

## **RUNNING A GREENER RACE: WILLINGNESS-TO-PAY EVIDENCE FROM THE OLD MUTUAL TWO OCEANS MARATHON IN SOUTH AFRICA**

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### **ABSTRACT**

*Environmentally and socially responsible leisure activity has become a key issue in tourism development. Service providers are keen to promote their environmental sustainability credentials and people are starting to pay for carbon offsets and “green” certified facilities. However, compared to doing business as usual, greener operations often imply large capital investments and higher operating costs. There are numerous studies on the importance of environmentally sustainable tourism, on tourists who indicate that environmental sustainability is important to them and on the positive impacts that it may have on development. This paper aims to make a contribution to the literature on whether people are willing to pay for greener products and services, by extending the scope to the Two Oceans Marathon in Cape Town, South Africa in 2011 where a survey was conducted. The focus was on the characteristics of the runners who were willing to pay for a sustainable event and the results show that there were differences between the willingness to pay of different groupings of runners. Participants who were older and those who were self-employed were more likely to be greener. Education levels do not seem to matter, but feeling responsible for climate change does.*

**Key words:** Environmental sustainability; Sport events; Two Oceans Marathon; Willingness to pay; Climate change mitigation; South Africa.

### **INTRODUCTION**

Climate change is happening and there exists a unique link between the environment and our leisure activities. Tourism involves travel, which is an important source of greenhouse gas emissions. Although climate change is a significant concern and there is increasing consensus that everyone needs to act together now, it is not always clear that polluters and policy-makers are ready to take the necessary steps to address the challenge. For example, an article in *The Economist* (2011), reported that a proposal to renewably generate 20% of electricity at the Olympic site in London seems to have been abandoned. It is argued that this highlights a broader concern about energy and policy. The development and use of renewable and alternative energy is typically hampered by uncertainty about the future price of energy and the price of carbon, as well as the return on long-term investments. The Olympic Games provided such a longer term and investment was assured, but it seems that early promises

may not be kept. If the suppliers of leisure activities and organisers of major sport and cultural events regard sustainable projects as too expensive, the other side of the coin is that the travelling public may not be willing to pay for a “greener” and more sustainable tourism experience, which is the topic of investigation in this paper.

International academic literature (but there is little in South Africa) exists on aspects of the environment, climate change and tourism. An analysis of the links between tourism and climate change can be grouped into four categories (Fisher, 2007), namely (1) the impact of tourism on climate change, (2) the impact of climate change on tourism, (3) adaptation to climate change, and (4) mitigation of climate change. In this last category, studies of the mitigation of climate change, specifically of willingness to pay, have focused on air travellers’ willingness to pay for carbon offsets (Brouwer *et al.*, 2008), or tourists’ willingness to contribute to funds for the management and conservation of a particular natural resource (Casey *et al.*, 2010).

This paper falls in the last category on mitigation of climate change and takes the question of the environment and climate change to a sport event to ask: Are runners willing to pay for a “greener” marathon? What are the characteristics of these athletes? The Old Mutual Two Oceans Marathon is a major event on the running calendar, and in 2011, it attracted 23 000 participants. Most of the participants fly or drive significant distances to participate and spend a number of days in and around Cape Town as tourists. In order to examine whether the runners are willing to pay to compensate for their carbon footprint in the race, a survey was conducted at the marathon. In total, 502 athletes participated in the survey and data were collected about their demographics, spending and the key question: “Would you be willing to pay more for a more environmentally friendly marathon?” (This question was answered by 447 runners.) Based on their characteristics, an online carbon calculator shows that the carbon footprint of the average participant is approximately 150kg of CO<sub>2</sub>, which can be offset with approximately 1.2 trees ([www.trees.co.za](http://www.trees.co.za)).

The paper is organised as follows. Section 2 provides a review of willingness-to-pay studies linked to the mitigation of climate change. Section 3 provides some background to the marathon and a description of the data collected in the survey. Section 4 presents two regression models of the predictors of willingness to pay, and finally the conclusions and recommendations are presented.

## LITERATURE REVIEW

Dubois and Ceron (2006) and Patterson *et al.* (2006) provide reviews of the literature on the environment, climate change and tourism. The aim of this brief overview is two-fold: the first is to explain why it is difficult to determine the price of pollution and the value that people place on a sustainable environment; the second is to review the methods that are typically used to determine their willingness to pay and a number of examples from the literature that have applied these methods.

### Environment as a common pool resource

Many natural resources are private goods that are rival and excludable in consumption and have clear property rights. Global warming and climate change involve aspects of the natural

environment, which economists refer to as common good characteristics, or non-market resource characteristics. The earth's atmosphere and the climate are utilised by all. No one has to pay to live on earth! As a consequence, the environment suffers the effects of negative externalities, specifically the pollution that occurs during all the production and consumption activities. Within the context of this paper, this would, for example, be the pollution that occurs during a flight from Johannesburg to Cape Town to participate in the Two Oceans Marathon. The private cost of the flight to the airline and the individual athlete is clear and represented by the price of the ticket. The CO<sub>2</sub> pollution that occurs during the flight contributes to global warming and climate change and presents a cost to society. The externality is the difference between the private and social costs. The market fails to account for the social costs since no one owns their share of a sustainable environment to sell to polluters and as such no market or price exists. The result is the "tragedy of the commons", whereby the common pool resource is depleted (Black *et al.*, 2010). People are all deriving utility from the environment at a rate that is unsustainable.

