Mental Preparation Techniques and Accomplishment of Race Goals by Ironman Triathletes: A Qualitative Investigation

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Abstract: The Ironman triathlon is a rapidly growing sporting event worldwide but little research has been found on the psychological processes employed by its participants. The purpose of this study is to discover which mental skills the Ironman participant population is utilizing during training and how these skills are seen to influence accomplishment, or lack of accomplishment of race goals. A purposeful sample of five Ironman participants was interviewed and transcriptions will be analyzed utilizing qualitative analysis. Five main mental skill themes were discovered: (1) preparation, (2) self-efficacy through previous experience, (3) choice of focus, (4) breaking down the race and (5) camaraderie. From these main themes, subthemes were discovered within two of the main themes. In preparation: (1) having a schedule/plan, (2) visualization and (3) being prepared for adversity. In choice of focus: (1) distraction/outside factors, (2) positive thoughts/motivation, (3) outcome/focus on finish, (4) "run my race"/self-focus and (5) calming/relaxation. Additionally, regardless of accomplishment of goal, all five participants showed themes of their mental preparation having a positive influence on their racing. From these themes, research may be conducted to determine the effectiveness of specific mental skills and possible interventions that can be implemented.

Key words: Ironman triathletes, mental preparation, ultra distance, mental skills.

1. Introduction

In the past 10 years, triathlon participation in the United States has increased six-fold from 1,000 to 135,000 [1]. Triathlons are typically organized in one of three formats: sprint, Olympic, and ultra-distance. The Ironman is currently the most popular type of ultra-distance triathlon in the United States. Nearly 17% of all triathletes, around 23,000 individuals, participate in Ironman races. The Ironman triathlon is a 2.4 mile swim, 112 mile bike and 26.2 mile run and can take an average of 8 to 17 hours to complete [1]. Being such a strenuous competition, it is imperative for Ironman triathletes to be at peak physical and mental condition.

With the Ironman Triathlon being developed within the past 35 years, very little research has been conducted regarding the mental skills used by Ironman triathletes. However, much of the research done with various types of endurance athletes suggests several psychological skills that may benefit performance when employed during training and competition. Examples of such psychological skills include: associative attentional focus, positive self-talk, goal setting, mindfulness, self-efficacy, and use of personalized motivational scripts [2-6].

Cognitive focus has been consistently shown to affect performance endurance in ultra-endurance athletes [7]. Morgan and Pollock and Masters and Ogles found that an associative attentional focus, or focus on internal performance-related items, was commonly used by elite endurance runners [5, 8]. Conversely, they found that slower runners tried to distract themselves by using dissociative techniques like focusing on external items (i.e. scenery, singing a song in their head.)

Baker, Côté, and Deakin found similar results with

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ultra-distance triathletes during races [9]. It was discovered that expert ultra-triathletes experienced performance related thoughts (86% active and 15% proactive) during the starting and finishing segments of their races [9]. Triathletes who finished in the middle and back of the pack were less likely to have active, performance specific thoughts (62% and 56% respectively) and experienced passive thought patterns (32% and 29%). Different types of cognitions were prevalent at specific parts of a triathlon (i.e. transitions into the next race component), which is something unique to this type of event [9]. One limitation of this research is that the researchers did not mention if these techniques had been developed and applied during the training process.

One type of mental skill that often accompanies an associative attentional focus is the use of positive self-talk [4, 7]. Self-talk can be used to keep an athlete's attention focused in the present [10]. Moreover, researchers have found positive self-talk to increase performance [11], particularly with endurance cyclists [3]. Both self-regulated and assisted positive self-talk had a "beneficial impact on endurance performance" [3]. Goal-setting is another psychological skill that enhances athletic performance. In a meta-analysis, researchers found that 78% of the studies they reviewed showed a moderate to strong effect of goal-setting in sport [12].

Stoeber and colleagues examined how achievement goals and personal goal-setting predicted race performance in Half-Ironman participants [13]. Not only did the triathletes who set their own goals (as opposed to having the goals set by a researcher) perform better, those who set more challenging goals (faster times, higher ranks) performed better than those who set less challenging goals. Researchers concluded that "personal goal setting mediated the relationship between performance-approach goals and race performance supporting…that the effects of achievement goal orientation on performance are mediated by setting specific goals" [13].

