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Happiness as a Reward for Torture: Is Participation in a Long-Distance Triathlon a Rational Choice?

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Abstract

This study applies prospect theory to an assessment of actual behavior. Loss aversion, reference dependence, and diminishing sensitivity are conceptualized through survey respondents' perceptions of physical and mental torture during training for and competition in long-distance triathlons. Regression results show that frequent thoughts of giving up during the race negatively affect happiness after the race, while mental torture during training and race is negatively associated with happiness in the weeks after the race. Satisfaction with race outcome positively affects happiness, suggesting that achieving individual goals is more important than absolute performance in terms of finishing times and ranks.

Keywords

behavioral economics, extreme sports, Ironman, prospect theory

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Introduction

Long-distance triathlon competitions are grueling athletic competitions comprised of three segments, a long-distance swim (3.8 km), followed by bicycle ride (180 km), and completed with marathon length foot race (42.195 km). McCarville (2007) notes that every triathlon is intentionally difficult, particularly the long-distance race, where each component of the race, derived from a stand-alone event itself, is designed to test the limits of human endurance. The predominant objective of participants is to finish the race within an accepted standard time—for long-distance triathlons that time is 17 hr. A logical goal of the triathlete is to prepare for and engage in a meaningful challenge and reap the psychic reward for meeting that challenge. McCarville (2007) focuses on the importance of finishing the event as necessary for achievement of the goal (McCarville, 2007). He describes the common occurrence where the day after an Ironman event *finisher* gear and clothing are placed on sale. These materials are very much in demand and people must have finished the event to be allowed to purchase them. Wearing this gear signals that one has faced and passed the test that the long-distance triathlon offers.

Athletes can have different goals for participating in long-distance triathlon events. Croft, Gray, and Duncan (1999) indicate that personal goal achievement and competition are the two highest motivations for triathletes. While personal goal achievement could be just to finish, for a subset of athletes the competition with other racers is important, and thus their place of finish reveals a more prominent goal (Stoeber, Uphill, & Hotham, 2009). There is of course an overall winner, usually a professional triathlete; and also winners for a myriad of age-group categories for men and women. Additionally, qualification for the Ironman Hawaii can be a goal of similar importance to *Boston Marathon* qualification for marathon runners. However, the qualification for Hawaii is based on the rank in one's age-group and the number of available slots for each age-group (Britt, 2014a), not specific finish times, as is the case for the Boston Marathon (Allen, Dechow, Pope, & Wu, 2016).

Those who choose long-distance triathlon as a leisure activity, do so at considerable cost. In addition to the extreme physical and mental demands of the race itself, costs include out of pocket expenses for equipment and travel (Wicker, Prinz, & Weimar, 2013), the opportunity cost of countless hours of preparation time (Kennelly, Moyle, & Lamont, 2013), and the possibility of incurring debilitating injuries and health problems (Burnes, Keenan, & Redmond, 2003). Nevertheless, the number of triathlon events and participants has grown exponentially since the sport's beginnings in the 1980s (USA Triathlon, 2011). Far more people desire to compete than are slots available at major long-distance and Ironman[1] events (Britt, 2014b). Therefore, considerable rewards must exist which encourage the choice to prepare for and compete in a long-distance triathlon. The question becomes how the benefits are reckoned against the tortuous costs to reflect an economically rational choice.

Participation in a long-distance triathlon race is not associated with financial rewards for the amateur triathletes who are the focus of this research. The rewards for torture for these athletes thus must be evaluated on a psychological level in terms of intrinsic gains and losses (Allen et al., 2016), like those described by Loewenstein's (1999) conception of the utility from climbing mountains. Previous research has confirmed that most triathlon competitors instead seek the satisfaction of more intrinsic or internal goals (Tribe Group, 2009). Thus, happiness derived from participating in and finishing a long-distance triathlon is assumed to be an important reward for torture. While existing research has already examined the effect of participation in sport and physical activity in general on happiness (e.g., Lee & Park, 2010; Wicker & Frick, 2015), studies considering the effect of particularly tortuous activities like long-distance triathlons on the perception of happiness have not yet been conducted. Hence, we advance the following main research question: What factors—specifically torture—contribute to the happiness of triathletes when finishing the race and then continue in the weeks afterward?

This study considers a behavioral economics application to the choices made regarding long-distance triathlon participation. To evaluate the benefits and costs trade-off, we employ the value function of prospect theory (Kahneman & Tversky, 1979). We also consider the integration of the goal concept from psychology with prospect theory, as the setting of goals is of particular relevance in the training-to-competition paradigm of the triathlon. As Kahneman (2011, p. 303) summarizes

> . . . not achieving a goal is a loss, exceeding the goal is a gain . . . the two motives are not equally powerful. The aversion to the failure of not reaching the goal is much stronger than the desire to exceed it.

Prospect theory has been most often applied to observed incongruities with rational choice theory regarding observed financial choices (Prelec & Loewenstein, 1998; Thaler, 1985; for an overview, see Barberis, 2013). Empirical verification of prospect theory is largely supported by contained experiments where control groups or survey respondents are asked how they would choose among alternatives rather than through observations of actual behavior—with a few exceptions (Allen et al., 2016; Barberis, 2013). Thus, questions remain about the real-world relevance of prospect theory. A long-distance triathlon provides a useful real-world setting rather than contrived choices and behavior.