Are there any solutions? It is not possible to stop tourism or sport events to reduce the related pollution to zero, but there may be solutions in cooperation or coercion (Black *et al.*, 2010). Everyone could work together and cooperate to reduce our consumption and the consequent pollution to sustainable levels. This may mean participating only in local marathons and running with recycled socks! This is an unlikely global solution as cooperation will be undermined by the dynamics of the so-called "prisoners' dilemma". Everyone will suspect that everyone else will continue consuming and polluting and they will do so themselves. Similarly, a user-pays approach may be possible, but will be limited to voluntary contributions.

Since no one owns the environment, it is not clear to whom payments should be made when polluting. In the case of voluntary purchases of carbon credits, the payments may go towards forestry programmes that capture carbon. The alternative to cooperation is coercion. Government may sell pollution rights if they are able to set carbon caps, measure pollution levels, link it to the polluters and fine those that do not cooperate. Such cap-and-trade systems, along with carbon credits, are already functioning on a limited scale. Along with the creation of a carbon market, government may also levy carbon taxes on polluters. There are also a number of examples, but again it depends on the ability of the government to measure the pollution, link it to the polluters, set the tax rate and enforce it. Both the cap-and-trade system and carbon taxes also suffer from the above cooperation problem, but at a country level. If all governments believe that all the others will allow pollution, they will not create carbon markets or set carbon taxes. The limitations of climate summits attest to this. The biggest polluters are unwilling to agree to carbon limits, or they set low targets. This was again demonstrated at the COP-17 Summit held in Durban in 2011 (Anon, 2011).

Practically speaking, the effects of human activity on the environment, also our tourism activities, will have to be mitigated by a combination of voluntary contributions and compulsory taxes. Tourism research into the mitigation of climate change has focused on tourists' willingness to pay for carbon offsets, or tourists' willingness to contribute to a fund for the management and conservation of a particular natural resource. The following sub-section provides an overview of recent contributions.

### **Willingness to pay for climate change mitigation**

To determine how much people are willing to pay to mitigate the environmental impact of their travel and tourism activities, three different approaches have been used.

One possibility is the so-called travel cost method. This method is often used to estimate the value of a protected recreational site such as a park or a beach and the impact of changes in access costs or environmental quality. The principle is that the value of a conservation service is reflected in how much individuals are willing to pay to get to the tourist destination. Surveys are used to determine individuals' place of residence, the distance to the destination, the frequency of visits and their demographic characteristics. Differences in the number of visits and travel costs are used to determine the willingness to pay for conservation at different sites (King & Mazzotta, 2000). Hakim (2010) provides an example of the use of this method to determine the economic value of parks in Indonesia. Within the South African context, Du Preez *et al.* (2011) applied the travel cost method to estimate a random utility model of the recreational value of beaches in the Nelson Mandela Bay area. This approach is useful when one is interested in a particular area, but it is limited when the concern is with global warming and climate change.

A second approach is the hedonic pricing method. This approach is useful where individuals are already paying an entrance fee and one is interested in identifying the conservation premium associated with a protected recreational site. The approach holds that every tourism experience, such as visiting a park, has a range of characteristics. Some are easy to identify, to determine the cost and set a price, such as the roads or amenities. Other characteristics of the experience, such as the ability to view game in their natural habitat, are more difficult to quantify, but nevertheless part of the utility that the visitor receives and is willing to pay. With the hedonic pricing method, one does not need to ask visitors how much they are willing to pay. It is possible to observe their spending and use differences in the characteristics of tourism experiences to estimate a conservation premium (King & Mazzotta, 2000). Livengood (1983) used this approach with hunting leases and the demand for wildlife stocks. The approach is useful when one is interested in a particular environmental aspect, but it is limited when the concern is with global warming and climate change.

The third approach is most appropriate when one is interested in people's willingness to pay for climate change mitigation and is called the contingent valuation method (CVM). In this approach, respondents in a survey are presented with a scenario about, for example, climate change and asked about their willingness to pay for offsets. The payment is hypothetical and the valuation is contingent on the scenario that is presented. Guidelines for this approach (Arrow *et al.*, 1993) are outlined in the Report to the National Oceanic and Atmospheric Administration (NOAA) Panel on Contingent Valuation. The CV methods can employ open-ended questions, dichotomous choices, payment cards or bidding games (Anderson, 2010). Open-ended questions specifically ask respondents how much they are willing to pay for common non-market resources. Dichotomous choice methods include a single value of payment that can either be accepted or rejected by respondents (Anderson, 2010). Where payment cards are used, values of hypothetical payments are printed and respondents are asked how close the values are to the maximum amount that they are willing to pay for non-market resources.

In bidding games, hypothetical payments for common resources can be stacked in ascending or descending order until the respondent rejects or accepts a value (Anderson, 2010). Studies on the willingness to pay for climate change mitigation rely on the assessment of scenarios and therefore the CV methods are used in most cases (Johnson & Nemet, 2010). Examples of such studies include those that take a more general approach to willingness to pay for climate change mitigation, those that consider the carbon footprint of tourism and tourists' willingness to pay for carbon offsets, studies that focus specifically on air travel passengers and their CO<sub>2</sub> emissions, and studies that examine tourists' willingness to pay for specific environmental goods.