What Mental Skills Ironman Triathletes Need and Want is one of the most influential pieces of research on the mental skills of ultra-distance triathletes [14]. The purpose was to identify how many triathletes were currently using mental skills and which skills they wished to develop. A staggering 97% of those interviewed responded strongly or very strongly when asked "How important do you believe that mental skills are in Ironman training and racing?" That being said, only 37% of the same sample said they practiced a form of sport psychology in training and only, 27% utilized it in races [14]. This disparity in the number of athletes who believe mental skills are important and those who actually practice mental training is interesting and needs to be examined. One potential explanation for this difference is the Ironman triathletes' lack of knowledge about how to properly employ certain mental skills. In that regard, Grand'Masion identified several skills which the ultra-triathletes wished to improve upon. Included were keeping focus to improve level of performance, becoming and staying positive and how to set and adhere to goals [14].

Researchers have shown that mental training positively influences performance in ultra-distance sport, yet, despite their knowledge of its importance, few Ironman triathletes are currently using mental skills in race preparation. Little research has been conducted on the mental skills which are successfully being used by Ironman triathlons and, more specifically, how these skills are being implemented before a race. Even less emphasis has been placed on the influence mental skills have on accomplishment of race goals.

The purpose of this study was to describe the mental preparation techniques of Ironman triathletes before a race and how these triathletes felt this preparation affected their accomplishment of race goals. There are two research questions this study addresses: (1) What type, if any, of mental preparation techniques are used by Ironman triathletes and (2) How

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do Ironman triathletes feel their mental preparation contributed to their accomplishment (or lack of accomplishment) of race goals? It is believed that a more thorough insight into the types of mental preparation techniques being utilized by Ironman triathletes will give researchers and sport psychology consultants a better perspective in terms of intervention development.

2. Method

2.1 Participants

This study included five individuals who were competing in an Ironman triathlon during the time of the study (Table 1). Participants were purposefully chosen in order to ensure all participants would meet the criteria of the study and could provide sufficient information from which to draw meaningful conclusions. All participants competed in an Ironman triathlon within the time of the study and were not excluded based on experience or talent level. Participants were contacted personally through either the head researcher or other members of the research team. Telephone and email communication was used to request participation.

2.2 Instrumentation

With qualitative research, the researcher is the primary instrument in obtaining information through interviews, discussions, and/or observations [15]. Therefore, it is important to ensure measures are taken during the interview process to become aware of all researcher biases. Methodological triangulation was used to ensure researcher bias was eliminated. The head researcher conducted interviews which were recorded on a digital recorder while simultaneously taking notes of key points in a journal. Following the interviews, transcription occurred onto a computer and all files were kept confidential.

In order to obtain this thorough information, the exploratory nature of a qualitative analysis was appropriate. Within this framework, the study was conducted through the grounded theory approach. In grounded theory "the researcher attempts to generate or discover a theory of a process, action or interaction grounded in the views of the research participants…research involves multiple stages of data collection and refinement of abstract categories of information" [16]. Understanding the processes and context the participants experienced and by maintaining a flexible methods design with appropriate interpretation, the researcher believed the data would correctly address the research questions.

2.3 Procedure

Two pilot interviews were conducted to ensure the questions were not leading and would provide adequate information. The researcher then contacted potential participants by email to see if they were willing to participate. This contact information was obtained through resources of the head researcher or members of the research team. At the time of agreement to interview, the researcher obtained participant's consent officially and informed them of measures of confidentiality that would be taken. Confidentiality consisted of names not being used in transcriptions or publications, and interviews not being accessible by anyone but the research team. A pre-race interview was then scheduled to be conducted within one week of

Table 1   Description of participants.

Participant	Age	Gender	Number of Previous Full Ironman Races
1	46	Male	none
2	38	Male	none
3	40	Male	3
4	36	Male	1
5	53	Male	2

competition. The participants were given an overview of the rationale behind the study and demographic information was collected at this time. These interviews were semi-structured, done over the phone, recorded digitally with notes taken manually on main points. Both pre-race and post-race interview questions were asked with probing questions when appropriate (Table 2).

2.4 Data Analysis

The methods of grounded theory analysis were used [17] for data collection and analysis. Following data collection, the interviews were transcribed verbatim and proof read for accuracy. This ensured none of the information was missing and that the interviews had been transcribed correctly. Once the accuracy of the transcripts was assured, the transcripts were stored on an external hard drive accessible only by the research team.

The researcher read and re-read interviews to obtain a solid understanding of the meaning of the transcripts. In doing so, the researcher was able to check for errors and to develop a holistic knowledge of the data presented. With a thorough understanding of all transcripts, reduction occurred, eliminating irrelevant, repetitive or overlapping data. Then coding and formation of categories occurred to release data meaning. "Raw data" was openly coded, where it was reduced and placed into subcategories and groups [17].

