

**An Analysis of the Components of Mental Toughness in Sport**

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A Dissertation Submitted to the Graduate Faculty  
of Virginia Polytechnic Institute & State University  
in partial fulfillment for the degree of

DOCTOR OF PHILOSOPHY

In

Curriculum and Instruction

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November 14, 2005

Blacksburg, Virginia

Keywords: Mental Toughness, Persistence, Perseverance, Mental Skills Training

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## **(ABSTRACT)**

Many coaches are becoming aware of the importance of developing mentally tough performers and are designing programs to develop it in their athletes. One of the most significant problems in designing these programs is the inconsistency in the definition and description of mental toughness. If programs are to be designed with the goal of developing mental toughness in athletes, the components of the construct must be identified.

Based on the advantages that mental toughness can offer to the performer, this study was designed to develop an understanding of the components of mental toughness in sport. The purpose of this study was to identify the components of mental toughness as perceived by National Collegiate Athletic Association (NCAA) coaches and was guided by two fundamental questions: what are the essential components of mental toughness? and to what degree are these components teachable (trainable).

Twenty-two NCAA coaches were selected to participate from a mix of Division I, II, and III male sports teams. The procedures for this study were divided into a two-phase approach. Phase One consisted of each participant completing a questionnaire for the purpose of evaluating the importance and teachability (trainability) of 20 separate components of mental toughness. Phase Two consisted of follow-up, semi-structured interviews that provided further insight into the perspectives of the participants.

The results of this study indicated the essential components of mental toughness based on their importance to the construct. The results also indicated the degree of teachability (trainability) of each component. A unique relationship between teachability and trainability was also revealed in this study. These findings provide a better understanding of the components of mental toughness and support the need for its development in sport.

## **DEDICATION**

To God, for giving me strength and guidance.

To Mom and Dad, for your never-ending motivation and inspiration.

To my Sister, for being there when I needed you.

To my Wife, for being my best friend, and my constant source of support and encouragement.

To my Daughter, for your incredible hugs.

**WE DID IT!**

## **ACKNOWLEDGEMENTS**

I am extremely grateful and owe a great debt to the members of my doctoral committee: Dr. Richard Stratton (chair), Dr. Kerry Redican, Dr. Gary Bennett, and Dr. Gary Whitt. You have all been a great source of knowledge and encouragement. Dr. Stratton, I thank you for your tremendous support and guidance through this process. You always found the time to answer my endless questions, give direction or just calm me down. Dr. Redican, I thank you for your assistance throughout this entire process, but mostly for helping me get it started. You motivated me to “just get going” and I thank you for that. Dr. Bennett, your knowledge and experience was invaluable on this project, not to mention your red pen. Dr. Whitt, thank you for allowing me to interrupt you on a daily basis. Your advice and suggestions added more to this project than you will ever know.

Finally, I would like to thank the coaches that participated in this study. This study could not have been completed without your valuable experiences and insight into mental toughness.

Thank you all very much!

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# CHAPTER 1

## INTRODUCTION

Coaches and athletes alike are searching for competitive advantages. This search has typically led to the development of physical or technical training programs. Many coaches and athletes have become aware of the importance of mental skills in sport and are placing more emphasis on the development of these skills. The development of these mental skills is not only important for those with the desire to win, but for those with a desire to become more consistent performers.

Upon reviewing the literature on mental skills, mental toughness consistently emerged as one of the most important psychological characteristics of sport. The literature clearly shows that mental toughness is imperative for peak sport performance. Gould, Hodge, Peterson, and Petlichkoff (1987), Gould, Eklund, and Jackson (1993a), Williams (1998), and Gould, Dieffenbach, and Moffett (2002), all state that mental toughness is an important psychological characteristic of sport performance. Unfortunately, many acknowledge the importance of mental toughness, but few fully understand it. “While athletes and coaches often talk about mental toughness, seldom has it been precisely defined” (Gould et al., 2002, p. 199). Coaches and athletes use this term daily without a clear understanding of its components or what it means to be mentally tough. “The term mental toughness is probably one of the most used, but least understood terms used in applied sport psychology” (Jones, Hanton, & Connaughton, 2002, p. 205).

