcomes are also called passive use (or non-use) values, because they are not connected directly to actual usage or real purchase activities (i.e., use values) (Humphreys et al., 2018).

How, then, can we measure the non-use value of public goods generated by medal success? The proposed answer is to apply welfare economics, which argue principally that rational individuals are willing to pay more so long as they can secure greater utility, or can improve their welfare (Mitchell & Carson, 1989). However, unlike private goods, public goods theoretically have no market price. Also, public goods are exogenous and each consumer cannot choose the quantity consumed. For these reasons, it is not possible to evaluate the consumer surplus as a measure of welfare change resulting from variation in price. Therefore, the surplus measure of non-market goods takes the form of a variation in quantity/quality. In rigorous economic terms, CVM

estimates the Hicksian consumer surplus (Hicks, 1943) - either the compensating variation, or the equivalent variation, arising from quality/quantity changes in non-market goods (Freeman, Herriges, & King, 2014). For instance, if a new project was started with the aim of doubling the number of medals won in the next Olympic Games, people's utility would probably increase if the nation's medal tally increased as a result of the project. By creating a hypothetical scenario, or contingent situation, and asking "how much would you be willing to pay to achieve the aim", we can assume a similar situation as is the case for conventional goods traded in a market - this is the essence of the CVM approach.

The first way to evaluate the welfare effects of changes in medal performance is to use the compensating surplus measure. The compensating surplus is the amount of money an individual would need to pay in order to obtain the initial utility level after a quality or quantity change in public goods (Freeman et al., 2014). When a policy change leads to a quality/quantity increase, the compensating surplus is the willingness to pay (WTP) to obtain the increase. A given individual's situation is positioned at point A, where their income is M' and number of medals is Q' (Figure 1). Then, suppose the number of medals increases from Q' to Q". When an individual's income remains as M', and the number of medals increases, their circumstances move from A to B, and the utility level increases from U' to U". Meanwhile, C, as with A, is a point on an indifference curve, and although income is low, the increase in the number of medals is higher than A. At the same time, point C is a situation where the amount of money is deducted from point B by the amount M' to M". In other words, this means that even if the increase in the number of medals increases to Q", when the amount of money M'-M" is paid, the utility level returns to the original U' at which performance does not increase. That is, this M'-M" is the maximum amount of money that the individual is

willing to pay to gain a performance increase, even if it results in decreased personal

income. Most literature to date has used the compensating surplus (an improvement in

performance levels in the future). For example, Wicker et al. (2012a) estimated the

value of Germany being ranked first in medal table. Funahashi and Mano (2015)

assessed the value of public goods that were created from the investment in elite sport

policy designed to achieve Japan being ranked in the top five in gold medals won at the

summer Olympics and in the top 10 at the winter Olympics.

For the second way to evaluate the welfare effects of changes in medal

performance, we consider a case where medal performance would deteriorate based on

equivalent surplus. The equivalent surplus is the amount of money an individual would

need to be paid to obtain the subsequent utility level after a quality/quality change

(Freeman et al., 2014). When a policy leads to a quality/quantity decrease, the

equivalent surplus is the WTP to avoid the decrease. A given individual's situation is

positioned at point B, where income is M' and performance is Q' (Figure 1). Then,

suppose the number of medals decreases from Q" to Q'. If the individual's income stays

at M' and the number of medals decreases, the individual's situation moves from point

B to point A, and the utility level decreases from U" to U'. Meanwhile, point C, as with

point A, is a point on an indifference curve, and although the income is lower than at

point A, the number of medals won is greater than at point A. At the same time, point C

means that when the amount of money M'-M" is paid, the utility level returns to the

original U' where deteriorating medal performance is not avoided (utility level at point

C = utility level at point A). In other words, this M'-M" is the maximum amount of

money that the individual is willing to pay to avoid a decline in medal performance,

even if it results in decreased personal income. Research using equivalent surplus is

currently not evident in the elite sport literature to the best of our knowledge.

1

Income
M′ A B
WTP
M″ C
U″
Indifference curve
U′
Q′ Q″ Medal performance
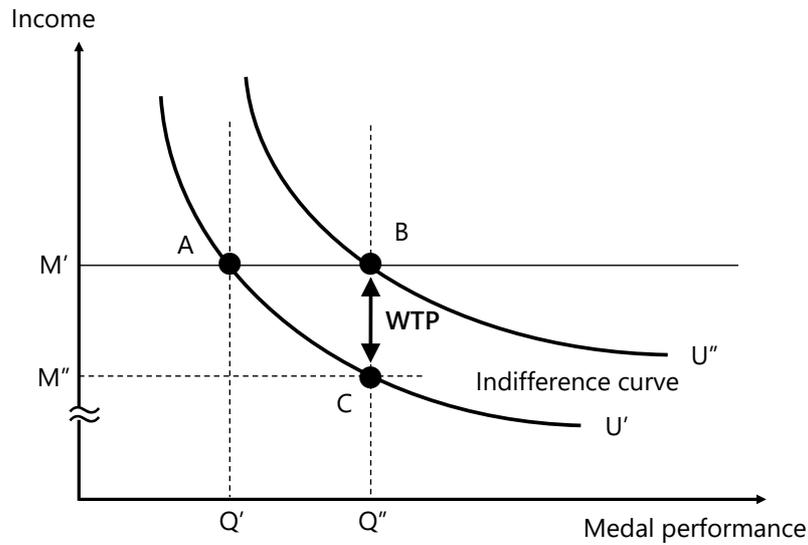
2

3   *Figure 1*. Surplus measures for changes in medal performance

4

5   In line with welfare economics theory, the WTP value should vary with the

6   magnitude of the good in question: the greater the amount of the good, the higher the

7   WTP should be and *vice versa* (Olsen, Donaldson, & Pereira, 2004). That is, a 'more

8   medals equals more utility' assumption can reasonably be expected in the context of

9   elite sport. This assumption can be tested by measuring the equivalent surplus for

10   avoiding fewer medals won amongst countries with heterogeneous performance (i.e.,

11   goods of different magnitudes).

12   The transnational comparison research design also allowed for an external scope

13   test to be run, based on the quantity of medals won in each country. A scope test looks

14   at whether respondents are willing to pay more (less) for a good that is larger (smaller)

15   in scope, either in a quality or quantity sense (Carson, Flores, & Meade, 2001), and the

16   test is widely recommended as a way to evaluate the validity of CVM (Heberlein,

17   Wilson, Bishop, & Schaeffer, 2005). In the present study, if respondents in countries

18   with greater medal performance presented a higher WTP, the CVM passes the scope

test. Until now, only few sport CVM studies have applied scope tests (Johnson et al., 2007; Johnson et al., 2012), and the results of our study provide important new evidence in this regard.

2.3. The determinants of WTP for elite sporting success

The public's WTP for elite sport success seems to be not only a simple function of medal performance, but also an interaction with other determinants. In any CVM studies, there are usually several expectations regarding the relationship between the WTP and indicators such as use of the good, reported attitudes regarding the good, membership of relevant interest groups, concern about the good, and the socio-economic characteristics of the respondents (Bateman, et al., 2002). Assessing the degree to which the findings of a study are consistent with theoretical expectations is an important approach to determine their expectations-based, or theoretical, validity (Mitchell and Carson, 1989). If crucial variables are found to be insignificant or affect the stated values in an inexplicable way, then the experiment's theoretical validity remains debatable. Some of those expectations are derived from economic theory (i.e., income), while others are based on findings in prior studies, which seem intuitively logical, as outlined below.