Next the researcher analyzed how each part of each interview related to the overall experience described by the participant and then compared interviews to "global themes". These themes were classified into categories and labeled so that the different parts of the data were accurately captured [15, 18]. Once these categories were fully developed, the researcher described the themes that emerged and implications about the data. Triangulation occurred in the form of (1) peer checking, in which other qualitative researches made sure they fully agreed with the conclusions developed, (2) expert checking, in which a supervisor of qualitative research made sure he fully agreed with the conclusions developed and (3) member checking, in which participants made sure they fully agreed with the conclusions developed. From these descriptions, the reader is able to understand the meaning behind the themes.

3. Results

All participants were competing in a full, USAT sanctioned Ironman triathlon within one week of the interviews.

This research was designed to answer two questions: (1) what type of, if any, mental preparation techniques are used by Ironman triathletes and (2) how do Ironman triathletes feel their mental preparation contributed to their accomplishment (or lack of accomplishment) of race goals? Following analysis, themes were discovered to answer these questions. Five main themes pertaining to this question were discovered: (1) preparation, (2) self-efficacy through previous experience, (3) choice of focus, (4) breaking down the race, and (5) camaraderie. From these main themes, subthemes were discovered within two of the main themes. In preparation: (1) having a schedule/plan, (2) visualization and (3) being prepared for adversity. In choice of focus: (1) distraction/outside factors, (2) positive thoughts/motivation, (3) outcome/focus on finish, (4) "run my race"/self-focus and (5) calming/relaxation. Each main theme was mentioned by

Table 2 Interview questions asked both pre- and post-race.

Pre-Race Questions	Post-Race Questions
What are the race goals you have set for yourself?	Did you accomplish your race goals?
Describe what you have done to mentally prepare for this Ironman triathlon.	How do you feel your mental preparation influenced your accomplishment/lack of accomplishment of these goals?
What types of mental skills do you utilize during Ironman triathlon training?	

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Table 3 Listing of themes and subthemes.

THEMES	
Main Theme	Subthemes
Preparation	Having a schedule/plan
	Visualization
	Being prepared for adversity
Self-efficacy through previous experience	
Choice of focus	Distraction/outside factors
	Positive thoughts/motivation
	Outcome/focus on finish
	Run my race
	Self-focus
	Calming/relaxation
Breaking down the race	
Camaraderie	

each participant and all subthemes were mentioned more than once and deemed specifically significant by the participants (Table 3).

4. Discussion

It was found in the interviews that many mental preparation techniques were used by Ironman triathletes. While each participant had a unique way of implementing these techniques and then describing them through the interview process, there were five main themes found to be used by all participants. The five themes are discussed in conjunction with previous research and future research suggestions.

4.1 Preparation

Participants experienced both physical and mental planning techniques throughout their training in order to feel prepared for their upcoming race. Many times this came in the form of following a training plan, which established confidence in their physical abilities. "I set a plan from day one and I follow the plan that I am confident in the plan and that helps me mentally, builds my confidence in what I am doing is going to get to my end results, my goals." (Participant 4).

This was similar to the sport psychology skill of goal mapping. As found in a meta-analysis, goals have four functions [19]. The directive function is one that is applicable to the planning and preparation process the Ironman triathletes experienced. The directive function explains "they (goals) direct attention and effort toward

goal-relevant activities and away from goal irrelevant activities" [19]. By following a specific training plan, the participants were able to specifically direct their efforts in a methodical way toward their race goals. By using a training plan, and then a racing plan, the participants were effectively directing their attention to the goal at hand (i.e. preparing for the race). The participants felt confident about their abilities to race because their efforts had been correctly distributed over the course of training and preparation. The effectiveness of goal-setting is supported by previous research [20].

Additionally, visualization was stated as a preparatory skill implemented by the participants. "I have visualized various aspect of the race, especially the part that generally give me a little bit of trouble or where I know that I generally have some physical or mental issues." (Participant 2). The term visualization was used by the participants to explain the skill. In many instances they were using imagery, incorporating more senses than just the visual component i.e. "I do try to visualize myself with good form, feeling good, being strong and in control, throughout the run and I try to really think about what that feels." (Participant 2). With regard to preparation, imagery has been found as a way to effectively prepare yourself, both body and mind, for a future event. By imaging the race experience in their minds, the participants were creating and living the race experience ahead of time, building confidence and seeing themselves effectively

coping with adversity.

Pre-planning as a way to handle adverse sport situations is also a well-known concept and was frequently mentioned by the participants. Most of the participants knew which specific areas of the race would be most challenging for them and planned accordingly.