Theoretical Framework and Literature Review

Prospect Theory

Prospect theory (Kahneman & Tversky, 1979) developed as an explanation for individual behavior that violates the assumptions of the traditional expected utility model. In the standard utility model, the choice of an unpleasant activity is bargained

for something offering a positive benefit; say labor is traded for income. The choice of arduous activities as leisure with no corresponding income or other tangible return is evidently irrational and poses some peculiar challenges to the concept of utility. Loewenstein (1999) offers mountaineering as an example for a sport where an unpleasant, or tortuous, leisure choice is rational based on a broader interpretation of utility. However, that choice is fundamentally rooted in utility theory's original conception. He contemplates four derivatives of utility: self-signaling/esteem, goal completion, mastery, and meaning, all in the context of an extreme sport. He argues that climbing a high peak is a painful experience, and one that does not provide consumptive pleasure. Therefore, the expected utility resultant, and the motivation to undertake and complete such a task as a leisure activity, must be derived from nonconsumptive sources. His analysis sheds light on the utilitarian benefits that may/must be expected from the consumption of unpleasant leisure.[2]

Three tenets of prospect theory are particularly relevant to endurance sports competitions: *reference dependence*, *loss aversion*, and *diminishing sensitivity*. Reference dependence refers to derivation of utility measured relative to a reference point rather than utility as an absolute value. The theory predicts that rather than maximizing over final consumption levels, individuals make decisions based on whether an undertaking will result in an expected gain or loss that is measured against a predetermined value decided as a benchmark (Kahneman & Tversky, 1979). For example, suppose an income of €100,000 serves as the reference point, perhaps because the €100,000 benchmark moves the person to become a *six figure* earner and meeting that reference point provides additional value. The person, thus, may make greater effort to gain €5,000 in additional income to move from €95,000 to in annual earnings than from other €5,000 increments on either side of the benchmark (€90,000 to €95,000 and €100,000 to €105,000).

Heath, Larrick, and Wu (1999) extend this theory with their consideration of goals as defining the reference points, and Allen, Dechow, Pope, and Wu (2016) apply this conception of goals as reference points. They assume that the utility amateur marathon road racers derive from completing the race must satisfy intangible goals because they receive no explicit prize or financial payoff for finishing the race. Their method does not attempt to ascertain the actual goals of individual runners but instead presumes that round number times and Boston Marathon qualifying times are indicative of a competitor's personal marathon goals. The empirical results show significant bunching of finish times at half an hour and hour times and around Boston Marathon qualifying times, providing strong evidence that runners do use reference point goals to evaluate their performance, as consistent with prospect theory. Moreover, runners were found to quicken their pace near the end of races when they are close to achieving a reference point time. Specifically, male runners were more likely to be motivated by reference points and exhibit this behavior. Their study provides valuable insights into the behavior of endurance athletes but is based solely on secondary data and does not specifically measure intrinsic rewards.

Loss aversion describes situations where individuals are observed to place higher values on losses relative to gains of the same magnitude. They will therefore exert more effort to avoid a loss than to receive a gain of a similar magnitude. For example, Thaler (1985) has described the particular case of the *endowment effect* where people assign a higher value to an item they own than they would be willing to pay to acquire that exact same item. In other words, people must be compensated more to part with their item than they would pay to obtain that item from someone else. Thus, the cost of parting with the item through its sale exceeds the benefit of obtaining it by purchase, based on different values placed thereon according to which side of the transaction the individual is faced. Likewise loss aversion, according to Heath et al. (1999), implies that when a set goal defines the reference point, if a person falls short of her goal, she feels more pain than the pleasure experienced if she had surpassed the goal by a parallel amount. Allen et al. (2016) formulate the *loss*, which under prospect theory is more heavily valued than a gain, as the failure to attain a personal goal.

Diminishing sensitivity implies that the marginal effects on satisfaction decrease for outcomes farther from the reference point. This is true for both gains and losses. From the example above, using €100,000 in annual income as the reference, the implication is the gain in satisfaction from an increase from €100,000 to €105,000 exceeds that of an equivalent €5,000 increases from €150,000 to €155,000. Likewise, falling short of €100,000 by €5,000 and reaching €95,000 are more painful than a loss of €5,000 from €50,000 to €45,000.

The Triathlon Value Function

Generally speaking, a *value function* frames one's perceived gains and losses to a reference point (reference dependent choices; Kahneman & Tversky, 1979). This section formulates assumptions regarding the value function for participation in a long-distance triathlon and potential gains from torturous experiences. The Oxford Dictionary (2014, n.p.) defines torture as "great physical or mental suffering." This definition recognizes that torture does not only relate to physical aspects of training and racing, which are obvious for long-distance triathlons, but also to mental suffering. Loewenstein (1999) describes in detail, based on participants' accounts, similar levels of suffering for mountaineers. However, here we link the idea of torture to the tenets of prospect theory and the value function that are particularly relevant to endurance sport competitions, that is, reference dependence, loss aversion, and diminishing sensitivity (Heath, Larrick, & Wu, 1999; Kahneman & Tversky, 1979; Thaler, 1985). Like Loewenstein (1999), we recognize the importance of set goals in tortuous participation choices.