Firstly, the relationship between use, or consumption, of elite sport, including the frequency of watching the Rio 2016 Olympic Games on TV or how actively individuals consume sports, and the WTP is expected to be positive. This assumption is based on prior CVM studies on elite sport which reveal that a high level of sport related consumption capital was an important determinants of the WTP for international sporting success (Wicker et al., 2012a; Wicker et al., 2012b). Secondly, a respondent's perceived benefits of elite sport success were expected to influence WTP positively. Previous CVM studies on elite sport have revealed that social and intangible factors,

such as the importance of success for the prestige of the nation (Humphreys et al., 2018), are positively related to the WTP for sporting success. Similarly, personal benefits, such as the feelings of happiness and pride through national sporting success (Wicker et al., 2012a), were also found to be significant factors. Thirdly, we would expect that having a stake, or interest, in elite sport success might be a positive predictor of stated values. Fourthly, another basic expectation is that WTP should vary in accordance with the concern about the risks associated with a good. Thus, those respondents who perceive fewer potential risks associated with elite sport development would be expected to have higher WTP scores. This assumption is supported by the previous work which reported that the public's perceived value of elite sport policy was adversely influenced by the perception of negative impacts associated with elite sport development (Funahashi & Mano, 2015). With regard to socio-economic variables, an important expectation derived from economic theory is that there is a positive association between WTP and a respondent's household income. This assumption is supported by many previous findings notably (e.g., Wicker et al., 2012a). Conversely, there are typically no prior theoretical expectations in relation to the other demographic variables on the survey such as gender and age.

3. Methods

3.1. Research design

In order to test the relationship between national Olympic performance and the non-use value of elite sport success, this study employed cross-sectional survey design across five countries with different levels of sport performance, i.e., Belgium, Finland, Japan, the Netherlands, and the United Kingdom. The countries are a subset of the 15 nations that took part in the Sports Policy factors Leading to International Sporting

1 Success 2.0 study (De Bosscher et al., 2015). They were selected on the basis of the

2 differences in international competitiveness and allocation of government funding

3 between elite sport and grassroots sport (De Bosscher et al., 2015), cultural diversity

4 (House et al., 2004), and the convenience of being willing to take part in an additional

5 research collaboration.

6 ### 3.2. Instruments

7 ### 3.2.1. CVM scenario and WTP question

8   To estimate respondents' WTP for elite sporting success, the survey asked

9 respondents to consider the hypothetical scenario presented below.

10   Suppose that due to recent budgetary constraints, a large-scale reduction in
11   government funding for all of elite sport expenditure is implemented after the Rio
12   de Janeiro Games in 2016. Without the government's financial support for elite
13   sports at the national level, it will be difficult to maintain current levels of sporting
14   competitiveness. It is therefore highly likely that the country's performance at the
15   Tokyo Games in 2020 will suffer.
16   To compensate for the reduction in government funding, suppose that a group of
17   elite athletes proposes to establish a 'high-performance sport fund'. The fund
18   would be appropriately implemented by a new and highly transparent organisation
19   and will enable the continuation of a range of projects and policies designed to
20   deliver elite sport success as described above. As a result of this project, current
21   performance standards would be maintained.
22   By contrast, if the project is not implemented, we expect to see the number of
23   medals won to fall to [#], only half as many, in the Tokyo Games in 2020
24   compared with the Rio de Janeiro Games in 2016.
25   Assume that the 'high-performance sport fund' is set up with funds consisting of
26   donations from the public. In the event that the total amount of donations is not
27   sufficient to implement the project, these donations will be returned to each donor.
28   If you were asked to contribute, would you agree to make a donation?

29

1   Each individual was asked to indicate their willingness to pay for the 'high-

2   performance sport fund' in order to avoid the 50% decline in medal performance

3   according to the following format: *I would donate* or *I would not donate*. That is,

4   respondents were asked to choose the alternative which maximized their utility between

5   two situations. The first entailed the existing performance level being maintained in

6   Tokyo 2020 because of a group of elite athletes establishing a 'high-performance sport

7   fund' financed by voluntary donations, or reduction in his/her private consumption (i.e.,

8   *I would donate*). The second entailed a reduction of 50% in the total number of medals

9   won in Tokyo 2020, compared with Rio 2016 as a result of a large-scale cut in

10   government funding for elite sport (i.e., *I would not donate*). The scenario in which the

11   number of medals won decreased by half, due to withdrawal of government financial

12   support, is based on the inference that approximately 50% of medal success might be

13   explained by the competitiveness of a nation's elite sport development system (De

14   Bosscher et al., 2015). The creation of a scenario that a government withdraws funding

15   from elite sport and medals decrease by 50%, based on the previous empirical study (De

16   Bosscher et al., 2015), has merit in the sense that WTP can be also regarded as the

17   monetary value of current elite sport policy. Finland won only one medal at the Rio

18   Olympics and for this reason the scenario was modified such that medals won in Tokyo

19   2020 would be zero. The hypothetical changes in the quantity of the medals won by

20   each nation are summarised in Table 1. Prior to the WTP question, respondents were

21   given descriptions and information about their national elite sport policy using visual

22   aids: some major national elite sport programmes, and changes in the number of medals

23   won in the summer Olympic Games from 1988 to 2016.

24

25   *Table 1.*

The present state and the proposed changes in the quantity of the good

	UK	Japan	Netherlands	Belgium	Finland
Current situation (Q')[a]	67	41	19	6	1
Hypothetical situation (Q")[b]	33	20	9	3	0
Change in the quantity of medals	-34 (-50%)	-21 (-50%)	-10 (-50%)	-3 (-50%)	-1 (-100%)

[a] The number of medals won in Rio 2016.
[b] The hypothetical number of medals won in Tokyo 2020.

The questionnaire was developed initially in English, then translated into other languages by researchers with expertise in elite sport policy development in each country to ensure comparability and accuracy particularly in terms of the cultural context. The hypothetical scenario and the WTP question were audited and validated by an expert reviewer who had significant expertise and publications in CVM studies. Prior to the survey, several pilot tests were conducted on student panels and other samples of approximately 100 online respondents in each country in order to test respondents' cognition of the scenario and the general readability of the questionnaire. Modifications were made where wording was perceived to be ambiguous and an entire section discussing the positive and negative aspects of elite sports was entirely deleted on account of the potential for information bias.

3.2.2. Measures of the determinants of WTP

Consistent with Bateman et al. (2002), we included variables relating to the use of the good (i.e., frequency of watching Rio 2016 Olympics on TV, sports fanship intensity); attitude towards a good (i.e., perceived benefits of elite sport); concerns about the good (i.e., perceived risks of elite sport); membership of interested groups (i.e., those who are, or used to be, a participant in competitive sport; those who were involved with an elite sport organisation); and a range of standard socio-economic variables (i.e. gender, age, age^2, and household income).

To measure the frequency of watching Rio 2016 on television, we used the following question: "How often did you watch the Rio 2016 Olympics on TV?" The item was scored on a 4-point Likert scale from 1 (not at all) to 4 (every day), which was converted to a dummy variable representing 1 for active viewer (everyday/most days) and 0 for others. For the measure of sports fanship intensity, the Modified Sports Fan Index (MSFI) (Levy, 2009), which is an overall measurement of an individual's sport consumption activities, was used and those who were classified as 'avid sports fan' (MSFI more than 17) were dummy coded 1, and others were coded 0. Items were modified with wording changes to refer to the new technology for consuming sport (i.e. mobile app, online news, and mobile devices).

For the measurement of the perceived benefits of elite sport, five items which are often argued to be the positive outcomes of elite sport success were extracted from the literature (Funahashi, De Bosscher, & Mano, 2015; Grix & Carmichael, 2012; Wicker et al., 2012a): national identity, economic impact, sports participation, a feel-good factor, and international reputation. These survey items were measured on a 7-point Likert-type scale (i.e. strongly agree to strongly disagree). A mean score 5 or more was coded 1 (high benefits perception group) and a score under 5 was coded 0 (low benefits perception group).

Two simple dichotomous choice questions were included in order to identify the individuals who are, or used to be, participants in competitive sport, or who were involved with an organisation that was concerned with elite sport.