Johnson and Nemet (2010), provide a general review of studies examining willingness to pay for policy on climate, drawing on 27 different surveys conducted between 1998 and 2010. They found a range of willingness to pay estimates across the different studies from \$22 to \$437 per household annually, with a median of \$135. Common explanatory variables include measures of environmental engagement, environmental attitudes or beliefs, education level, the perceived efficacy of intervention strategies, political views and the level of certainty about climate change and policy outcomes and even the perceptions of others' efforts.

McKercher *et al.* (2010) examine the attitudes of Hong Kong residents towards tourism and the environment, and the willingness of these residents to modify their behaviours in response to climate change. The specific objectives of the research were: (1) to identify specific traveller segments based on frequency and destination of travel as a basis to investigate issues of climate change and travel habits; (2) to identify the level of concerns felt by Hong Kong residents towards climate change; and (3) to identify whether concerns about climate change has caused Hong Kong residents to make voluntary changes to their travel habits. A phone survey was conducted and followed by cluster analysis to identify types of tourists based on their travel propensity, intensity and their style of accommodation. Their results identified four groups: the regular international tourists; active tourists; regional China tourists; and those who are the least travel active. The regular international travellers were most aware of their environmental impact, but also least likely to change their behaviour. Only 23% indicated that they would travel less by plane to reduce their carbon footprint. Approximately 59% indicated that they would prefer to make a voluntary payment rather than pay a mandatory tax.

When the focus is specifically on air travellers' willingness-to-pay to offset their CO<sub>2</sub> emissions, there are a number of contributions to the literature. Brouwer *et al.* (2008) surveyed passengers at Amsterdam's Schiphol airport and found that the mean willingness to pay was €23 per flight. This willingness to pay is significantly influenced by disposable income, frequency of flying and whether they are taking continental flights (where alternative transport is available). There was also a positive and significant relationship with travellers' perceptions of their responsibility for climate change and the effectiveness of the proposed carbon travel tax. Further work by Frew and Winter (2008) examined airlines' websites to see how customers are facilitated to buy carbon offsets from their flights. Gossling *et al.* (2007) reviewed industry discourses on tourism and air travel, and Eisenkopf and Knorr (2008) provided a critical assessment of voluntary carbon offsets looking at the voluntary carbon market, the calculation of carbon footprints and the quality of offset projects.

A final example of tourists' willingness to pay for specific environmental goods comes from Casey *et al.* (2010), who examined tourists' willingness to pay additional fees to protect the coral reefs that they were visiting in Mexico. This payment would be towards a fund to enhance coral reef protection at the Riviera Maya. They surveyed 400 tourists and estimated a probit model of willingness to pay or not. They found willingness-to-pay values that ranged from \$42 to \$58 and a number of possible predictors of willingness-to-pay. They found that respondents who support direct-use fees are willing to pay slightly more to the coral protection trust.

In summary, it can be said that there is an ever-growing volume of literature that explores the links between the environment, climate change and tourism. There are further contributions that examine the impact of tourism on climate change (Dwyer *et al.*, 2010), the impact of climate change on tourism (Pham *et al.*, 2010), adaptation to climate change (Claver-Cortez *et al.*, 2007) and other that identify environmentally friendly tourists (Dolnicar *et al.*, 2008). To the best of our knowledge, no one has taken the questions of the environment, climate change and willingness to pay for mitigation to an event. The following section describes the data collected at the 2011 Two Oceans Marathon and athletes' responses to the question: "Would you be willing to pay more for a more environmentally friendly marathon?"

## DESCRIPTIVE ANALYSIS

The Old Mutual Two Oceans Marathon is an annual marathon race held in Cape Town in the Western Cape Province of South Africa on the Saturday of Easter Weekend. The first race was held in 1970 and 26 runners participated. Since then, the race has become an institution in the race calendar and a favourite of Capetonians, other South Africans and international athletes. The race comprises an ultra-marathon (56km) and half-marathon (21.1km). The 41<sup>st</sup> race took place on 23 April 2011. A record number of 23 000 runners lined up for the marathon in 2011, with 14 000 runners competing in the half-marathon and 9 000 in the ultra-marathon.

To examine the characteristics of the athletes and their willingness to pay for a more sustainable marathon, a survey was conducted on 22 April 2011, by means of a structured questionnaire. The questionnaire was developed based on the work of Casey *et al.* (2010). The questionnaire comprised demographic, behavioural and expenditure questions. The runners surveyed were selected on a next-to-pass basis. A total of 502 completed questionnaires (N=502) were used for the purpose of this paper. Of these, 55 skipped the willingness-to-pay question.