I knew that there was going to be a time where I was not going to feel good, things were not going to work out exactly the way I wanted, but you expect it; if they are going to happen 'okay here it is I know this would happen I'm fine and keep going…when it happens, no big deal, just keep going." (Participant 1).

Inherent in an ultra-distance race like an Ironman, it would be virtually impossible to compete in a race for 17 hours without a single setback or adverse situation. In acknowledging this, the participants began to mentally prepare for the unavoidable difficulties of the race. This planning is supported by a study with Olympic athletes who, when failed to plan for adversity, were three times more likely to not meet their outcome expectations [21]. With the Olympians, similar to the Ironman triathletes, having a plan developed as a way to recover in the face of adversity, provided them with the knowledge and confidence to overcome it and succeed. Furthermore, athletes who use psychological skills have been found to develop a stronger resiliency profile to help cope with adversity [22].

4.2 Self-Efficacy through Previous Experience

The theme of self-efficacy through previous experience served as a source of confidence to the athletes and reassured them that they were capable of accomplishing their goals.

The fact that I had done this before that I have already accomplish, that I have already done two Ironman and the fact that that knowledge certainly helped because that gave me confidence in knowing that I could do it. So even when it got difficult and hard and when I wasn't physically up to par for the challenge I knew mentally I could carry through

because I have done this before and I had to believe in my abilities to do it. (Participant 5).

This theme is in clear support of Bandura's self-efficacy theory [23]. In this theory, self-efficacy is derived from four different sources with performance accomplishments perhaps being the most dependable. "This source of efficacy information is especially influential because it is based on personal mastery experiences. Successes raise mastery expectations [23]. In a study of self-efficacy with marathon runners, past experience was found to be one of the most salient sources of self-efficacy when running [24]. With all participants in the present study having had at least similar racing experiences (i.e. other Ironman's, Half Ironman's, marathons, etc.), they had the "personal mastery experiences" Bandura mentioned. These past experiences and successes allowed participants to develop self-efficacy manifesting in race confidence.

4.3 Choice of Focus

The participants commonly cited what they chose to focus on during training and during the race as a mental skill. This included external focus and distractions, focusing on the finish, motivation, relaxation, and positive thoughts. While they focused on a variety of things at various times, the commonality was having control of the focus and knowing where to direct it. The participants' areas of focus, while broad, all seemed to fit into the mental skill of self-talk, which can be used as a way to regulate where one is focusing. "First I had written down on my arm, I had somebody write down Strength, Power and Focus and those were the things that I wanted to focus on throughout the day, focus being the keyword" (Participant 3). The use of self-talk by athletes has been found to improve overall athletic performance [25].

While only one participant identified what he was doing as self-talk, all of the subthemes (aside from distraction, or in other words striving for the absence of self-talk) can be identified as self-talk. The use of self-talk by the participants is consistent with Hardy,

Gammage, and Hall's theoretical framework of why athletes use self-talk [26]. In this framework self-talk is divided between cognitive and motivational types. The types of self-talk used by the participants all fell into the motivational category. The motivational category can be further broken down into subcategories which embody the sub themes found in choice of focus: maintaining drive, increasing drive, encouragement, and reaching potential (positive thoughts/motivation), goals (focus on finish), self-confidence, control and mental readiness (self-focus), and relaxation (calming/relaxation) [26].

4.4 Breaking Down the Race

The participants indicated that thinking about the entire race as one goal was too overwhelming and complicated to comprehend without losing confidence or feeling anxious so they broke the race down into separate parts. "Always think in terms of small increments or small goals, never think about the entire race…on the swim I am only going to the next buoy, on the bike I am only getting to the next aid station…I am not running 26 miles, I am running a mile, just happens to be 26 times." (Participant 2).

By breaking both longer training sessions and the race down into small, more manageable increments, the participants' perception was changed to that of completing a much more manageable task. While each participant had an outcome goal, research indicates the importance of setting process goals that work toward the outcome goal [27]. "The benefits of adopting an outcome goal are realized only when the outcome goal is combined with the prioritization of a "process orientation" immediately before, and during performance" [27]. Goal-setting, even to the point of perfectionistic standards, have been found to help athletes achieve optimal performance when the task at hand is not unexpected or foreign [13].

Maintaining a process orientation is important because increased competitive state anxiety and decreased attentional focus often result from focusing

solely on outcome goals [27]. This idea of anxiety induced by focusing solely on the outcome goal of finishing the race is consistent with what the participants were experiencing. By shifting focus from an overwhelming outcome goal which could produce anxiety and lack of focus, the participants used a process goal orientation in order to "break down the race".