The respondents' risk perception associated with elite sport development was measured using four items found in the existing literature (Funahashi and Mano, 2015; Park, Lim, & Bretherton, 2012; Volkwein, 1995), that is: elite sport: creates an unhealthy focus on winning at all cost; causes physical abuse and harassment of

athletes; negatively affects athletes' education; and, causes unethical practices such as doping and match fixing. These survey items were measured on a 7-point Likert-type scale. A mean score 3 or less was coded 1 (low risk perception group) and a score greater than 3 was coded 0 (high risk perception group). A 5 point Likert scale was used by exception in the Belgian survey.

3.3. Surveys and sample collection

The web-based questionnaire surveys in five countries were conducted through recognised commercial market research companies between October 2016 and February 2017. Each company was able to target nationally representative samples in each country. In the CVM studies, as described later, a considerable number of responses will be lost in the process of analysing the WTP. Thus, with the objective of obtaining at least 1,000 usable responses of adults for the estimation of WTP (to achieve a 95% confidence interval of ±3%), the set sample size and attributes in the present study were as follows: approximately 1,500 adults, 18–69 years, stratified by a distributions equivalent to each country's population figures regarding key demographics (gender and age). Potential respondents were randomly selected by the survey companies according to the set sample size and attributes from the database and invited to complete the survey via email. The email invitations included the URL for accessing the survey, and potential respondents had a free choice as to whether they answered the questionnaire. To reduce self-selection bias (Bateman et al., 2002), the survey were titled 'Questionnaire about life' rather than 'Questionnaire about the value of international sporting success'. In Belgium, the CVM questions were incorporated in a comprehensive survey investigating public perceptions of the societal impact of elite sport. For the Netherlands, the CVM questions were incorporated in the NOC*NSF's periodic market survey. There is no clear evidence of substantially lower quality or

validity of Internet responses compared with other survey modes (Lindhjem and Navrud, 2011).

3.4. Analysis

3.4.1. WTP estimation procedure

There are many possible sources of bias in CV studies. Several bias mitigation techniques were employed to enable the WTP estimation to be more precise. In an effort to mitigate or calibrate for hypothetical bias and responent uncertainty in the WTP survey responses, we employed both 'cheap-talk script' and follow up certainty statement calibration techniques (Broadbent, 2014). To include a cheap-talk script before the WTP question is a recognised solution for reducing bias, as first reported by Cummings and Taylor (1999). It encourages study participants to respond to the hypothetical question as if they were making an actual financial decision. Before stating their willingness to donate, each respondent was asked to answer by: carefully considering that the assumption actually occurred; noting that the donation was a one off occurrence; and, realising that by making the donation the amount of money they would have to spend on other things would decrease. As a follow up question, respondents who stated *I would donate* were asked how certain they were that they would really donate if asked to do so on a ten-point scale (with endpoints labelled: 1 = very uncertain and 10 = very certain). Experimental results suggest that levels of certainty greater than or equal to six are relatively consistent with an actual payment (Poe, Clark, Rondeau, & Schulze, 2002). As such, we defined those who gave a six or higher as those who were certain about their willingness to pay and this subset was subsequently asked to state their maximum WTP via an open-ended question.

Another treatment that is common to CV literature, is to design a survey that eliminates so-called 'warm glow' and 'protest zero' bidders (Grammatikopoulou &

1   Olsen, 2013). Warm glow bias is where a respondent's WTP is for the purchase of

2   moral satisfaction associated with giving for a good cause rather than for the good itself,

3   leading to an upward-biased estimate of WTP (Andreoni, 1990). In order to identify

4   warm glow respondents, those who answered *I would donate* with high certainty (i.e.,

5   ≥6), were asked their most appropriate reason for stating a positive WTP. Three

6   possible reasons in a closed question format plus an open-ended opportunity to provide

7   other comments were presented. One out of three reasons was interpreted as being

8   consistent with a warm glow effect, showing moral satisfaction (i.e., because I think it is

9   important that everyone makes a donation). The next set of follow-up questions was

10   used to identify true zero and protest zero bidders by asking respondents their most

11   important reason for answering *I would not donate*. Protest zeros is a WTP score of 0,

12   which is given because a respondent wishes to make a protest against the payment

13   vehicle or some other aspect of the survey, not because the respondent truly places zero

14   value on the good being valued (Diamond and Hausman, 1993). Including protest zeros

15   leads to the underestimation of WTP, because they are zero values. The range of options

16   summarised in Table 2 was based on the findings of Funahashi and Mano (2015) and

17   the methodological manual (Bateman et al., 2002). Figure 2 presents the flow chart of

18   the questions asked in the WTP section of the survey.

19

20   *Table 2.*

21   *Survey options for reason questions on WTP and its classification*

The reason	classification
to donate	
Because the fund has social importance that merits my donation	WTP>0
Because the fund is of personal benefit to me	WTP>0
Because I think it is important that everyone makes a donation	warm glow
Other[a]	WTP>0/warm glow[b]
NOT to donate	
Because this fund does not have social importance that merits my donation	WTP=0
Because making a donation to this fund is not of personal benefit to me	WTP=0
While it is important to support elite athletes, I cannot afford to make a donation	WTP=0
While it is important to support elite athletes, it should be funded by the government using tax that already been paid	protest zero
The scenario is not sufficiently realistic for me	protest zero
Other[a]	WTP=0/protest zero

[a] Those who answered 'Other' were asked to specify the reason.

1

[b] There was no respondent identified as warm glow

2

3
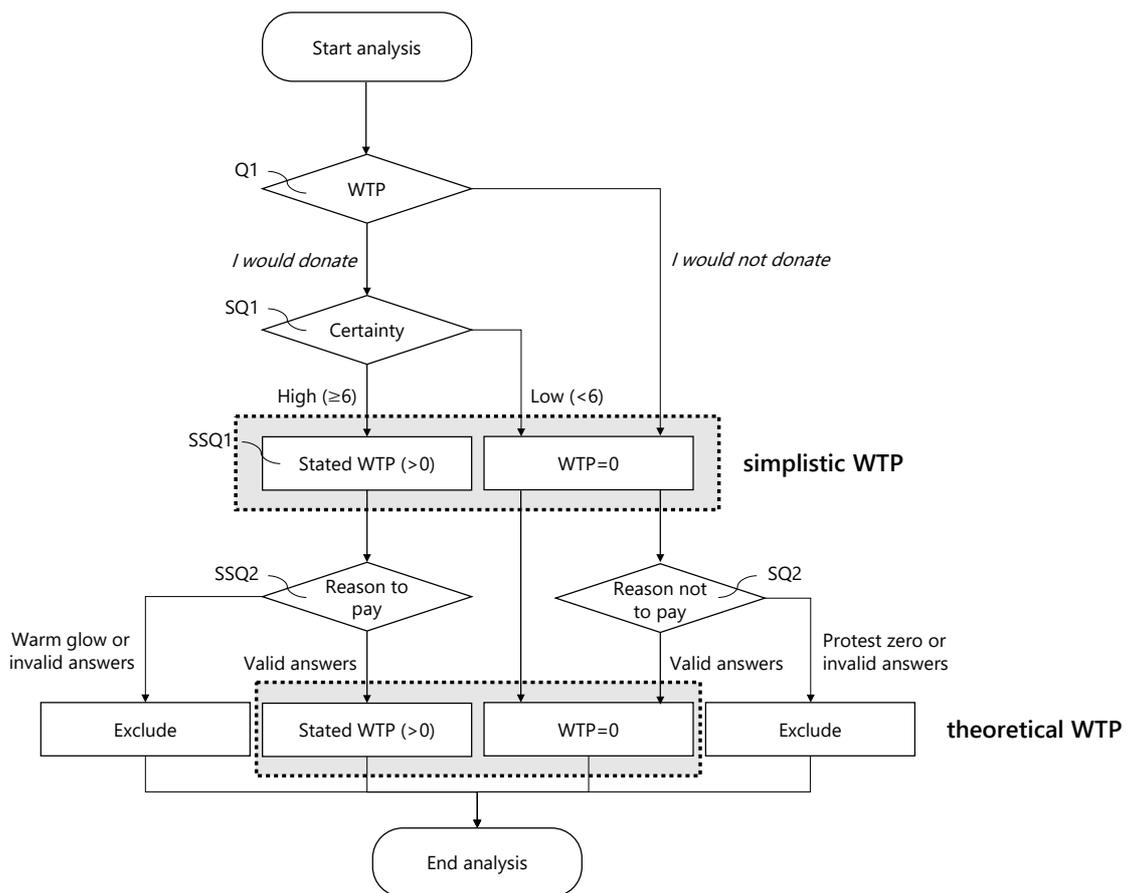
Q refers to question; SQ refers to sub question; SSQ refers to sub sub question; WTP refers to willingness to pay.