The first step in the analysis is to describe the data. Approximately 63% of the respondents in the survey were male, and 35% were female. The ages of the respondents varied between 18 and 69 years, but the average age was 38 years with a standard deviation of 12 years. The majority of these athletes were English-speaking (57%). Approximately 26% said that they were Afrikaans-speaking and the other 14% indicated that they spoke another home language. In terms of education, a quarter of the respondents had a Grade 12 high school qualification; approximately 32% also had a diploma or degree and 23% held a post-graduate qualification. There were 12% of the athletes who had a professional qualification. The occupations match these high levels of education. There were only four professional athletes in the sample. The

majority of the respondents (27%) indicated that they held professional positions, almost 15% were in management and 13% were self-employed. Students, technical and administrative occupations were also significant parts of the occupation demographics. Of the 502 respondents, most (41%) were from the Western Cape Province and 28% were from Gauteng. The third largest group were from KwaZulu-Natal (6.4%), followed by runners from outside South Africa (5.6%). Approximately 35% of the runners indicated that they were local residents and were like “day-trippers” to the race. The rest mainly stayed over with family of friends (18.5%), in a guesthouse or B&B (15.5%) or at hotels (12.7%).

To examine the issue of the environment, climate change and the runners’ willingness to pay for climate change mitigation, the questionnaire posed the following scenario: Suppose that an additional fee was introduced and added to the race entrance fee to reduce climate change. This fee would contribute to a fund managed by an independent organisation that plants trees to compensate for your contribution to climate change. Taking this into consideration, the respondents were asked to answer the following questions:

1. Would you be willing to pay such a fee in principal to compensate for your contribution to the emission of CO<sub>2</sub> and therefore climate change? (Yes/No)
2. If you are not willing to pay, please indicate why (and they were given 5 possible reasons and an “other” option), and
3. What are the most important reason(s) why you would be willing to pay (and they were given 8 possible reasons and an “other” option)?

Of the 502 respondents, 11% skipped the willingness-to-pay question. Another 27% indicated that they were not willing to pay such an additional fee and 62% said that they would. Respondents who were willing to pay in principle were subsequently asked whether they were willing to pay a specific amount of money. They were reminded to keep their budget constraint in mind and consider the payment relative to the race entrance fee. A start bid of R30 was made and depending on their reply (Yes/No), they were asked for their willingness to pay for a second follow-up bid to which they could again answer either ‘Yes’ or ‘No’. If respondents answered ‘No’ (‘Yes’) to the start bid, the follow-up bid was a lower (higher) amount. This is referred to as a double-bounded (DB) dichotomous choice contingent valuation question and follows the approach of Brouwer *et al.* (2008).

This procedure yields an interval willingness-to-pay value for each individual respondent. One should note that the bid amounts were small – R10, R30 and R50. The cost of offsetting only the CO<sub>2</sub> pollution of a domestic return flight is approximately R90 ([www.trees.co.za](http://www.trees.co.za)). This can be seen in comparison with the race fees: South African runners who own a timing chip paid R180 otherwise the fee was R285. The fees for other African entrants and overseas entrants were considerably higher. Approximately 22% of runners indicated that they were willing to pay the R10, 12% were willing to pay R30 and 19% were willing to pay R50. The runners were also asked to name the maximum amount that they were willing to pay over and above the race registration fee. Almost 40% did not answer the question and, for the remaining 60%, the mean amount was R83.

The focus of this paper was not to calculate an aggregate Rand amount for willingness-to-pay, but rather to shed light on which athletes would be willing to pay. Such Rand value estimates (often in the hypothetical millions) depend strongly on the contingency described, bid amounts and characteristics of the sample, provide little insight to organisers of events. Instead, the focus is on the characteristics of those who are willing to pay in order to identify and engage such runners. Table 1 presents cross-tabulations of the willingness-to-pay groupings and according to the gender and age group variables.

**TABLE 1: CROSS-TABULATION OF WTP AND GENDER AND AGE GROUPS**

Variables			Willing to pay to mitigate climate change			Total
			Skipped	No	Yes	
Gender	Skipped	Count	<b>2</b>	<b>0</b>	<b>5</b>	<b>7</b>
		% within gender	29%	0%	71%	100%
		% WTP	4%	0%	2%	1%
	Male	Count	<b>35</b>	<b>99</b>	<b>185</b>	<b>319</b>
		% within gender	11%	31%	58%	100%
		% WTP	64%	73%	59%	64%
	Female	Count	<b>18</b>	<b>36</b>	<b>122</b>	<b>176</b>
		% within gender	10%	20%	69%	100%
		% WTP	33%	27%	39%	35%
Age groups	18-30 years	Count	<b>12</b>	<b>31</b>	<b>69</b>	<b>112</b>
		% within age gr.	11%	28%	62%	100%
		% WTP	24%	23%	23%	23%
	31-40 years	Count	<b>17</b>	<b>46</b>	<b>105</b>	<b>168</b>
		% within age gr.	10%	27%	63%	100%
		% WTP	35%	35%	34%	34%
	41-50 years	Count	<b>12</b>	<b>35</b>	<b>91</b>	<b>138</b>
		% within age gr.	9%	25%	66%	100%
		% WTP	24%	26%	30%	28%
	51-60 years	Count	<b>6</b>	<b>17</b>	<b>26</b>	<b>49</b>
		% within age gr.	12%	35%	53%	100%
		% WTP	12%	13%	8%	10%
	61 years and older	Count	<b>2</b>	<b>4</b>	<b>15</b>	<b>21</b>
		% within age gr.	10%	19%	71%	100%
		% WTP	4%	3%	5%	4%