The value function is illustrated in Figure 1. The slope of our value function replicates similarly that of Kahneman and Tversky (1979) and Heath et al. (1999). Value, the intangible benefit (measuring happiness) obtained by the athlete from participation, is increasing up the vertical axis. The derived actual finish outcomes are reflected left to right on the horizontal axis as losses to gains. The goal as

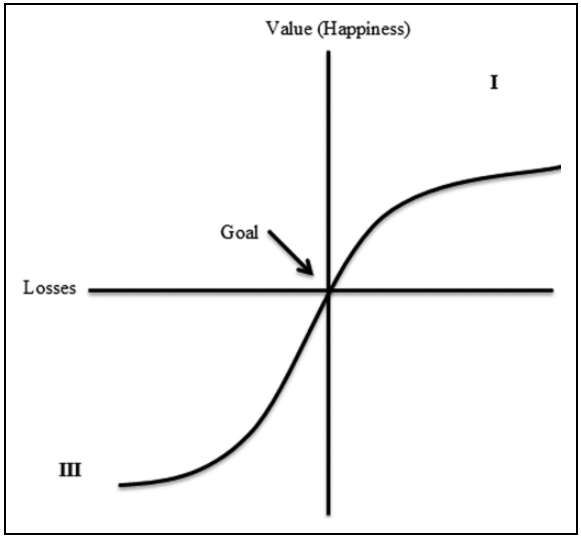

Figure 1. Value function shows the reference point at the intersection of *x* and *y*. Loss aversion is indicated by the steeper slope in Quadrant III in comparison to Quadrant I. The decreasing slope moving in either direction from the reference point indicates diminishing sensitivity.

represented in Figure 1 is at the intersection point of the axes and defines the reference point in line with prospect theory (Heath et al., 1999). Goals vary across athletes, ranging from simply finishing (within the customary time) to individual performance goals in terms of finishing times or ranks. While the functional form is constant for all participants, the intersection point may reflect quite different race outcomes.

The slope of the curve in Quadrant III representing a loss (lower left) is steeper than in Quadrant I (upper right) which shows gains. The curves in each quadrant are similarly S-shaped as the slope decreases moving in either direction from the origin (the goal point). The steeper slope in Quadrant III relative to Quadrant I represents loss aversion. This implies as was the case with the income example above that if a fifth place is the racer's goal, improving from sixth place to fifth returns more value than moving up from fifth to fourth.

The decreasing slopes of the value function in both directions characterize the diminishing sensitivity. The fluctuating slope shows that outcomes have a smaller marginal impact as they move the farther from the goal or reference point. The racer with the fifth place goal is happier to finish in second place than in third place, but the value gained from going from third to second is less than the gain of fifth to fourth which is closer to the reference point. Likewise, finishing eighth when seventh was in reach is painful, yet marginal change in pain is not nearly as much

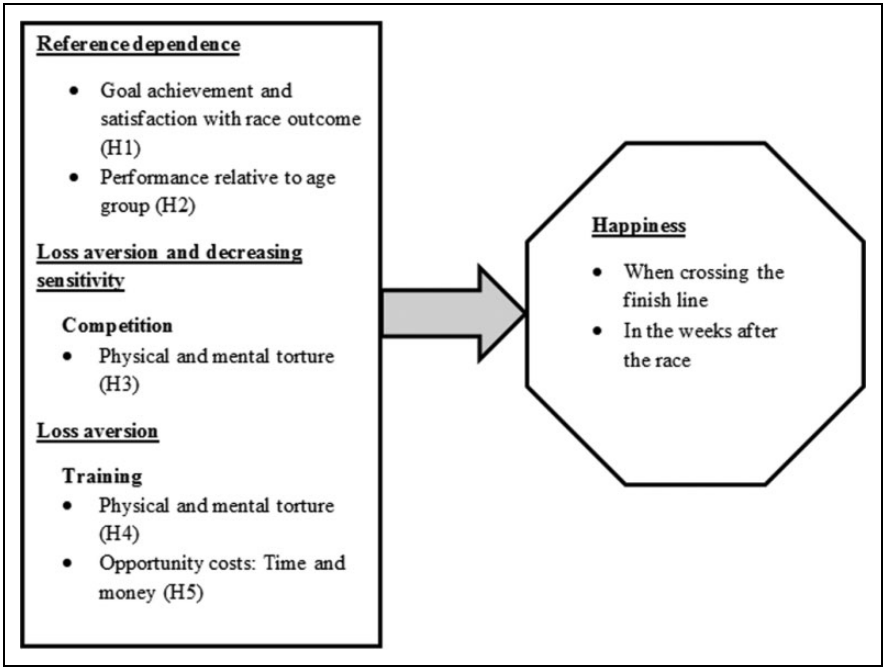

Figure 2. Theoretical model explaining the effects of reference dependence, loss aversion, and decreasing sensitivity on happiness in long-distance triathlon.

as from a sixth place finish instead of fifth, when the racer was very close to reaching his goal, but failed. We proceed with an understanding that the value function is sufficient to explain how these goals affect the triathlete's motivation both in the race and in the preparation.

Development of Race Outcome Hypotheses

Figure 2 gives an overview of the hypotheses. The setting of a goal is critical to the choice of triathlon competition and determines the reference point, which defines the boundary between success and failure. Given the long time frame of a long-distance triathlon—most amateur athletes need at least nine (males) or 10 hr (females) to finish a race—racing is typically an intermittent experience associated with both physical and mental *ups and downs* during the race. Athletes invest energy and go through torture to avoid a loss in terms of not finishing the race, or not reaching a personal time or finish place goal. The goal itself is of great importance to outcome-based satisfaction. Garland (1984) found that high goal subjects were less satisfied with high performance. For example, a triathlete whose goal is to win her age-group may be disappointed with a strong, but nonwinning outcome, while a less

competitive athlete with a goal to simply finish may reveal high satisfaction with a similar outcome. The first hypothesis captures the role of goal achievement and satisfaction with race outcome:

Hypothesis 1: The higher the triathlete's level of goal achievement and satisfaction with the race outcome, the greater the reported level of happiness.