4

5   *Figure 2*. Flow chart of the questions asked in the WTP section

6

1 Two types of mean WTP were used in the valuation – the simplistic and

2 theoretical WTP (Figure 2). The simplistic mean WTP was calculated on the basis of

3 positive bids and zero bids by recoding uncertain positive bidders into zero WTP. By

4 contrast, the theoretical WTP expresses the value obtained when accounting for warm

5 glow answers, protest zero bids, unexplained no-bids, and other invalid answers.

6 Weighting adjustments, in terms of age group (18 to 29, 30 to 39, 40 to 49, 50 to 59, 60

7 to 69) and gender, were applied to the theoretical WTP data to ensure a nationally

8 representative sample. The latter could not be calculated for the Finland data due to a

9 procedural error.

10 For purposes of international comparison, the stated WTP values were converted

11 into purchasing power parity (PPP) US$ based on the OECD's conversion rate (OECD,

12 2017). Weighting adjustments for gender and age in CV surveys are particularly

13 vulnerable to outliers because WTP amounts are unbounded at the upper end, and the

14 mean WTP amount is sensitive to outliers (Mitchell & Carson, 1989). We therefore

15 used the 5% trimmed mean as a more robust estimator of WTP, which is consistent with

16 the recommendation of statisticians (Mitchell & Carson, 1989). As data are markedly

17 non-normal, the distribution-free Kruskal-Wallis test was used to compare each nation's

18 WTP.

19 ### 3.4.2. Theoretical validity analysis

20 Two types of regression analyses were used to identify associations between the

21 theoretical WTP and the independent variables outlined above. A logit model was

22 applied since the dependent variable is binary in nature, that is: whether respondents

23 stated a WTP (higher than zero) or not (*WTP01*). In addition to the logistic regression

24 model, a Tobit model was applied to examine factors that determine the stated WTP

25 amount (*§WTP*). The Tobit model was used because of the censored nature of the

18

1 dependent variable (Halstead, Lindsay, & Brown, 1991), that is, there were many

2 respondents with WTP amounts stated as zero. Regression analyses were performed on

3 each country's data as well as the pooled data (including dummy variables), to control

4 for country effects (*UK*, *JPN*, *AUS*). Finland and the Netherlands were reluctantly

5 excluded from the regression analyses: the dependent variables (i.e., theoretical WTP)

6 are not available for Finland (see above); and for the Netherlands the variables outlined

7 above were not included in the survey questionnaire because of limitations of space.

8

9 **4. Empirical results**

10 **4.1. Descriptive statistics**

11 　　Table 3 presents the demographic characteristics of valid respondents from each

12 country. After excluding questionnaires with invalid answers to the key questions,

13 1,507, 1,551, 2,364, 1,233, and 1,690 observations were left for the UK, Japan, the

14 Netherlands, Belgium and Finland respectively. The gender proportion was

15 approximately equal in most countries. The mean age of respondents ranged from 43.2

16 years in the UK to 49.6 years in Finland. Respondents in the UK and Belgium were the

17 least likely (51.0%) to be working full time; whereas the highest score for full time

18 working (67.0%) was found in the Netherlands. The Netherlands had the lowest

19 proportion of respondents who described themselves as married or a couple (43.4%),

20 and Finland had the highest (66.2%). Those with degree level education or above

21 ranged from a low of 31.4% in Belgium to a high of 49.0% in the Netherlands. Only

22 4.5% of the respondents from Belgium reported an annual household income one-and-a-

23 half times higher than the national average compared with 35.1% of respondents from

24 Finland.

A comparison of the demographic distribution of the sample and the national population, using population data from the World Bank, shows that the data is largely representative of the population in terms of its gender composition, however significant differences in the age distribution were identified. This indicated that data may need to be weighted for the sample results to be more fully representative of the populations from which they were drawn.

Table 3.

Demographic characteristics of the respondents

		UK				Japan				Netherlands				Belgium				Finland			
		sample		ref[c]		sample		ref[c]		sample		ref[c]		sample		ref[c]		sample		ref[c]	
		n	%	%	χ^2	n	%	%	χ^2	n	%	%	χ^2	n	%	%	χ^2	n	%	%	χ^2
Gender	Male	736	48.8	49.6	n.s.	775	50.0	50.4	n.s.	1,197	50.6	50.3	n.s.	631	51.2	50.1	n.s.	1,009	59.7	50.3	***
	Female	771	51.2	50.4		776	50.0	49.6		1,167	49.4	49.7		602	48.8	49.9		681	40.3	49.7	
Age[a]	18 - 29	347	23.0	20.6[d]	n.s.	240	15.5	15.8[d]	n.s.	279	11.8	19.2[d]	***	264	21.4	19.4[d]	***	197	11.7	19.3[d]	***
	30 - 39	304	20.2	20.5		303	19.5	19.7		401	17.0	18.2		230	18.7	20.3		263	15.6	19.6	
	40 - 49	316	21.0	21.2		357	23.0	23.0		603	25.5	22.0		252	20.4	21.4		306	18.1	18.8	
	50 - 59	302	20.0	20.5		301	19.4	19.2		541	22.9	21.9		220	17.8	21.6		369	21.8	20.9	
	60 - 69	238	15.8	17.1		350	22.6	22.4		540	22.8	18.7		267	21.7	17.3		555	32.8	21.3	
	M (SD)	43.2 (13.9)				46.0 (13.5)				47.5 (13.3)				44.5 (14.9)				49.6 (14.2)			
Employment status	Full-time worker	769	51.0			793	51.1			1,583	67.0			629	51.0			870	51.5		
	Others	738	49.0			758	48.9			781	33.0			604	49.0			820	48.5		
Marrital status	Married or couple	949	63.0			992	64.0			1,025	43.4			755	61.2			1,119	66.2		
	Others	558	37.0			559	36.0			1,339	56.6			478	38.8			571	33.8		
Educational qualification	Degree level or above	582	38.6			674	43.5			1,158	49.0			387	31.4			746	44.1		
	Others	925	61.4			877	56.5			1,206	51.0			846	68.6			944	55.9		
Annual hosehold income	More than 150% of NA[b]	497	33.0			307	19.8			485	20.5			56	4.5			594	35.1		
	Others	1,010	67.0			1,244	80.2			1,879	79.5			1,177	95.5			1,096	64.9		

[a] Since the legal age of majority is 20 in Japan, the minimum age of the study subjects was restricted to 20 years.

[b] NA indicates national average household income; actual values were displayed in each questionnaire.

[c] Reference numbers from World Bank (2015).

[d] Population composition ratio of 20s is shown.