4.5 Camaraderie

For the participants, social support was mentioned as making training and racing easier, as well as providing a positive sense of moral. This support was found in many forms, including other triathletes, family, and friends. Each participant had a slightly different way in which this camaraderie and social support manifested, which coincides with a previous study demonstrating social support as being multi-dimensional in nature [28]. The types of support outlined in Rees and Hardy's framework experienced by the participants include emotional, esteem, and tangible support. Emotionally, family and friends were there to help deal with sport specific worries and problems, as well as on-site (race day) concerns [28]. Social support has also been found to improve athletes' longitudinal perceived well-being [29].

Esteem support for the participants was found in other competitors, whether in training partners: "I train with a group, so there is a camaraderie aspect; you know that helps mentally through our workout." (Participant 2 describing fellow racers)

But I kept with this guy who was having a difficult time himself and we decided to do the last 13 miles together. So what we did do is we kept talking to each other and encouraging each other and telling each other stories and talking to each other, telling each other different things to get off thinking about what we were doing, thinking about other things instead and also, you know, pushing each other" (Participant 5).

This esteem support fell in line specifically with the encouragement, motivation, and help at competition

components of Rees and Hardy's framework [28]. Finally, tangible support was seen by the participants in the form of surprise notes along the course from family as well as special needs bags that would be categorized as reducing worries about practical matters [28].

4.6 Mental Preparation and Goal Accomplishment

Participants, regardless of accomplishment of goal, showed themes of their mental preparation having a positive influence on their racing. All participants expressed awareness of their use of mental skills in training and racing, as well as acknowledging the importance of goals in the Ironman process.

I think it really helped. You know once literally within 2 minutes of being on a bike ride I had a flat tire, as I said, really, is that how this race is going to go? And it just seemed like things just kept coming, coming and coming, I said, I cannot control these things and I kept the focus, but my focus was nothing could break my spirit that day, so if there wasn't any perfect day, I was still going to finish the day and have a good time, but I just dealt with that in the moment I guess, but my mental aspect was right, I could only do what I could do with the training that I had and my mental aspect was there, I mean that is for sure." (Participant 3)

This pertains to the article *What Mental Skills Ironman Triathletes Need and Want* [14]. Grand'Masion found 97% of those interviewed responded strongly or very strongly when asked "How important do you believe that mental skills are in Ironman training and racing?" Surprisingly, she found in the same sample only 37% said they often practiced a form of sport psychology in training and only, 27%, utilized it in races. This was not represented by the participants of the current study. It is possible that the Ironman triathletes in this study may not have been knowledgeable regarding what constitutes a mental skill or how to properly employ certain mental skills, even though they were being used [14]. This could explain the discrepancy between the current and former studies. However, utilizing mental skills, such

as goal-setting, self-talk, positive affect, etc. have been found to improve athletic performance [30-32].

4.7 Implications and Limitations

The findings of this research contribute to the knowledge about the mental preparation techniques utilized by Ironman triathletes and the perceived importance of these skills. While multiple themes were uncovered, there is still a need for further research on this topic. It can be suggested that each individual mental skill could be examined in terms of impact on an Ironman triathlete's training and racing. In addition, the present study utilized only male participants who were competing in the same race and were all members of the same triathlon club. It is possible that literature or even simple conversations about mental skills used in Ironman training and racing could have reached each participant in similar forms, and therefore influenced their choice of skills utilized. Additionally, themes which were discovered with regard to having a positive association with the use of mental skills may also be due to the participant selection; those who volunteered to be asked about their use of mental skills may use them more frequently or may value them more. Because of this, it can be suggested to conduct research on a more diverse population.

An additional limitation of this research is the inherent concern which comes with an interview targeting accurate descriptions of memories. While it is possible that only the most influential mental skills were used by participants were discussed during the interviews, this also means their lists were not exhaustive. With recall there is an element of delay, especially with regard to the post-race interview. All participants claimed their mental preparation had a positive influence on their racing, but this realization may have come after the fact when given time to contemplate the use of mental skills, especially knowing they would be asked questions on it later.

Coaches, sport psychology consultants, and Ironman triathletes may be able to apply the practical aspects of

these findings. Because participants cited mental skills which they believe to be helpful, the skill themes could be used as a starting point for triathletes looking to add mental training to their physical training. Furthermore, with all participants attributing at least some of their racing success to their use of mental skills, the importance of making it a component of their preparation is reinforced.

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