The lack of clarity and consistency regarding mental toughness is due, in part, to a significant gap in the literature. Many popular literature sources such as Loehr (1986) and Kuehl, Kuehl, and Tefertiller (2005), attempt to define and develop mental toughness programs. These sources provide inconsistent descriptions of mental toughness, not essential components. The empirical research on the construct of mental toughness is very sparse. In fact, Jones et al. (2002) is the first empirical source that attempted to identify the components or attributes of mental toughness or a construct surrounding mental toughness. In 2002, Jones et al. recognized the need for clarification of mental toughness and attempted to define and identify the attributes of mental toughness as perceived by ten elite sport performers. This empirical study resulted in a definition of mental toughness and the identification of 12 attributes of a mentally tough performer.

In 2004, Cal Ripken, whom most would recognize as a mentally tough performer, identified eight characteristics of an individual who demonstrates perseverance (Stratton, 2004). During Cal Ripken's career he played 2,632 consecutive games which set the longest consecutive-games played streak in major league baseball history, breaking Lou Gehrig's record of 2,130 consecutive games. Ripken's professional accomplishments make him an ideal source to suggest the components of perseverance. A combination of the characteristics from these two sources will provide a starting point for this study.

Another contributor to the lack of clarity regarding this topic is a result of the term mental toughness being used synonymously with other constructs such as persistence, perseverance, resiliency, and hardiness. This lack of clarity has increased the confusion regarding mental toughness and results in wide interpretations (Jones et al., 2002).

Currently there is much concern and debate over whether these mental skills or psychological characteristics are teachable (trainable). There is no conclusive empirical research that shows that psychological characteristics are inherited. This study allowed each individual coach to decide to what degree the psychological characteristics of mental toughness are teachable or learned through practice.

### **Purpose of the Study**

Based on the advantages that mental toughness can offer to the performer, this study was designed to develop an understanding of the components of mental toughness in sport. The purpose of this study was to identify the components of mental toughness as perceived by National Collegiate Athletic Association (NCAA) coaches. The direct research and literature of the construct of mental toughness is scarce and inconsistent. This lack of clarity regarding the most appropriate construct or the components of this mental skill has resulted in wide interpretations and confusion (Jones et al., 2002).

This study used a combination of qualitative and quantitative methods to identify the components of mental toughness. The identification of these components allowed for further clarity and consistency regarding mental toughness and provided further information needed for defining the construct and designing programs to develop the construct.

## **Research Questions**

In order to further investigate the construct of mental toughness, the following questions were developed to guide this research:

1. What are the essential components of mental toughness as perceived by NCAA coaches?
2. To what degree do NCAA coaches perceive the components of mental toughness to be teachable (trainable)?

## **Delimitations**

1. The sample size for this study was limited to 22 participants due to the use of both quantitative and qualitative research methods.
2. This study also required a minimum of 10 years of coaching experience. This was done to ensure a sufficient amount of experience with college athletes as well as knowledge of the concept.

## **Significance of the Study**

If programs are to be designed with the goal of developing mental toughness in athletes, the components of the construct must be identified. There is currently minimal scientific analysis of the topic and very little literature written concerning this topic. In fact, Jones et al. (2002) and Stratton (2004) are the only current sources that directly address the components of mental toughness. Until there is an understanding of the desired components of mental toughness, it can not be appropriately defined or developed.

## **Definition of Terms**

The following terms are presented as defined by Thorndike and Barnhart (1988) unless otherwise specified:

Hardiness – endurance; strength.

NCAA – National Collegiate Athletic Association; The divisions of NCAA (I, II, III) are determined by multiple factors, one of which is the ability to provide or the amount of scholarships that can be offered (T. S. Parker, Personal Communications, November 14, 2005).

Perseverance – a sticking to a purpose or an aim; never giving up what one has set out to do.

Persistence – not giving up, especially in the face of dislike, disapproval, or difficulties.