1   **4.2. WTP results**

2   The upper part of Table 4 presents summary statistics regarding the simplistic

3   WTP scores and the lower part shows the theoretical WTP scores. Regarding the

4   theoretical WTP, the percentage of respondents indicating their willingness to donate

5   with a certainty ranged from 15.1% in Belgium to 35.0% in the UK, that is, in all cases

6   the majority of respondents had zero WTP. The chi-square test indicated that there was

7   a statistically significant difference in the WTP distributions between the countries (χ^2 =

8   225.924, p < 0.001). The residual analysis showed that respondents who reported WTP

9   with certainty were found in higher concentrations in the UK (p < 0.001). The 5%

10   trimmed mean WTP scores were 11.0 (± 21.3) (in $ PPP) for the UK, 5.3 (± 15.7) for

11   Japan, 4.2 (± 13.8) for Belgium, and 2.3 (± 6.4) for the Netherlands. The Kruskal-Wallis

12   test indicates that there is a significant difference in mean rank between countries

13   (Kruskal-Wallis χ^2 = 202.648, p < 0.001). The UK (2259.6) obtained the highest mean

14   rank followed by Japan (1925.8), the Netherlands (1855.4), and Belgium (1807.1).

15   Subsequent pairwise comparisons showed significant differences, with the exception of

16   the Netherlands compared with Belgium. These observations are generally in agreement

17   with the underlying assumption associated with welfare economics that more medals

18   won, equates to more utility derived.

19

20

21

Table 4.

A summary statistics of the WTP

				UK	Japan	Netherlands	Belgium	Finland	p value	Pairwise comparison
Simplistic	WTP[a]									
	I would donate	(certainty≥6)	n (%N)	515 (34.2[+++])	300 (19.3)	257 (10.9[---])	149 (12.1[---])	348 (20.6[-])	< 0.001[c]	
			M[b] (SD)	9.6 (19.0)	4.5 (13.4)	0.7 (2.9)	2.7 (10.7)	8.5 (22.9)		
			Mean rank	4568.0	3902.4	3528.9	3608.0	4018.8	< 0.001[d]	UK>JPN, FIN>NED, BEL
	Zero WTP[a]									
	I would donate	(certainty<6)	n (%N)	143 (9.5[+++])	92 (5.9[+++])	42 (1.8[---])	62 (5.0)	20 (1.2[---])		
	I would not donate		n (%N)	849 (56.3[---])	1,159 (74.7[-])	2,068 (87.4[+++])	1,022 (82.9[+++])	1,322 (78.2)		
Theoretical	WTP[a]									
	I would donate	(certainty≥6)	n (%N)	377 (35.0[+++])	221 (20.2)	204 (17.5[---])	146 (15.1[---])		< 0.001[c]	
			M[b] (SD)	11.0 (21.3)	5.3 (15.7)	2.3 (6.4)	4.2 (13.8)			
			Mean rank	2259.6	1925.8	1855.4	1807.1		< 0.001[d]	UK>JPN>NED, BEL
	Zero WTP[a]									
	I would donate	(certainty<6)	n (%N)	139 (12.9[+++])	92 (8.4)	57 (4.9[---])	78 (8.0)			
	I would not donate		n (%N)	560 (52.0[---])	780 (71.4)	905 (77.6[+++])	746 (76.9[+++])			
	Exclusion									
	I would donate	(warm glow)	n	142	78	19	41			
	I would not donate	(protest zero)	n	286	379	512	580			
	Missing		n	3	1	1,440	8			

[a] Data were weighted for gender and age structure according to national sample structure.

[b] 5% trimmed mean in ppp$.

[c] Chi-square test was applied for nominal variable, i.e. I would donate (certainty≥6); I would donate (certainty<6); I would not donate.

[d] KruskaleWallis test was applied.

[+++(---)] Significantly higher (lower) proportion by residual analysis (p<0.001)

[++(--)] Significantly higher (lower) proportion by residual analysis (p<0.01)

[+(-)] Significantly higher (lower) proportion by residual analysis (p<0.05)

1 **4.3. Theoretical validation of results**

2   Table 5 presents descriptive information for each variable included in the

3 theoretical validity analysis. Significant differences in the proportion of respondents

4 were observed in all variables. The UK sample has a higher percentage of people who

5 watched the Rio 2016 Olympics on TV intensively (i.e., every day or most days)

6 (44.6%), actively consume various types of sports-related activities (i.e., avid sport fan)

7 (38.9%), and score highly for the level of perceived benefits linked to international

8 sporting success (45.9%). The observed frequencies of people who are, or used to be, a

9 participant in competitive sport and who are involved with an organisation that is

10 concerned with elite sport, were also significantly higher in the UK sample. Belgium

11 had the highest proportion of respondents who reported having a low score for the level

12 of risk perception associated with high performance sport (38.5%).

13   Table 6 presents the results of the statistical analysis using the logit and Tobit

14 regressions to investigate the association of willingness to pay with the variables

15 outlined above. The regression models for the entire sample confirm that declaring

16 willingness to pay (*WTP01*) and the stated amount of willingness to pay (*$WTP*) are

17 positively related to: the frequency of watching the Rio 2016 Olympics on TV

18 (*WatchtvRio2016*); being an avid sports fan (*Avidfan*); being a member of the high

19 benefits perception group (*Benefit*); being a member of the low risks perception group

20 (*Risk*); being a participant in competitive sport (*Athlete*); working in elite sport-related

21 sectors (*Organisation*); and the high income group (*Income*). There were mixed results

22 with regards to the gender and age: the effects were statistically significant only in one

23 model. With reference to the country dummy, the significant and positive coefficients in

24 the both models imply that UK citizens (*UK*) value their sporting success more than

other countries. Japanese dummy (*JPN*) also had a significant and positive effect on the WTP in the logit model.

When we focused on country-specific models, the effects of *WatchtvRio2016* and *Avidfan* were statistically significant in most models. *Benefit* showed significant association with the WTP in all models; however the coefficients were, unexpectedly, negative in the Belgium sample. Positive effects of *Risk* (i.e., perceiving low risk) were found in the logit models for UK and Japan cohorts; but the effects were not significant in Belgium. A significant relationship between *Athlete* and WTP was observed in both regressions for the Japanese sample. The coefficients of the variable *Organisation* were positively significant in all models except for the Japanese logit model. *Age* and *Age^2* were significant for Belgium, which suggests a curvilinear relationship between age and WTP in these countries. The income variable was found to have a significant effect in most cases. Overall, the explanatory variables used had the expected effect on WTP, that is; the contingent valuation responses in this study were not random, rather they followed a consistent pattern and thus can be said to be theoretically valid.

Table 5.

Descriptive information of the explanatory variables

		UK		Japan		Belgium		p value
		n	%	n	%	n	%	
Frequency of watching Rio 2016 Olympics on TV	Every day	187	17.4 +++	48	4.4 ---	31	8.3	< 0.001[b]
	Most days	292	27.2 +++	167	15.3 ---	73	19.6	
	Occasionally	398	37.0 ---	628	57.5 +++	174	46.6	
	Not at all	198	18.4 --	249	22.8	95	25.5 ++	
Sports fanship habitus	Avid sports fan	419	38.9 +++	209	19.1 ---	126	33.7	< 0.001[b]
	Involved sports fan	253	23.5 --	335	30.6 +++	76	20.3 --	
	Casual sports fan	278	25.8 ---	430	39.3 +++	113	30.2	
	Non sports fan	126	11.7	119	10.9	59	15.8 -	
Benefits perception of elite sport success	High level ($M \geq 5$)[a]	494	45.9 +++	437	40.0	130	34.8 --	< 0.001[b]
	Moderate or low level	582	54.1 ---	656	60.0	244	65.2 ++	
Risks perception involved in elite sport	Low level ($M \leq 3$)[a]	243	22.6 -	252	23.1	144	38.5 +++	< 0.001[b]
	High or moderate level	833	77.4 +	841	76.9	230	61.5 ---	
I am, or used to be, a participant in competitive sport.	Yes	442	41.1 +++	281	25.7 ---	22	5.9 ---	< 0.001[b]
	No	634	58.9 ---	812	74.3 +++	352	94.1 +++	
Involvement with an organisation that is concerned with elite sport.	Yes	111	10.3 +++	26	2.4 ---	22	5.9	< 0.001[b]
	No	965	89.7 ---	1,067	97.6 +++	352	94.1	

Data were weighted for gender and age structure according to national sample structure.