The idea of reference dependence can be applied to long-distance triathlons where the absolute finishing times are less important to triathletes because they are highly course and race specific. In other words, it is difficult to compare times across different races even though the total distance and length of each segment is the same. Races are also affected by the weather and the topography of the race course, which cannot be influenced by athletes. For example, a hot weather and hill-laden running segment makes a race much more difficult and yields slower finish times than a cool weather race day and relatively flat course topography. Consequently, individuals' goals tend to be set as a comparison of their own performance to other competitors in the race rather than the absolute finishing time.

Amateur triathletes are ranked in their gender-specific age groups. Each age-group consists of athletes who were born within 5 consecutive years. For example, the age-group M25–29 (W25–29) is comprised of males (females) who are between 25 and 29 years of age in the year of the race (criterion: year of birth). There are two exceptions: The youngest age groups encompass 7 years (M18–24, W18–24) and the oldest have no upper bound, including all racers aged 80 years and older (M80 and W80). The age-group ranking system allows athletes to compare their performance with athletes of the same age and gender. Consequently, it can be assumed that the competitors in the same age-group represent the reference point more so than the overall winner of the race (who is typically a professional ranked within the group of professionals). This aspect is mirrored in the following hypothesis:

Hypothesis 2: The better the performance of the triathlete relative to the other competitors in the age-group, the higher the reported level of happiness.

Considering loss aversion, remember that benefits are measured in Quadrant I of the function graph. Reaching any point in that quadrant implies the goal has been met. In regard to satisfaction, if a racer misses her goal, she should feel more pain than the pleasure if she exceeded her goal by the same amount. The degree that performance exceeds the goal is higher and to the right on the function. Thus, while achieving a goal is on net beneficial, if the athlete struggles and just accomplishes the goal there is less expected happiness than if the goal is easily met.[3] Moreover, diminishing sensitivity implies that there are significant returns to happiness for achieving even a slightly better finish than that targeted outcome. During such a long race, athletes suffer through periods where they do not feel well and think about giving up (McCarville, 2007). The degree of torture may also be mirrored in the frequency these thoughts about quitting occur. Frequent thoughts about giving up

imply that the race is not going well, which may negatively affect happiness. Thus, when athletes have finished the race nevertheless, they are likely relieved, not happy.

Hypothesis 3: The more physically and mentally challenging the race, the lower the reported level of happiness.

Development of Hypotheses on Choices in Race Preparation

The second, and at least equally important, dimension of triathlon participation is that each race requires several months of preparation and training. The training and preparation period is likewise both physically and mentally challenging, and over a much longer time frame than the 1 day race. There may be days when athletes are not motivated to train because of bad weather, exhaustion, or minor pain. In an effort to avoid a loss at the race, athletes may also decide to exercise on days when they are not motivated and thus they torture themselves. It is thus assumed that such difficulties faced during the training period do not contribute to their happiness. Hence, the goal, which ultimately serves as the reference point, is determined with the decision to commence training for a race. Heath et al. (1999) consider the link between motivation from the psychology literature on goal setting and the decision analysis of the value function. They surmise that the setting of a goal becomes a reference point that systematically alters the value of outcomes. When setting a goal, people become more motivated to exert effort and to persist and as a result they perform better. High goal setters were found to exert more effort and are more persistent or, in other words, less likely to quit when encountering difficulties (Heath et al., 1999). Effort and persistence are critical to motivation in the training period for triathlons and race preparation likely affects happiness:

Hypothesis 4: The more physically and mentally challenging the training and preparation for the race, the lower the reported level of happiness.

Opportunity costs of time and money must be taken into account as well. Preparing for a long-distance triathlon requires some weeks or months with disproportionately high training loads compared to the training regime for shorter distance events. The heavy training period directly before a race is referred to as the *load weeks*. Heath et al. (1999) point out the conundrum of setting high goals: Those with higher goals face more difficulty and lower probability of achievement (higher probability of a loss). Thus, they are more likely to receive less value than participants with modest goals. The conundrum is partially explained by considering the effect of the goal on the racer's motivation. Those who set higher goals will be motivated to incur greater costs of all types during the training period in order to achieve a more difficult race goal. When triathletes decide to spend more time on training, the opportunity costs of time increase since this time cannot be spent with partner, colleagues at work/school, family, and friends. Lamont, Kennelly, and Wilson (2012) confirmed that nonelite triathletes are faced with competing priorities including familial relationships, domestic responsibilities, sociability, leisure, and work/education that may constrain

their participation. When more time is spent on training due to the preparation for a long-distance triathlon race while neglecting other areas of social life, then the opportunity costs of training are higher. Should triathletes choose the high opportunity costs of training so as to avoid a loss at the race, then it can be expected that these costs are positively associated with happiness after the race.