Resilience – Power of recovering quickly.

## CHAPTER 2

### REVIEW OF LITERATURE

#### *Mental Toughness*

Many coaches are becoming aware of the importance of developing mentally tough performers and are designing programs to develop mental toughness in their athletes. One of the most significant problems in designing these programs is due to the inconsistency in the definition and description of mental toughness. In fact, Gould et al. (1987) conducted a study in which 82% of coaches rated mental toughness as the most important psychological attribute or characteristic in determining success in wrestlers. Unfortunately, the results also showed that only 9% of those same coaches had been successful in developing mental toughness in their athletes. "The general lack of clarity and precision surrounding the term mental toughness is unfortunate, since it is arguably one of the most important psychological attributes in achieving performance excellence" (Jones et al., 2002, p. 206). Mental toughness is a term that is used daily in physical activity without a clear understanding of its meaning or components. This lack of clarity regarding the definition and the desired attributes of mental toughness has resulted in wide interpretations and confusion (Jones et al.). Much of the confusion is a consequence of the failure of previous literature to distinguish between mental toughness and the attributes of mental toughness (Jones et al.). In an attempt to address this lack of clarity, a study was done in 2002 by Jones, Hanton and Connaughton. The purpose of this study was to conduct an investigation which attempted to define and identify the key attributes of mental toughness (Jones et al.). This study utilized qualitative methods in order to probe the athletes and establish detailed information. Using purposive sampling, 10 international elite athletes were chosen to participate in this study. The study was divided into three stages. The first stage was a focus group of three of the athletes with the objective of defining and listing the necessary attributes of the ideal mentally tough athlete. Stage Two consisted of individual interviews with the remaining athletes regarding the definition and attributes of mental toughness. Finally, the collective definitions, attributes, and any additional commentary like the following, were reviewed:

The researchers then arrived at an agreed definition that embraced all of the factors and key elements emerging from the focus group and interviews. The definition and attributes

of the ideal mentally tough performer were then distributed to all of the participants who were first asked to rate the extent to which they agreed with the definition on a scale from 1 (not at all) to 10 (totally agree). The participants then rank-ordered the attributes in terms of their importance to the ideal mentally tough performer (with 1 being most important and 12 being the least important) (Jones et al., 2002, p. 209).

The definition that resulted from this study is as follows:

“Mental toughness is having the natural or developed psychological edge, that enables you to generally cope better than your opponents with the many demands (competition, training, and lifestyle) that sport places on a performer, and specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure” (p.209). The researchers also concluded that mental toughness provided the performer a psychological advantage over opponents (Jones et al.).

The resulting 12 attributes were rank ordered by the participants based on their perception of each attribute’s importance to the ideal mentally tough performer and are as follows (Jones et al., p. 211):

1. Having an unshakable self-belief in your ability to achieve your competition goals.
2. Having an unshakable self-belief that you possess unique qualities and abilities that make you better than your opponents.
3. Having an insatiable desire and internalized motives to succeed.
4. Bouncing back from performance set-backs as a result of increased determination to succeed.
5. Thriving on the pressure of competition.
6. Accepting that competition anxiety is inevitable and knowing that you can cope with it.
7. Not being adversely affected by others’ good and bad performances.
8. Remaining fully-focused in the face of personal life distractions.
9. Switching a sport focus on and off as required.
10. Remaining fully focused on the task at hand in the face of competition-specific distractions.
11. Pushing back the boundaries of physical and emotional pain, while still maintaining technique and effort under distress (in training and competition).

## 12. Regaining psychological control following unexpected, uncontrollable events (competition specific).

The resulting information addressed two fundamental issues surrounding mental toughness: “how can it be defined? And what are the essential attributes required to be a mentally tough performer?” (Jones et al., 2002, p. 205) “The definition of mental toughness and the essential key attributes of the mentally tough performer that emerged from this study represent a starting point for the scientific investigation of mental toughness” (p. 215). Jones et al. is the first empirical study to be conducted with the purpose of defining and identifying the attributes of mental toughness. Based on this study, efforts to expand this research should continue in order to provide the necessary information for the design and development of effective mental toughness programs.