[a] Cutoff values of Belgium were 4 for benefits and 2 for risks, since 5 point Likert scale was utilised.

[b] Chi-square test was applied.

+++(---) Significantly higher (lower) proportion by residual analysis ($p < 0.001$)

++(--) Significantly higher (lower) proportion by residual analysis ($p < 0.01$)

+(-) Significantly higher (lower) proportion by residual analysis ($p < 0.05$)

26

Table 6.

Results of the logit and Tobit regressions

	Logit model				Tobit model			
	UK	Japan	Belgium	Total	UK	Japan	Belgium	Total
Intercept	-2.795 **	-3.814 ***	-5.946 ***	-3.851 ***	-1098.393 *	-269.3594 ***	-597.556 **	-1073.386 ***
WatchtvRio2016	1.004 ***	0.830 ***	0.738 †	1.022 ***	276.575 **	43.483 **	53.058 n.s.	220.412 *
Avidfan	0.710 ***	0.841 ***	1.627 ***	0.887 ***	224.095 *	58.618 ***	126.999 **	212.633 ***
Benefit	1.934 ***	1.562 ***	-0.710 †	1.403 **	521.269 **	80.003 ***	-64.931 †	300.875 †
Risk	0.548 **	0.536 **	-0.388 n.s.	0.405 *	92.436 n.s.	23.386 *	-41.248 n.s.	62.151 †
Athlete	0.213 n.s.	0.429 *	0.135 n.s.	0.294 **	46.043 n.s.	35.540 *	96.737 n.s.	65.825 ***
Organisation	0.734 *	0.817 n.s.	1.400 **	0.767 ***	170.982 *	54.864 †	126.272 **	157.341 ***
Gender	0.196 n.s.	0.130 n.s.	0.188 n.s.	0.149 ***	-11.243 n.s.	9.830 n.s.	21.266 n.s.	7.923 n.s.
Age	-0.008 n.s.	0.028 n.s.	0.155 *	0.026 n.s.	1.387 n.s.	2.673 n.s.	16.102 *	9.144 †
Age^2	0.000 n.s.	0.000 n.s.	-0.002 †	0.000 n.s.	-0.036 n.s.	-0.025 n.s.	-0.167 *	-0.106 †
Income	0.225 n.s.	0.545 **	1.055 †	0.408 **	118.077 †	29.624 *	98.826 *	118.964 ***
UK				0.504 ***				57.895 ***
JPN				0.292 ***				15.301 n.s.
Observation	1,076	1,093	374	2,543	1,076	1,093	374	2,543
Log likelihood	-473.540	-420.839	-134.063	-1066.571	-3,171.414	-1,595.330	-499.814	-7389.241
Pseudo R^2	0.320	0.235	0.223	0.269	0.04	0.07	0.08	0.04

Data were weighted for gender and age structure according to national sample structure.

Displayed are the coefficients and Tobit β-coefficient (marginal effect on the latent dependent variable)

Clustered-robust standard errors are computed in the pooled models.

n.s.not significant, †<0.1, *p<0.05, **p<0.01, ***p<0.001.

5. Discussion and conclusions

1

2   This study is an important piece of research eliciting the value of elite sporting

3 success across five countries. From a methodological viewpoint, we applied CV

4 techniques to the elite sport policy sector in a transnational setting by examining a

5 hypothetical scenario in which respondents are asked to state their preferences for a

6 given change (-50%) in the quantity of medals won by their nation in the Tokyo 2020

7 Olympics. Theoretically, this study examines the relationship between international

8 competitiveness and WTP for elite sport success among the sample nations. This is the

9 first example of such a study in an international context. In summary, we estimated the

10 public's welfare change induced by the restriction of public good (i.e., Olympic

11 success) in monetary terms, and compared how the values differ on a transnational

12 basis. As a key theoretical contribution, we found that, in line with the theory of welfare

13 economics, more medals won appears to be linked with more utility.

14   Our empirical results show that willingness to pay for elite sport success differs

15 significantly between countries. We highlight that the more successful countries (i.e.,

16 UK and Japan) stated higher WTP (mean rank) than relatively less successful countries

17 (i.e., the Netherlands and Belgium). This finding shows good agreement with the basic

18 assumption of CVM, whereby an individual's utility is a function of the quantity,

19 quality, and costs of goods consumed, indicating that more medals won maybe linked

20 with more utility among the public. Additionally, a reasonable degree of consistency

21 was found in the differences in the number of medals won and the WTP. We therefore

22 believe that it is reasonable to claim that our estimates successfully passed the scope

23 test. However, no differences in people's WTP were found between the Netherlands and

24 Belgium, which is perhaps a surprising finding given that the Netherlands consistently

25 outperforms Belgium in Olympic sport (De Bosscher, De Knop, & van Bottenburg,

28

1   2008) as demonstrated by them winning approximately three times as many medals in

2   the Rio 2016 Olympics. The interpretation should be that people's utility is not only a

3   simple function of quantity and costs of medals, but also an interaction with individual

4   characteristics such as the use of, and attitude towards, the good. This finding needs

5   further exploration in future research.

6   Meanwhile, we need to take a closer look at the fact that Finland's simplistic

7   WTP was relatively higher. In the Finnish survey, we used a scenario in which winning

8   medals will be zero in 2020 because there was only one medal won in Rio 2016. The

9   results obtained in this study may imply that the law of diminishing marginal utility also

10   applies to medal success: a single valuable medal might yield more utility than any

11   subsequent medals (Downward & Dawson, 2000). In the future, it will be necessary to

12   verify the effects of this law using a different type of scope test.

13   Our results indicate a certain level of objection towards donating for elite sport

14   success exists in each sample nation. In all cases, those who were unwilling to pay

15   represent a majority (64.9% to 84.9%). One plausible explanation is the adoption of a

16   certainty scale to tackle the hypothetical bias. Since we identified the respondents

17   'certainly' willing to pay for elite sport success by using a follow up certainty statement

18   calibration technique, the net effect was to increase the proportion of those classed as

19   unwilling to pay. Another possible explanation was that donation as a payment vehicle

20   is known to result in lower WTP (Ivehammar, 2009), because it is an altruistic payment

21   vehicle (Poder & He, 2016) and it could lead to 'free riding', where "someone pays less

22   than a public good is worth to him in the expectation that others will pay enough to

23   provide it nevertheless" (Mitchell & Carson, 1989, p.128). A third alternative

24   explanation is there may be a large proportion of the population who do not enjoy the

1   value of international sporting success even though sporting success is widely viewed as

2   being a public good (Gratton and Taylor, 2010).

3   The validity tests on the regression models were generally consistent with the

4   theoretical expectations. The variables relating to the use of the good (i.e., frequency of

5   watching Rio 2016 Olympics on TV, and sports fanship intensity) had a significant

6   impact on WTP in most models. The positive effect of the consumption variables

7   concur with previous research (e.g., Atkinson et al., 2008; Wicker et al., 2012b). High

8   recognition of the social and personal benefits from sporting success in international

9   competitions and low perception of the negative aspects of elite sport both had a

10   positive influence on the WTP in many cases. This finding is supported in similar

11   research by Funahashi and Mano (2015) which indicated that attitudinal factors (i.e.,

12   perceptions of benefits and risks) were important constructs that explained the value of

13   elite sport policy. The results underline the importance of policymaker intervention

14   bring about attitudinal and behavioural changes among various population groups, if

15   there is a goal to increase the proportion of people who are supportive of elite sport

16   policy. Group factors, such as participation in competitive sport and involvement with

17   elite sport organisations, show mixed results depending on the model used. Since

18   motives for participation in competitive sport or engagement in elite sport-related

19   organisations are diverse, these variables may not be entirely suitable as proxies for

20   expressing the underlying unobservable attitudes towards elite sport success. The

21   positive contribution of income is in accordance with previous studies (e.g., Funahashi

22   & Mano, 2015; Wicker et al., 2012b).