In addition to the time costs, monetary costs are relevant. Lamont et al. (2012) noted that finances represent another competing priority for triathletes. Research showed that participation in triathlons in general, and specifically in a long-distance event, is associated with significant financial outlays (Wicker et al., 2013). Competing alternatives, such as a new car, a family holiday, or household goods, are foregone. Again, if the individual feels it is worth spending the money on triathlon in an effort to avoid a loss at the race, then a positive effect of the financial investments on happiness can be assumed.

Hypothesis 5: The higher the opportunity costs of time and money, the higher the reported level of happiness.

Method

Sampling Procedure

Primary data were collected using an online survey since triathletes have been found to extensively use various types of media including the Internet (Tribe Group, 2009). The questionnaire was provided in two languages, German and English, in order to facilitate participation in several countries. The link to the survey was posted in triathlon fora (e.g., www.slowtwitch.com; www.tri-news.co.uk),on the official Facebook page of the Ironman European Championship, on the websites of major triathlon clubs in Germany, and on private Facebook sites. The survey targeted triathletes who participated in a long-distance race in 2012 or 2013 (first wave) and in 2014 or 2015 (second wave). This target ensured that respondents still had relatively sound memories of their training and race experiences. Respondents were instructed to consider only their most recent long-distance triathlon since some triathletes participate in more than one long-distance race per year. Nevertheless, the target group is only a small subgroup of all triathletes (Wicker et al., 2013), which makes it challenging to find a sufficient number of survey respondents.

The survey was available during two periods: (1) from December 22, 2013, to January 29, 2014, and (2) from December 2, 2015, to March 31, 2016. In the first wave, 305 people started the survey and 239 finished it. In the second wave, 176 people started the survey and 124 completed it, leading to an initial sample of $n = 363$. Several cases had to be removed during the data cleaning process because of incomplete responses (i.e., some respondents did not answer core questions such as triathlon-related expenses and income), implausible answers, and indications of clicking through the survey without reading the questions. Altogether, the final sample size consisted of $n = 241$ complete observations that were suitable for the empirical analysis.

Questionnaire and Variables

The questionnaire was designed to examine the costs and benefits of participation in a long-distance triathlon. It comprised three main sections: experiences at the race, training for the race, and other personal information. The resulting variables are summarized in Table 1.

In the first section of questions, respondents were asked for the year and name of their most recent long-distance race. The variable PERF_WINNER was created based on this information. It controls for differences in race topography, weather conditions, and other beneficial or adverse circumstances on the race day which may affect reported happiness levels. Respondents were also asked to report whether they finished and if so, their finishing time (PERF_ABS). This variable controls for the heterogeneity of performance levels within this sample of amateur triathletes. Then, respondents should state their rank in the age-group (RANK); the frequency of thoughts about giving up during the race (GIVEUP), how physically (RACE_PHYS) and how mentally challenging (RACE_MENT) they found the race, how happy they were when crossing the finish line (HAPPY_FINISH) and in the weeks after the race (up to 4 weeks; HAPPY_AFTER), whether they posted their race result on social networks like Facebook or Twitter (POST), and their satisfaction with race outcome (SAT_RACE). Triathletes can have various goals, such as achieving a specific time or rank or just finishing the race (Stoeber et al., 2009), and satisfaction with race outcome also reflects the extent to which they have achieved these individual goals (Garland, 1984).

The second block of questions assessed training and preparation for the race. Respondents were asked to report the number of months they prepared for their last long-distance race (TRAIN_MONTHS), the number of hours they trained on average in load weeks (TRAIN_HOURS), and to what extent they encountered problems with their partners, colleagues at work or school, family, and friends as a result of spending more time on training (on a 5-point scale). The variable TRAIN_PROB captured the average problem resulting from the previous four aspects.

Respondents were then asked to estimate their triathlon-related expenditure during the year of their most recent long-distance race. They were provided with several expenditure categories (e.g., clothing/shoes, equipment, training, training camps, races, entry fees, membership fees, and start license) to ensure that they did not forget any expenses (Wicker et al., 2013). Survey takers were also asked if they were compensated in any manner for participation in the triathlon (e.g., prize money, travel expenses, and sponsorship income). Amateur triathletes do not generate large incomes from their sport; however, it is possible that some earn modest prize money at local races. The total net expenditure on triathlon (EXP) was computed by adding up the expenditure categories and subtracting any earnings generated from the sport.

The level of torture during the training was assessed with a set of questions, where individuals were asked to state their level agreement on a 5-point Likert-type scale (1 = *strongly disagree*; 5 = *strongly agree*). Since by definition torture comprises both physical and mental suffering, items were created to gauge both facets of torture.

Table 1. Overview of Variables and Summary Statistics.