In an effort to provide further clarity to this topic, a more recent study of mental toughness was done in 2005 by Bull, Shambrook, James, and Brooks. The primary purpose of this study was “to provide practical recommendations for coaches, which could be translated into concrete strategies, focused upon making a difference to coaching practice and ultimately the performance of English cricketers at the international level” (p. 211). This study identified two main objectives; 1) to develop a greater understanding of what mental toughness is within cricket, and 2) to identify how existing mentally tough English cricketers developed their mental toughness (Bull et al., 2005). The analysis of the qualitative mental toughness interviews resulted in the creation of several general dimensions, global themes, and structural categories. These were designed to show the specific relationships involved in the development of mental toughness. The findings of this study revealed many similarities and provides further validity to the attributes that resulted from Jones et al. (2002).

### *Resilience*

It appears that researchers have recently become aware of the importance of filling the gap in the literature created by the lack of clarity in the constructs surrounding mental toughness. Resilience, perseverance, persistence, hardiness, and mental toughness have been used synonymously by authors, researchers, coaches, and athletes for decades. This has not only been a problem for those interested in sport performance but also for many others in psychology and sociology. In an attempt to clarify the construct of resilience, a study was conducted in 2000 by

Luthar, Cicchetti, and Becker. Due to concerns over the rigor of research in the area of resilience, the authors divided their concerns into four broad categories (p. 543): 1) ambiguities in definitions and terminology, 2) variations in interdomain functioning and risk experiences among resilient children, 3) instability in the phenomenon of resilience, and 4) theoretical concerns, including questions about the utility of resilience as a scientific construct. The authors then addressed each concern in an effort to clarify misconceptions and to propose recommendations for future study on resilience. In addressing these concerns, they concluded that “in future research, concerted attention must be given both to selecting and justifying strategies used to operationalize pivotal constructs” (p. 545). The authors also concluded that continuing research is warranted because varying definitions of constructs will result in varying conclusions and that clarity and consistency in the use of definitions and terminology of constructs is imperative (Luthar et al., 2000).

### *Perseverance*

Cal Ripken whose was nicknamed “Iron Man”, played 21 seasons with the Baltimore Orioles. During his career, he played 2,632 consecutive games, setting the longest consecutive-games played streak in major league baseball history, breaking Lou Gehrig’s record of 2,130 consecutive games. During his streak, Ripken played 8,243 straight innings from June 5, 1982 to September 14, 1987, making it over five years without a rest of any kind. Also, during seventeen of his twenty-one seasons, he played in consecutive All-Star games. Based on this record, I would expect that the majority of people, inside or outside of sports, would agree that Cal Ripken is a mentally tough performer. In 2004, Cal Ripken identified 8 characteristics of perseverance, a term used synonymously with mental toughness, that he felt contributed to his consecutive game streak. The following are the characteristics he identified (Stratton, 2004):

1. Take the right approach: always be ready to play.
2. Have a strong will to succeed: don’t let setbacks stop you from achieving your goal.
3. Have passion for what you do: love what you do.
4. Be competitive: it’s not just about beating your opponent. You have to internalize competitiveness and take pride in what you do.

5. Be consistent: recognize and adjust to change so that you are always able to make a contribution to your team.
6. Have conviction: you have to be a little bit stubborn.
7. Strength: You have to be in good physical and mental condition. You must be psychologically prepared.
8. Personal management: don't duck potential problems; take on the problems directly to prevent small problems from building into bigger problems.

According to Cal Ripken, these attributes or characteristics provide some specific insight into how athletes can achieve mental toughness.