23   The empirical results of this study provide important data on the utility people

24   derive from international sporting success. A high level of public support for elite sport

25   success is one of the resources required for a successful sport system (Houlihan &

30

1   Zheng, 2013). Our demand-side analysis leads to some useful policy implications for

2   governments attempting either, to promote elite sport development, or to make

3   arrangements for elite sport expenditure from public sources while being conscious of

4   the public acceptability of such decisions. The estimation results imply that the value

5   individuals attach to elite sport policy is most likely be maximised if accompanied by

6   interventions to enhance people's perceived benefits of national sporting success, such

7   as a high profile victory parade for Olympic medallists. It is presumed that the extent to

8   which individuals form trust in the key elite sport policy actors and perceive national

9   athletes to be role models is influential in building the perceived benefits of sporting

10   success (Funahashi et al., 2015). Therefore, key actors responsible for high performance

11   sport, namely the National Sports Agency, the National Governing Bodies, the National

12   Olympic Committee, and so on, need to engage with trust management initiatives (e.g.,

13   increased transparency, anti-corruption measures) to ensure sustainable development. In

14   fact, according to PricewaterhouseCoopers (2017) the lack of trust in sports governing

15   bodies is seen as the severest threat facing the sport industry. Another implication

16   worthy of note is that as the study showed that use-of-goods variables significantly

17   influence the value assessment of national sporting success, it is therefore important to

18   increase public accessibility to repetitive consumption of sports (Wicker et al., 2012b).

19   Currently, traditional free-to-air TV viewing continues to decline especially among

20   younger viewers, and non-professionalised sports (i.e., most Olympic sports) will

21   struggle to increase their exposure on television. National Sport Agencies and the Sports

22   Governing Bodies need to be aware of changes in the consumption habits of young

23   people and respond positively to the introduction of new platforms (e.g., apps, digital

24   media, Over The Top distribution, social networks, etc.) that provide sport content to

25   the public. In this regard, the authors propose that National Olympic Committees should

1 proactively promote the Olympic Channel which provides complementary content that

2 will enhance the viewing experience of the Olympic Games throughout an entire

3 Olympiad. Winning many medals is highly effective for increasing the public's value of

4 elite sporting success. However, for as long as policy level developments in isolation do

5 not guarantee success, the recommendation made above, appears, at least in theory, to

6 be a logical course of action.

7   It is important to highlight some limitations and features of our international

8 collaborative study. The first limitation relates to a procedural problem. There was a

9 technical error in the Finland questionnaire regarding the reason why respondents were

10 unwilling to pay, hence protest zero answers were unidentifiable. In some countries, the

11 present CV survey was conducted jointly with a different national survey, and due to

12 limitations of space on the questionnaire, some important factors associated with WTP

13 were not surveyed in the Netherlands. Future research endeavours should avoid such

14 methodological limitations by having clearer protocols to ensure homogeneity of

15 methods. The second limitation, inherent in stated preference techniques, was that

16 children were typically not covered in the CV survey, because they generally lack the

17 independent financial means as well as cognitive ability needed to respond to WTP

18 queries. Since the utility by winning a medal is not limited to adults, we recommend

19 that future research measures the value of elite sport success for children. To do so,

20 according to Freeman et al. (2014), there are three alternatives, but each involves some

21 difficult questions with no easy answers: using values elicited directly from children;

22 using parents' values as a proxy; or using values based on what the adults would have

23 chosen for themselves in childhood. The third limitation to our analysis is that we

24 assume that all medals have equal value. In practice, however, there must be appropriate

25 weights for the value of gold, silver and bronze medals (Saaty, 2010) and also

realisation that culturally some medals are of more value in certain nations than other medals, for example a Judo medal is likely to be more valued in Japan than a Modern Pentathlon medal. The final limitation is that we have not considered the tax-deductibility of the donation. Potential biases might arise from this limitation in the data if the tax treatment of donations of this type varies by jurisdiction.

The nations taking part in this research are a sub set of the nations which took part in the SPLISS 2.0 study and are known to be enthusiastic supporters of elite sport by global standards. Future research should include a more heterogeneous sample of nations, notably: poorer nations; nations without a track record of Olympic success; and nations with different government types other than democracies.

References

Andreoni, J. (1990). Impure altruism and donations to public goods: A theory of warm-glow giving. *The Economic Journal, 100*(401), 464-477.

Atkinson, G., Mourato, S., Szymanski, S., & Ozdemiroglu, E. (2008). Are We Willing to Pay Enough toBack the Bid'?: Valuing the Intangible Impacts of London's Bid to Host the 2012 Summer Olympic Games. *Urban Studies*, *45*(2), 419-444.

Basic Act on Sports (Japan). (2011) Retrieved from www.mext.go.jp/a_menu/sports/kihonhou/attach/1336024.htm

Bateman, I. J., Carson, R. T., Day, B., Hanemann, M., Hanley, N., Hett, T., ... & Swason, J. (2002). *Economic valuation with stated preference techniques: A manual*. Cheltenham: Edward Elgar.

Broadbent, C. D. (2014). Evaluating mitigation and calibration techniques for hypothetical bias in choice experiments. *Journal of Environmental Planning and Management, 57*, 1831-1848.Carson, R. T., Flores, N. E., & Meade, N. F. (2001). Contingent valuation: Controversies and evidence. *Environmental and Resource Economics*, *19*, 173-210.

Castellanos, P., García, J., & Sánchez, J. M. (2011). The willingness to pay to keep a football club in a city: how important are the methodological issues? *Journal of Sports Economics, 12*(4), 464-486.

Cummings, R. G., & Taylor, L. O. (1999). Unbiased value estimates for environmental goods: a cheap talk design for the contingent valuation method. *American Economic Review*, *89*(3), 649-665.

De Bosscher, V., De Knop, P., & van Bottenburg, M. (2008). Sports, culture and society: Why the Netherlands are successful in elite sports and Belgium is not? A comparison of elite sport policies. *Kinesiologia Slovenica, 14*(2): 21-40.

34

1　De Bosscher, V., Sotiriadou, P., & van Bottenburg, M. (2013). Scrutinizing the sport

2　　　pyramid metaphor: an examination of the relationship between elite success and

3　　　mass participation in Flanders. *International Journal of Sport Policy and Politics*,

4　　　*5*(3), 319-339.

5　De Bosscher, V., Shibli, S., Westerbeek, H., & Van Bottenburg, M. (2015). *Successful*

6　　　*elite sport policies: An international comparison of the Sportspolicy Factors*

7　　　*Leading to International Sporting Success (SPLISS 2.0) in 15 nations.* Aachen:

8　　　Meyer & Meyer Sport.

9　Diamond, P. A., & Hausman, J. A. (1993). On contingent valuation measurement of

10　　　nonuse values. In J.A. Hausman (Ed.) Contingent valuation: A critical assessment

11　　　(pp. 3-38). Amsterdam: Elsevier Science.

12　Downward, P., & Dawson, A. (2000). *The economics of professional team sports.*

13　　　*Psychology*. London: Routledge.

14　Freeman III, A. M., Herriges, J. A., & Kling, C. L. (2014). *The measurement of*

15　　　*environmental and resource values: Theory and methods*. Oxon: Routledge.

16　Funahashi, H., De Bosscher, V., & Mano, Y. (2015). Understanding public acceptance

17　　　of elite sport policy in Japan: a structural equation modelling approach. *European*

18　　　*Sport Management Quarterly, 15*(4), 478-504.

19　Funahashi, H., & Mano, Y. (2015). Socio-psychological factors associated with the

20　　　public's willingness to pay for elite sport policy: does risk perception matter?

21　　　*Managing Sport and Leisure*, *20*(2), 77-99.

22　Grammatikopoulou, I., & Olsen, S. B. (2013). Accounting protesting and warm glow

23　　　bidding in Contingent Valuation surveys considering the management of

24　　　environmental goods–An empirical case study assessing the value of protecting a

35

Natura 2000 wetland area in Greece. *Journal of Environmental Management, 130*(30), 232-241.