Variable	Description	Hypothesis	Mean	*SD*
HAPPY_FINISH	Happiness when crossing the finish line (0 = *totally unhappy*; 10 = *totally happy*)		8.22	2.34
HAPPY_AFTER	Happiness up to 4 weeks after the race (0 = *totally unhappy*; 10 = *totally happy*)		7.28	2.30
SAT_RACE	Satisfaction with race outcome (0 = *totally dissatisfied*; 10 = *totally satisfied*)	Hypothesis 1	6.68	2.72
RANK	Rank in age-group at the race	Hypothesis 2	134.59	250.31
GIVEUP	Frequency of thoughts about giving up during the race (0 = *never*; 1 = *once*; 2 = *several times*; 3 = *all the time*)	Hypothesis 3	0.55	0.85
RACE_PHYS	Race was physically challenging (0 = *not at all*; 10 = *totally challenging*)	Hypothesis 3	7.28	2.15
RACE_MENT	Race was mentally challenging (0 = *not at all*; 10 = *totally challenging*)	Hypothesis 3	7.11	2.35
TRAIN_PHYS	Physical torture during training (Table 2; 1 = *no torture*; 5 = *high level of torture*)	Hypothesis 4	2.74	0.49
TRAIN_MENT	Mental torture during training (Table 2; 1 = *no torture*; 5 = *high level of torture*)	Hypothesis 4	2.51	0.55
TRAIN_MONTHS	How many months did you prepare for your long-distance race?	Hypothesis 5	8.63	6.81
TRAIN_HOURS	How many hours did you train on average in load weeks?	Hypothesis 5	14.61	4.24
TRAIN_PROB	Did you encounter any problems in the following areas as a result of you spending more time on training? My partner, people at work/studies, my family, my friends (1 = *strongly disagree*; 5 = *strongly agree*), mean variable calculated	Hypothesis 5	2.09	0.79
EXP	Total expenditure on triathlon in the year of the long-distance race (in €)	Hypothesis 5	4,141.72	3,243.90
PERF_WINNER	Finishing time of race winner (in minutes)		501.23	30.90
PERF_ABS	Absolute performance: athlete's finishing time in the race (in minutes)		698.89	95.69

(continued)

Table 1. (continued)

Variable	Description	Hypothesis	Mean	*SD*
POST	Race result posted on social networks like Facebook or Twitter (1 = *yes*)		0.46	0.50
FEMALE	Gender (1 = *female*)		0.15	0.35
AGE	Age		39.13	8.71
AGESQ	Age squared		1,607.23	713.66
EDU	Highest educational level attained (1 = *not a graduate*; 7 = *university graduate*)		5.71	1.57
INC	Personal monthly net income (in €)		2,984.59	1,142.16

Note. $n = 241$.

Table 2. Overview of Items Measuring Physical and Mental Suffering During Training.

Construct	Item (1 = *Strongly Disagree*; 5 = *Strongly Agree*)	Mean Item (After Recoding)	Mean Construct
TRAIN_PHYS	At times, I was so exhausted that I thought I could not do the next training session	2.75	2.74
	At times, I felt my training was below standards needed for a good finish time	3.69	
	I often trained even more than I had planned[a]	3.65	
	I was constantly physically tired in the load weeks	2.79	
	I was feeling physically strong during training[a]	2.19	
	Training alone was particularly hard	2.21	
	I was more susceptible to infections in the load weeks	2.22	
	I was training although I had a few injuries	2.27	
TRAIN_MENT	I enjoyed training for the long-distance race[a]	1.74	2.51
	I was always motivated to train[a]	2.74	
	I did not have the motivation to do many other things in the load weeks (e.g., social contacts)	2.86	
	I was feeling happy during training[a]	2.07	
	When the weather was bad, it was really hard to motivate myself to train	2.62	
	The long runs and bike rides were mentally challenging	2.92	
	At times, I was asking myself "why am I doing all this?"	2.48	
	At times, I felt sorry telling other people that I cannot meet them because I have to train	2.68	

[a]Items were reverse coded but are now recoded.

Sixteen items (Table 2) were developed based on the previous research on motives and feelings in extreme sports (Allmer, 1998; Gabler, 2002; Wilhelm, 1995). Five items were reverse ordered, so that respondents would not just click through the survey and give the same response for every item. The variables TRAIN_PHYS and TRAIN_-MENT were computed by adding up the 8 items each and dividing the sum by eight. The questionnaire concluded with a set of personal and demographic indicator questions to determine each participant's gender (GENDER), age (AGE), home country, highest level of education (EDU), and personal monthly net income (INC).

The present survey, like many other surveys, relies on respondents' ability to adequately recall information (Bradburn, Rips, & Shevell, 1987). For example, answering the happiness questions requires recalling feelings. In this regard, *focusing effects* may be an issue, that is, respondents may overstate the importance of an event while they are thinking about it (Kahneman, 2011). Importantly, the questions assessing happiness are similar to the ones asked in the German Socio-Economic Panel (GSOEP)—a nationwide household panel survey. Since average happiness levels in the weeks after the race ($M = 7.28$) are similar to average life satisfaction levels for the German population between 2012 and 2015 (mean values are between 7.19 and 7.38 on the same 11-point scale), focusing effects may be less of an issue.

Another concern may be that some respondents have poor recall memory and may only remember the peak and end of an event (Kahneman, 2011). Existing research has shown that respondents achieve better recall levels when they are asked for the most recent item within a series of events (Bradburn et al., 1987). The present study addresses this aspect by asking for the most recent long-distance race. Moreover, long-distance triathlons can be considered prominent life events as participants tend to organize their life around training and preparation and negotiate cognitive and behavioral constraints (Kennelly et al., 2013; Lamont, Kennelly, & Wilson, 2012). Hence, issues resulting from recall bias cannot be ruled out but may be mitigated by the above aspects.

Empirical Analysis

A set of regression models was estimated to analyze the factors affecting happiness when crossing the finish line and in the weeks after the race. The first group of models is ordered probit (OP) models, which take into account the ordinal scale of the dependent variables. The second group employs ordinary least squares (OLS) regressions that allow reporting standardized coefficients and effect sizes, respectively. All variables from Table 1 are included as independent variables in both sets of models except POST, which is only entered in the models for HAPPY_AFTER because at the time of crossing the finish line the respondents could not have posted the race result on social media yet. All independent variables were checked for multicollinearity using correlation analyses. Since all correlation coefficients were well below .9 (Tabachnick & Fidell, 2007), there should be no multicollinearity issues in the models.