WTP= Willing To Pay

Table 1 shows that there is a clear gender difference in the willingness to pay for climate change mitigation. Among the men, 58% indicated that they were willing to pay, whereas 31% were not and 11% skipped the question. In comparison, 69% of women said that they were willing to pay, while 20% said that they were not, and 10% skipped the question. Among the different age groups, the runners in the age groups 18 to 30 years, 31 to 40 years and 41 to 50 years (between 62% and 66%) were willing to pay to mitigate their climate change impacts. There was a difference for the group aged 51 to 60 years, where only 53% indicated that they were willing to pay. International studies have found that older people are

more likely to be willing to pay (Johnson & Nemet, 2010). Among the respondents aged 61 years and older, 71% were willing to pay.

Table 2 shows a cross-tabulation of the willingness to pay for climate change mitigation with marital status and home language. There was little variation in willingness to pay between the differences in marital status. A slightly greater percentage of runners who were single or divorced were willing to pay, compared to those who were married. Among the different language groups, a greater percentage of Afrikaans speakers (64%), than English speakers (61%) were willing to pay. Of the runners who indicated that they speak another home language, 65% indicated that they would be willing to pay. Unfortunately, the survey did not distinguish between other indigenous and other foreign languages.

**TABLE 2: CROSS-TABULATION OF WTP AND MARITAL STATUS AND AGE GROUPS**

Variables			Willing to pay to mitigate climate change			Total
			Skipped	No	Yes	
Marital status	Skipped	Count	<b>27</b>	<b>2</b>	<b>4</b>	<b>33</b>
		% within marital status	82%	6%	12%	100%
		% WTP	49%	1%	1%	7%
	Married	Count	<b>21</b>	<b>82</b>	<b>179</b>	<b>282</b>
		% within marital status	7%	29%	63%	100%
		% WTP	38%	61%	57%	56%
	Not married	Count	<b>6</b>	<b>40</b>	<b>97</b>	<b>143</b>
		% within marital status	4%	28%	68%	100%
		% WTP	11%	30%	31%	28%
	Divorced	Count	<b>1</b>	<b>7</b>	<b>18</b>	<b>26</b>
		% within marital status	4%	27%	69%	100%
		% WTP	2%	5%	6%	5%
	Widow/er	Count	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
		% within marital status	0%	0%	100%	100%
		% WTP	0%	0%	1%	1%
Living together	Count	<b>0</b>	<b>4</b>	<b>11</b>	<b>15</b>	
	% within marital status	0%	27%	73%	100%	
	% WTP	0%	3%	4%	3%	
Home language	Skipped	Count	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>
		% within language	33%	33%	33%	100%
		% WTP	2%	1%	0%	1%
	Afrikaans	Count	<b>12</b>	<b>37</b>	<b>86</b>	<b>135</b>
		% within language	9%	27%	64%	100%
		% WTP	22%	27%	28%	27%
	English	Count	<b>32</b>	<b>81</b>	<b>177</b>	<b>290</b>
		% within language	11%	28%	61%	100%
		% WTP	58%	60%	57%	58%
	Other	Count	<b>10</b>	<b>16</b>	<b>48</b>	<b>74</b>
		% within language	14%	22%	65%	100%
		% WTP	18%	12%	15%	15%

Table 3 presents a cross-tabulation of willingness to pay and education levels. The review by Johnson and Nemet (2010) shows that education levels have been found as a significant determinant of willingness to pay for mitigation change. The marathon sample also indicated

differences. Table 3 shows that 50% of the runners who indicated that they have no schooling also indicated that they were willing to pay for climate change mitigation. Of those with a matric/Grade 12-level qualification, 59% were willing to pay. More of the athletes who had a degree or diploma (69%) or post-graduate qualification (66%) were willing to pay. A proportions test shows that the differences between the respondents that were willing to pay and those that were not are significant. Within the group that were willing to pay the differences between the different education groups were not significant at the 5% level. Interestingly, only 55% of those with professional qualifications were willing to pay to mitigate their impact on the environment. Further cross-tabulations showed that these professionals were mostly males, married and English-speaking. They were from the Gauteng and Western Cape Provinces and on average had the highest total spending at the race. It is possible that they may be able to pay, but were not willing to since they feel they were already incurring substantial expenses.

**TABLE 3: CROSS-TABULATION OF WTP AND LEVEL OF EDUCATION**

Variables			Willing to pay to mitigate climate change			Total
			Skipped	No	Yes	
Level of education	Skipped	Count	<b>8</b>	<b>4</b>	<b>5</b>	<b>17</b>
		% within education	47%	24%	29%	100%
		% WTP	15%	3%	2%	3%
	No schooling	Count	<b>4</b>	<b>1</b>	<b>5</b>	<b>10</b>
		% within education	40%	10%	50%	100%
		% WTP	7%	1%	2%	2%
	Matric	Count	<b>13</b>	<b>37</b>	<b>71</b>	<b>121</b>
		% within education	11%	31%	59%	100%
		% WTP	24%	27%	23%	24%
	Diploma/degree	Count	<b>9</b>	<b>42</b>	<b>112</b>	<b>163</b>
		% within education	6%	26%	69%	100%
		% WTP	16%	31%	36%	32%
	Post-graduate	Count	<b>11</b>	<b>30</b>	<b>78</b>	<b>119</b>
		% within education	9%	25%	66%	100%
		% WTP	20%	22%	25%	24%
	Professional	Count	<b>9</b>	<b>20</b>	<b>36</b>	<b>65</b>
		% within education	14%	31%	55%	100%
		% WTP	16%	15%	12%	13%
	Other	Count	<b>1</b>	<b>1</b>	<b>5</b>	<b>7</b>
		% within education	14%	14%	71%	100%
		% WTP	2%	1%	2%	1%