Gratton, C., & Taylor, P. (2010). Public goods. In R. Bartlett, C. Gratton & C.G. Rolf (Eds.), *Encyclopedia of International Sports Studies* (pp. 1104-1107). Oxon: Routledge.

Grix, J., & Carmichael, F. (2012). Why do governments invest in elite sport? A polemic. *International Journal of Sport Policy and Politics, 4*(1), 73-90.

Halstead, J. M., Lindsay, B. E., & Brown, C. M. (1991). Use of the Tobit model in contingent valuation: experimental evidence from the Pemigewasset Wilderness Area. *Journal of Environmental Management, 33*(1), 79-89.

Haut, J., Grix, J., Brannagan, P. M., & Hilvoorde, I. V. (2017). International prestige through 'sporting success': an evaluation of the evidence. *European Journal for Sport and Society, 14*(4), 311-326.

Heberlein, T. A., Wilson, M. A., Bishop, R. C., & Schaeffer, N. C. (2005). Rethinking the scope test as a criterion for validity in contingent valuation. *Journal of Environmental Economics and Management, 50*(1), 1-22.

Hicks, J. R. (1943). The four consumer's surpluses. *The Review of Economic Studies, 11*(1), 31-41.

HM Government. (2015). *Sporting Future: A New Strategy for an Active Nation.* London: Cabinet Office.

Houlihan, B., & Zheng, J. (2013). The Olympics and elite sport policy: Where will it all end? *The International Journal of the History of Sport, 30*(4), 338-355.

House, R. J., P. Hanges, M. Javidan, P. W. Dorfman, & V. Gupta. (2004). *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies.* Thousand Oaks, CA: Sage.

1   Humphreys, B. R., Johnson, B. K., Mason, D. S., & Whitehead, J. C. (2018). Estimating

2   the value of medal success in the Olympic Games. *Journal of Sports Economics*,

3   *19*(3), 389-416.

4   Ivehammar, P. (2009). The payment vehicle used in CV studies of environmental goods

5   does matter. *Journal of Agricultural and Resource Economics, 34*(3), 450-463.

6   Johnson, B. K., Groothuis, P. A., & Whitehead, J. C. (2001). The value of public goods

7   generated by a major league sports team: The CVM approach. *Journal of Sports*

8   *Economics*, *2*(1), 6-21.

9   Johnson, B. K., & Whitehead, J. C. (2000). Value of public goods from sports stadiums:

10   The CVM approach. *Contemporary Economic Policy*, *18*(1), 48-58.

11 Johnson, B. K., Whitehead, J. C., Mason, D. S., & Walker, G. J. (2007). Willingness to

12   pay for amateur sport and recreation programs. *Contemporary Economic Policy*,

13   *25*(4), 553-564.

14 Johnson, B. K., Whitehead, J. C., Mason, D. S., & Walker, G. J. (2012). Willingness to

15   pay for downtown public goods generated by large, sports-anchored development

16   projects: The CVM approach. *City, Culture and Society, 3*(3), 201-208.

17 Levy, D.P. (2009). Fanship habitus: The consumption of sport in the US. In K. Robson

18   & C. Sanders (Eds), *Quantifying Theory: Pierre Bourdieu* (pp. 187-199).

19   Dordrecht: Springer.

20 Lindhjem, H., & Navrud, S. (2011). Are Internet surveys an alternative to face-to-face

21   interviews in contingent valuation? *Ecological Economics*, *70*(9), 1628-1637.

22 Mitchell, R. C., & Carson, R. T. (1989). Using surveys to value public goods: the

23   contingent valuation method. Washington, D.C.: Resources for the Future.

Mitchell, H., Spong, H., & Stewart, M. (2012). Gambling with Public Money: An Economic Analysis of National Sports Team Funding. *The Economic and Labour Relations Review, 23*(2), 7-22.

OECD. (2017). Purchasing power parities (PPP). Retrieved from https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm

Olsen, J. A., Donaldson, C., & Pereira, J. (2004). The insensitivity of 'willingness-to-pay' to the size of the good: New evidence for health care. *Journal of Economic Psychology*, *25*(4), 445-460.

Orlowski, J., & Wicker, P. (2016). The monetary Value of voluntary coaching: An output-based approach. *International Journal of Sport Finance, 11*(4), 310-326.

Park, J. W., Lim, S. Y., & Bretherton, P. (2012). Exploring the truth: A critical approach to the success of Korean elite sport. *Journal of Sport and Social Issues*, *36*(3), 245-267.

Poder, T. G., & He, J. (2016). Willingness to pay and the sensitivity of willingness to pay for interdisciplinary musculoskeletal clinics: a contingent valuation study in Quebec, Canada. *International Journal of Health Economics and Management, 16*(4), 337-361.

Poe, G. L., Clark, J. E., Rondeau, D., & Schulze, W. D. (2002). Provision point mechanisms and field validity tests of contingent valuation. *Environmental and Resource Economics*, *23*(1), 105-131.

Pricewaterhouse Coopers. (2017). *Sports: The most disrupted of all industries? PwC's Sports Surveys 2017.*

Saaty, T. L. (2010). Who won the Winter 2010 Olympics? A quest into priorities and rankings. *Journal of Multi-criteria Decision Analysis, 17*(1-2), 25-36.

1   Stewart, B., Nicholson, M., Smith, A., & Westerbeek, H. (2004). *Australian sport–*

2   *better by design?: the evolution of Australian sport policy*. Oxon: Routledge.

3   Vekeman, A., Meulders, M., Praet, A., Colpaert, J., & Van Puyenbroeck, T. (2015).

4   Contingent valuation of a classic cycling race. *Journal of Sports Economics*, *16*(3),

5   268-294.

6   Volkwein, K. A. (1995). Ethics and top-level sport-a paradox? *International Review for*

7   *the Sociology of Sport*, *30*(3-4), 311-320.

8   Walker, M., & Mondello, M. J. (2007). Moving beyond economic impact: A closer look

9   at the contingent valuation method. *International Journal of Sport Finance*, *2*(3),

10   149-160.

11   Walton, H., Longo, A., & Dawson, P. (2008). A contingent valuation of the 2012

12   London Olympic Games: A regional perspective. *Journal of Sports Economics*,

13   *9*(3), 304-317.

14   Whitehead, J. C., & Blomquist, G. C. (2006). The use of contingent valuation in

15   benefit-cost analysis. In A. Alberini & J.R. Kahn (Eds.), *Handbook on Contingent*

16   *Valuation* (pp. 92-115). Cheltenham: Edward Elgar.

17   Whitehead, J. C. (2014). Contingent valuation. In T.C. Haab & J.C. Whitehead (Eds.),

18   *Environmental and Natural Resource Economics: An Encyclopedia* (pp. 89-92).

19   Santa Barbara, CA: Greenwood.

20   Whitehead, J. C., & Wicker, P. (2018). Estimating willingness to pay for a cycling event

21   using a willingness to travel approach. *Tourism Management*, *65*, 160-169.

22   Wicker, P., Hallmann, K., Breuer, C., & Feiler, S. (2012). The value of Olympic

23   success and the intangible effects of sport events–a contingent valuation approach

24   in Germany. *European Sport Management Quarterly*, *12*(4), 337-355.

1   Wicker, P., Prinz, J., & von Hanau, T. (2012). Estimating the value of national sporting

2   success. *Sport Management Review*, *15*(2), 200-210.

3   Wicker, P., Whitehead, J. C., Mason, D. S., & Johnson, B. K. (2017). Public support for

4   hosting the Olympic Summer Games in Germany: The CVM approach. *Urban*

5   *Studies*, *54*(15), 3597-3614.

6   World Bank. (n.d.) *World Bank Open Data.* Retrieved from https://data.worldbank.org/

7