Results and Discussion

The summary statistics (Table 2) show that 85% of respondents are male. On average, respondents are 39 years old, have some form of university degree, and earn €2,984 net per month. This study confirms previous research indicating that most triathlon participants are well-educated, affluent, and middle-aged males (Mutter & Pawlowski, 2014; Wicker et al., 2013). Respondents prepared on average 8.6 months for the race and trained 14.6 hr per week in their load weeks. This weekly training load is higher than those of triathletes who only compete in shorter distances (Mutter & Pawlowski, 2014; Wicker et al., 2013). The training was perceived as slightly more physically as mentally challenging (2.74 vs. 2.51). Respondents encountered relatively few problems with partners, colleagues at work/studies, family, and friends resulting from the increase in training during load weeks ($M = 2.09$). They reported triathlon-related spending of €4,142 in the year of the race—more than the average yearly expenditure (€2,745) of all triathletes (Wicker et al., 2013).

Respondents found the race to be both physically ($M = 7.28$) and mentally ($M = 7.11$) challenging but reported thoughts about giving up during their race only rather unfrequently ($M = 0.55$). Similarly, physical torture during the race was perceived as only slightly higher than mental torture, supporting the importance of mental strength for finishing such a race. Average satisfaction with race outcome was 6.68, suggesting that respondents have largely achieved their individual goals and have been satisfied with their performance. Participants achieved an average rank of 134th place in their age-group and needed more than 3 hr longer to finish than the overall winner of the race. Thus, they were neither close to winning their age-group nor qualifying for *Kona* (if they participated in an Ironman). Finishing a long-distance race might have been in itself an achievement for most respondents. Almost half of participants (46%) posted their race result in social networks, indicating they were proud of what they achieved. Accordingly, respondents revealed that they were very happy when crossing the finish line ($M = 8.22$). The level of happiness in the 4 weeks after the race dissipated only slightly ($M = 7.28$), indicating that the positive feelings were retained for some time.

The results of the regression models are summarized in Table 3. Overall, the models are relatively robust, with no material differences between the OLS and OP estimates in terms of significance of the coefficients. However, the statistical significance of coefficients differs between the models examining happiness levels when crossing the finish line and happiness in the weeks after the race. Thus, respondents were able to distinguish between their feelings, allowing a nuanced analysis of factors.

Satisfaction with race outcome is significantly and positively associated with happiness when crossing the finish line and in the weeks after the race. Hence, Hypothesis 1 can be confirmed. In combination with the insignificance of respondents' absolute performance, this finding suggests that achieving individual goals is

Table 3. Summary of Regression Models.

	Model 1 (OP): HAPPY_FINISH		Model 2 (OLS): HAPPY_FINISH		Model 3 (OP): HAPPY_AFTER		Model 4 (OLS): HAPPY_AFTER	
Variable	Coefficient	*z* Value	Coefficient	*t* Value	Coefficient	*z* Value	Coefficient	*t* Value
SAT_RACE	0.187	5.35***	0.412	6.49***	0.237	6.84***	0.479	8.44***
RANK	0.000	0.42	0.034	0.53	0.007	2.76**	0.140	2.41**
GIVEUP	−0.166	−1.63*	−0.153	−2.41**	−0.021	−0.22	−0.047	−0.84
RACE_PHYS	0.027	0.57	0.041	0.54	0.008	0.22	0.064	0.96
RACE_MENT	0.013	0.32	0.051	0.68	−0.076	−2.00**	−0.127	−1.89*
TRAIN_PHYS	0.209	1.01	0.086	1.13	−0.053	−0.28	−0.022	−0.33
TRAIN_MENT	−0.162	−0.84	−0.096	−1.21	−0.472	−2.55**	−0.193	−2.72**
TRAIN_MONTHS	−0.007	−0.43	−0.009	−0.16	0.014	1.27	0.043	0.83
TRAIN_HOURS	−0.029	−1.54	−0.127	−2.05**	−0.014	−0.89	−0.047	−0.86
TRAIN_PROB	0.018	0.18	0.019	0.31	−0.053	−0.58	0.003	0.06
EXP	0.000	0.32	0.031	0.51	−0.000	−0.28	−0.044	−0.79
PERF_WINNER	−0.001	−0.36	−0.025	−0.42	−0.003	−1.12	−0.063	−1.16
PERF_ABS	0.000	0.98	0.083	1.20	0.001	1.13	0.083	1.36
POST	—	—	—	—	0.130	0.92	0.052	0.96
FEMALE	0.605	2.69***	0.152	2.45**	0.198	0.79	0.043	0.78
AGE	0.337	0.60	−0.000	−0.00	0.029	0.49	0.273	0.73
AGESQ	−0.000	−0.70	−0.040	−0.10	−0.000	−0.16	−0.145	−0.39
EDU	−0.052	−1.04	−0.051	−0.83	−0.017	−0.39	−0.0152	−0.28
INC	−0.013	−0.38	−0.025	−0.37	−0.031	−1.08	−0.063	−1.03
Intercept	—	—	6.697	1.92*	—	—	7.191	2.27**
(Pseudo)R^2	0.079		0.210		0.129		0.377	
LL	−378.8		—		−425.68		—	
F	—		4.55		—		8.65	

Note. $n = 241$. LL = likelihood. Unstandardized ordered probit (OP) and standardized coefficients ordinary least squares (OLS) reported, respectively; OP models estimated with robust standard errors.