In Table 4, the willingness to pay and occupation groups are cross-tabulated. The percentage of runners who were willing to pay to mitigate their impact on the environment were 64% for students, 63% for educators, 62% for professionals, 62% for those in administration, 61% for those in sales and 60% for managers. Notable differences that showed up were with the percentages of civil servants (54%) and pensioners (45%) who were willing to pay compared to the aforementioned groups. On the other side of the distribution, 72% of the self-employed

runners were willing to contribute. Three out of the 4 professional athletes were willing to pay.

**TABLE 4: CROSS-TABULATION OF WTP AND OCCUPATION**

Variables			Willing to pay to mitigate climate change			Total
			Skipped	No	Yes	
Occupation (Occup.)	Skipped	Count	<b>4</b>	<b>1</b>	<b>4</b>	<b>9</b>
		% within occup.	44%	11%	44%	100%
		% WTP	7%	1%	1%	2%
Professional	Professional	Count	<b>11</b>	<b>44</b>	<b>83</b>	<b>138</b>
		% within occup.	8%	32%	60%	100%
		% WTP	20%	33%	27%	27%
Management	Management	Count	<b>8</b>	<b>20</b>	<b>46</b>	<b>74</b>
		% within occup.	11%	27%	62%	100%
		% WTP	15%	15%	15%	15%
Self-employed	Self-employed	Count	<b>7</b>	<b>11</b>	<b>47</b>	<b>65</b>
		% within occup.	11%	17%	72%	100%
		% WTP	13%	8%	15%	13%
Technical	Technical	Count	<b>3</b>	<b>9</b>	<b>26</b>	<b>38</b>
		% within occup.	8%	24%	68%	100%
		% WTP	5%	7%	8%	8%
Sales	Sales	Count	<b>5</b>	<b>4</b>	<b>14</b>	<b>23</b>
		% within occup.	22%	17%	61%	100%
		% WTP	9%	3%	4%	5%
Administrative	Administrative	Count	<b>3</b>	<b>10</b>	<b>21</b>	<b>34</b>
		% within occup.	9%	29%	62%	100%
		% WTP	5%	7%	7%	7%
Civil service	Civil service	Count	<b>1</b>	<b>5</b>	<b>7</b>	<b>13</b>
		% within occup.	8%	38%	54%	100%
		% WTP	2%	4%	2%	3%
Education	Education	Count	<b>3</b>	<b>4</b>	<b>12</b>	<b>19</b>
		% within occup.	16%	21%	63%	100%
		% WTP	5%	3%	4%	4%
Professional athlete	Professional athlete	Count	<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>
		% within occup.	25%	0%	75%	100%
		% WTP	2%	0%	1%	1%
Pensioner	Pensioner	Count	<b>3</b>	<b>3</b>	<b>5</b>	<b>11</b>
		% within occup.	27%	27%	45%	100%
		% WTP	5%	2%	2%	2%
Student	Student	Count	<b>2</b>	<b>11</b>	<b>23</b>	<b>36</b>
		% within occup.	6%	31%	64%	100%
		% WTP	4%	8%	7%	7%
Unemployed	Unemployed	Count	<b>3</b>	<b>4</b>	<b>6</b>	<b>13</b>
		% within occup.	23%	31%	46%	100%
		% WTP	5%	3%	2%	3%
Other	Other	Count	<b>1</b>	<b>9</b>	<b>15</b>	<b>25</b>
		% within occup.	4%	36%	60%	100%
		% WTP	2%	7%	5%	5%

The final cross-tabulation in Table 5 shows willingness to pay and the runners' province of residence. The province of residence is a proxy for the athletes' carbon footprint for the marathon. Those who live outside of Cape Town have to travel further and that increases their private and also social costs. Whether these participants take cognisance of their location and associated travel behaviour in their willingness to pay is not clear. It seems that those who travelled further may be more cost sensitive and less likely to make a contribution to mitigation of their emissions.

**TABLE 5: CROSS-TABULATION OF WTP AND PROVINCE OF RESIDENCE**

Variables			Willing to pay to mitigate climate change			Total
			Skipped	No	Yes	
Province of residence	Skipped	Count	<b>3</b>	<b>0</b>	<b>3</b>	<b>6</b>
		% within province	50%	0%	50%	100%
		% WTP	5%	0%	1%	1%
Western Cape		Count	<b>21</b>	<b>61</b>	<b>126</b>	<b>208</b>
		% within province	10%	29%	61%	100%
		% WTP	38%	45%	40%	41%
Gauteng		Count	<b>10</b>	<b>41</b>	<b>93</b>	<b>144</b>
		% within province	7%	28%	65%	100%
		% WTP	18%	30%	30%	29%
Eastern Cape		Count	<b>2</b>	<b>3</b>	<b>16</b>	<b>21</b>
		% within province	10%	14%	76%	100%
		% WTP	4%	2%	5%	4%
Free State		Count	<b>2</b>	<b>8</b>	<b>11</b>	<b>21</b>
		% within province	10%	38%	52%	100%
		% WTP	4%	6%	4%	4%
KwaZulu-Natal		Count	<b>4</b>	<b>6</b>	<b>22</b>	<b>32</b>
		% within province	13%	19%	69%	100%
		% WTP	7%	4%	7%	6%
Mpumalanga		Count	<b>5</b>	<b>1</b>	<b>6</b>	<b>12</b>
		% within province	42%	8%	50%	100%
		% WTP	9%	1%	2%	2%
Northern Cape		Count	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>
		% within province	0%	25%	75%	100%
		% WTP	0%	1%	1%	1%
North West		Count	<b>2</b>	<b>2</b>	<b>8</b>	<b>12</b>
		% within province	17%	17%	67%	100%
		% WTP	4%	1%	3%	2%
Limpopo		Count	<b>2</b>	<b>5</b>	<b>7</b>	<b>14</b>
		% within province	14%	36%	50%	100%
		% WTP	4%	4%	2%	3%
Outside SA		Count	<b>4</b>	<b>7</b>	<b>17</b>	<b>28</b>
		% within province	14%	25%	61%	100%
		% WTP	7%	5%	5%	6%

The provinces with the greatest proportions of runners who were willing to pay include the Eastern Cape (76%) and Northern Cape (75%). A middle group of provinces with participants who were willing to pay include Gauteng (65%), KwaZulu-Natal (69%) and the North West Province (67%). Of the participants from the Western Cape, who are closest to Cape Town, 61% were willing to pay for climate change mitigation. The provinces with the lower proportions of runners who were willing to pay were the Free State (52%), Mpumalanga (50%) and Limpopo (50%).

A cross-tabulation of province and total spending showed that total spending of athletes from the Free State and Mpumalanga, were less than that of the average participant, which may be linked to incomes. Those from Limpopo spent much more than average, which may be linked to distance and travel cost. Of the runners from outside South Africa, 61% were willing to pay.

The questionnaire also asked the participants who were willing to pay, why they would be willing to pay the additional fee. The reasons cited most were that they felt responsible for climate change and that they care about the environment in general. Protecting fauna and flora and giving money for good causes featured as secondary reasons. Similarly, the runners who were not willing to pay were asked why that was the case. The main reason given for not being willing to pay was that people believed that the mitigation programme will have no real impact. This was followed by reasons such as having too little income and not believing in climate change.

Finally, it is also possible to examine the runners' total spending during the Two Oceans Marathon per willingness to pay category and the differences were small. The average of total spending of those who are willing to pay was R4148, and for those who were not willing to pay, it was R4447. The spending of those who were not willing to pay also showed greater variation. Building on this description, the following section presents the empirical analysis of the predictors of which tourists are willing to pay more for a sustainable event.

## REGRESSION ANALYSIS

The empirical analysis involved the estimation of an ordered probit regressions model of the predictors of willingness to pay. Willingness to pay was modelled as a function of characteristics of Two Oceans Marathon participants. These explanatory variables include: gender (males=0), marital status (married=0), language (Afrikaans=0), education (no schooling=0), occupation (professionals=0), province that the runner is from (outside SA=0), number of nights spent in Cape Town, the type of accommodation used (local resident=0), age, total spending during the marathon weekend and a number of reasons why they were willing or not willing to pay.

Table 6 shows the results from the ordered probit regression. The willingness-to-pay dependent variable is seen as a rank of categories: those who are not willing to pay and those who are willing to pay R10, R30 and R50. Independent variables with positive coefficients are associated with increased willingness to pay. Table 6 also shows the results for the gender, marital status, home language, education and occupation variables. Standard errors are in brackets. Compared to males, females were willing to pay.

Compared to married respondents, those who are not married were willing to pay more and this effect was significant at the 5% level. None of the education groupings yielded significant coefficients, but it is interesting to note that, compared to those with no education, the other categories were not willing to pay. Compared to professionals, those who were self-employed (5% level of significance) and those in administrative positions (5% level of significance) and students (10% level of significance) were willing to pay.