*$p < 0.1$. **$p < .05$. ***$p < .01$.

more important to triathletes. Even if absolute performance does not affect their happiness level, it is still possible that they have met their own personal time goals and are satisfied with the race. This notion is supported by the positive effect of rank in the triathlete's age-group, which is significant in Models 3 and 4, rejecting Hypothesis 2. At first glance, this effect is counterintuitive because the natural assumption would be *the better the rank, the happier the triathlete*. However, this finding indicates that particularly participants finishing relatively poorly in their age-group were happy in the weeks after the race, suggesting that simply finishing the race might have been more important to them than their performance relative to other competitors (Stoeber et al., 2009).

Turning to torture during the race, the results show that triathletes who frequently thought about quitting during the race reported significantly lower happiness levels when crossing the finish line. However, the effect is insignificant in the models for happiness in the weeks after the race. Interestingly, mental torture during the race and in the training period significantly decreases happiness in the weeks after the race, while physical torture increases happiness, but the effect is insignificant. This finding suggests that physical torture was anticipated, while the level of mental torture might have been underestimated by triathletes. Meanwhile, unforeseen incidents that occur during the race are mentally challenging and detract from expectations of performance and happiness. Such incidents can include, for example, losing the goggles when swimming, getting kicked, or being pulled under water by other competitors during swimming, a flat tire on the bike, issues with nutrition or dehydration, stomach cramps, muscle cramps, and so on—all things that make it mentally tough to keep going. Consequently, Hypothesis 3 can only be partially confirmed for mental torture, but not for physical torture.

Likewise, mental torture during the training period negatively affects happiness in the weeks after the race, while the effect of physical torture is insignificant. Hence, Hypothesis 4 is partially confirmed for mental torture. Similar explanations can be advanced—physical torture might have been expected, while unforeseen circumstances, like injuries, might have been mentally challenging because they negatively influence their preparation and might put individual goals at stake.

Opportunity costs of time in terms of the number of training hours in load weeks have a negative effect on happiness when crossing the finish line, but only in Model 2. This finding is contrary to the assumptions of prospect theory: Why would one invest a lot when there is not a reward? The number of months respondents trained for the long-distance triathlon is insignificant. Monetary opportunity costs in terms of triathlon-related expenditure do not affect happiness, indicating that Hypothesis 5 must ultimately be rejected. Although triathletes spent more than 8 months preparing for this competition including more than 14 hr of training in load weeks, this preparation period does not affect their happiness levels. Nevertheless, these findings are in line with previous research indicating that obsessive passion in sport does not lead to positive emotional outcomes (Stenseng, Forest, & Curran, 2015).

Conclusion

This study investigated the determinants of happiness of long-distance triathletes when they cross the finish line and in the weeks after the race to understand whether happiness can be considered a reward for torture during the preparation period and the actual race. The results indicate that frequent thoughts about giving up and mental torture during the race and during the training period negatively affect happiness. Satisfaction with race outcome reflecting the extent to which individual goals, like simply finishing the race or meeting specific time goals, have been achieved has a significant positive effect on happiness. This effect is larger than any physical or mental torture or any opportunity costs and seems to make the participation decision a rational one. This study contributes to the behavioral economics literature with the employment of prospect theory in a real-world setting rather than a controlled experimental setting. It also extends prospect theory by applying it to a research area beyond financial decisions.

However, the inferences drawn here are not without limitations. Specifically, the study suffers from a relatively small number of observations because of missing responses in the survey. Although long-distance triathletes are only a subgroup within triathlon participants, future research should try to draw larger samples, maybe also of other extreme sports athletes, in order to check the robustness of the results of this study. Moreover, future research would benefit from a more detailed assessment of athletes' goals and their level of goal achievement. Future studies may also adjust the research design in the sense that focusing effects are less of an issue and that the study is less memory-dependent. For example, a natural experiment may be set up around a specific long-distance triathlon event, with accompanying surveys 1 week prior to the event, 1 day after, and 1 week after the event, but with compromises regarding anonymity of participants in mind.

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Notes

1. Ironman is a registered brand in triathlon. There are two types of Ironman races, the normal Ironman (long-distance race) and the Ironman 70.3 (half long distance; 1.9 km swim, 90 km bike, and 21.1 km run). Thus, not every long-distance triathlon is an Ironman race. Ironman races have qualifying slots for the Ironman World Championships on Hawaii that are held every October.
2. Mountaineering because of its severe physical demands bears some resemblance to triathlons; however, it is not an explicit competition. The utility functions, including goal setting, are self-realized entirely independent of reference to others.
3. However, there is also literature providing evidence on counterfactual thinking and satisfaction: For example, bronze medalists appeared happier on television than silver medalists because they compared themselves to fourth place finishers who did not win a medal, while silver medalists compared themselves to gold medalists (Medvec, Madey, & Gilovich, 1995). Moreover, silver medalists are more likely to be disappointed because of higher expectations (McGraw, Mellers, & Tetlock, 2005). Given our sample structure where most athletes have finished far away from the podium, these aspects might be less relevant.

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