**TABLE 6: REGRESSION RESULTS FOR DEMOGRAPHIC VARIABLES**

Variable	Ordered probit (SE)#	Variable	Ordered probit (SE)#
<i>Gender</i>		<i>Occupation:</i>	
Female	0.229 (-0.144)	Management	0.405 (0.204)**
<i>Marital status</i>		Self-employed	0.889 (0.232)**
Not married	0.387 (0.167)**	Technical	0.399 (-0.276)
Divorced	0.271 (-0.265)	Sales	0.610 (0.352)*
Widow/er	-1.343 (-1.108)	Administrative	0.612 (0.308)**
Living together	-0.147 (-0.390)	Civil service	0.507 (-0.440)
<i>Home language</i>		Educator	0.132 (-0.338)
English	-0.08 (-0.147)	Professional athlete	-0.591 (-0.659)
Foreign language	0.190 (-0.228)	Pensioner	-0.093 (-0.459)
<i>Education</i>		Student	0.348 (-0.290)*
Matric	-0.356 (-0.524)	Unemployed	-1.186 (0.614)
Diploma/degree	-0.078 (-0.519)		
Post-graduate	-0.082 (-0.529)		
Professional	-0.098 (-0.548)		

# SE = Standard Error

\*\* 5% level of significance

\* 10% level of significance

**TABLE 7: REGRESSION RESULTS FOR LOCATION, AGE, SPENDING AND ATTITUDE VARIABLES**

Variables	Ordered probit (SE)	Variables	Ordered probit (SE)
<i>Accommodation</i>		<i>Province</i>	
Family or friends	-0.221 (-0.229)	Western Cape	-0.313 (-0.360)
Guesthouse, B&B	-0.360 (-0.265)	Gauteng	0.079 (-0.307)
Hotel	-0.424 (-0.260)	Eastern Cape	0.171 (-0.418)
Camping	-0.560 (-0.667)	Free State	0.042 (-0.450)
Rent house	-0.439 (-0.375)	KwaZulu-Natal	-0.184 (-0.366)
Other	0.162 (-0.446)	Mpumalanga	-0.111 (-0.505)
<i>Age</i>	0.027 (0.008)**	Northern Cape	1.017 (-0.696)
<i>Total spending</i>	-0.006 (0.000)	North West	1.516 (0.588)**
<i>Will pay</i>		Limpopo	-0.742 (-0.515)
Responsible	0.852 (0.142)**	<i>Will not pay</i>	
Protect	0.245 (-0.224)	No impact	-1.768 (0.272)**
Good cause	0.265 (-0.227)	Little income	-1.193 (0.282)**
		Do not believe	-0.905 (0.264)**
N = 423		Pseudo R <sup>2</sup> = 0.22	

# SE = Standard Error      \*\* 5% level of significance

Table 7 shows the results for the rest of the independent variables, including age, province, total spending and attitudes. The results showed negative (but insignificant) relationships between willingness to pay and respondents from the Western Cape, KwaZulu-Natal, Mpumalanga and Limpopo. Those from the North-West Province were willing to pay and the coefficient was significant at the 5% level.

The measure of the type of accommodation did not yield any significant coefficients. Age was positively and significantly associated with willingness to pay. Total spending was positive, but not significant and the coefficient was very small. Finally, there were clear

positive relationships between the main reasons people indicated they were willing to pay or not willing to pay and their WTP choices.

As an alternative to the ordered probit model, a multinomial logistic regression was also estimated. These results are not reported in detail since not all the payment groups contain observations for each of the predictor variables and when there are few observations, the standard errors of the estimated coefficients become extremely large. The method does, however, allow one to say slightly more about the predictors of willingness to pay R10, R30 and R50 compared to the base category of those who were not willing to pay to mitigate their footprint. Among those who were willing to pay R10, there were a number of significant predictors. Being married, from the Eastern Cape Province and feeling responsible for climate change were positively and significantly associated with willingness to pay. Compared to those with no schooling, all the other categories showed a negative relationship with willingness to pay and significantly so. In the case of the runners who were willing to pay R30, very few of the determinants were found to be significant. Here, all the education coefficients were positive, but insignificant.

The results for the runners who were willing to pay R50 showed that gender, marital status, home language and education coefficients were all insignificant. Compared to the professionals, the self-employed, administrative staff and civil servants were willing to pay more and the effect was significant. Age was also found to be a significant determinant of willingness to pay for climate change mitigation.

## CONCLUSIONS AND RECOMMENDATIONS

This paper made a number of important findings within the South African context.

- Firstly, there were some people who were willing to pay for a “greener” marathon. Seen within the context of the growing number of sport events in South Africa, this is a positive result. This may also have implications for other more environmentally sustainable events and tourism experiences.
- Secondly, the analysis did not find that income was an important correlate of willingness to pay, but discretionary income may be the willingness to pay of non-married people and self-employed people were significant.
- Thirdly, different sectors of the tourism and leisure industry may behave differently concerning “green issues”. The international literature emphasises demographic variables, like age and education, as predictors of willingness to pay, but this was not borne out by this research amongst athletes. In related work at the Spier Wine Estate, Fourie (2011) also shows that simple socio-demographic variables do not explain willingness to pay for green initiatives.

The conclusion is that this research presents an opportunity. If people are willing to pay for “greener” and more environmentally sustainable events, the organisers of major sport events should provide it. It may make a substantial contribution to meeting corporate social responsibilities. This also presents a challenge regarding further research on segmenting the market and profiling “green” participants or attendees.

Two recommendations for future research are proposed. Surveys need to go beyond simple demographics and ask questions about people's knowledge of and concern about the environment, climate change and mitigation. People may be "green", independent of their age, education or income. Beliefs and attitudes as predictors of willingness to pay should be explored further in greater detail. Surveys may also combine methods to shed light on willingness to pay. At tourist destinations where specific elements of the environment need protection, the contingent valuation question can be combined with travel cost analysis. There is an interesting research agenda opening in this field.

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