### *Psychological Characteristics*

The review of the literature on psychological characteristics of sport performance clearly shows that mental toughness is imperative for peak sport performance. Gould et al. (1987), Gould et al. (1993a), Williams (1998), Gould et al., (2002) and Jones et al. (2002), all state that mental toughness is an important psychological characteristic of sport performance. "It appears therefore, that virtually any desirable positive psychological characteristic associated with sporting success has been labeled as mental toughness at one time or another" (Jones et al., 2002, p. 206). In an effort to identify the psychological characteristics of elite Olympic athletes, Gould et al. (2002) evaluated ten U.S. Olympic champions, ten coaches (one coach identified by each athlete) and ten parents, siblings or significant others (one identified for each athlete) in order to determine the psychological characteristics they possessed. This study was an extension of the research done by Csikzentimihalyi, Rathunde, Whalen, and Wong (1993), Hanton and Jones (1999), and Durand-Bush and Salmela (2001). The qualitative psychological characteristics results of this study show that champion athletes possess unique psychological characteristics such as ability to deal with anxiety, confidence, ability to set goals, mental toughness, etc. In fact, over 73% of the 30 participants identified mental toughness as a significant contributing psychological characteristic of performance success.

Athletes, coaches, and sport performance enhancement specialists have become very interested in identifying the specific psychological characteristics of successful athletes for obvious reasons. Therefore, the studies that have been conducted with the purpose of examining the link between psychological characteristics and performance success have become very

important. One such study was conducted by Golby and Sheard (2004). This study examined the psychological characteristics of 115 professional rugby players at three different levels of play and was conducted to give support to studies designed to identify and define specific psychological characteristics such as Gould et al. (2002) and Jones et al. (2002). The investigators measured mental toughness and hardiness using the Psychological Performance Inventory (PPI; Loehr, 1986). The attributes used in the measurement of mental toughness include:

- Self-confidence
- Negative energy control
- Attention control
- Visualization and imagery control
- Motivation
- Positive energy
- Attitude control

The results showed that these elite rugby players possessed high levels of both hardiness and mental toughness, although the measurements of hardiness were more significant. These results were also consistent with the previous research of Gould et al. (2002) and Williams and Krane (2001).

This study is valuable because it again, shows the importance of mental toughness in the performance of elite athletes. However, it shows the need for clarity and consistency in the definitions and characteristics of the constructs used to evaluate the participants.

Unique personal characteristics were also found to be important to performance in a study of expert athletic performers. Durand-Bush and Salmela (2002) examined the factors that contributed to the development and maintenance of expert performance in 10 elite athletes. Each of the participating athletes had won at least two gold medals at separate Olympics and/or World Championships. Through in-depth, open-ended qualitative interviews, it was found that the athletes progressed through the following four stages during their career (Durand-Bush & Salmela, 2002, p. 158):

1. Sampling years – characterized by engaging in sport or physical activity for pleasure and social aspects.

2. Specialization years – characterized by athletes investing time and effort into preferred sports. Training and structure became important.
3. Investment years – characterized by athletes focusing on the specific sport in which they won medals.
4. Maintenance years – characterized by athletes being at the pinnacle of their sport. Continued training and competition is important to maintain and improve.

During the maintenance stage, the results showed that personal attributes such as self-confidence, motivation, and mental toughness, significantly contributed to their success. These findings confirm that unique personal characteristics significantly contribute to the development of expertise in sport (Durand-Bush & Salmela, 2002; Gould et al., 1992).

### *Coping Strategies*

Coping is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). Many of the efforts used to overcome the demands of sport performance have been called coping strategies (Gould et al., 1993a). Coping strategies is also a term that is used synonymously with terms such as performance strategies, competition strategies, or practice strategies (Gould et al., 2002). The mental skills that are often associated with these strategies are skills such as self-talk, imagery, relaxation, emotional control, goal-setting, attentional control and mental toughness. When looking back at the characteristics of mental toughness suggested by Jones et al. (2002) and Stratton (2004), many appear to be coping strategies as identified by Gould, Eklund et al. (1993a) and Gould, Dieffenbach et al. (2002). Therefore, it seems that it will continue to be difficult to separate coping strategies from mental toughness until we have a clear understanding of mental toughness. Many athletes use these mental skills as a competitive advantage in order to overcome adversity or to cope with stress. In an effort to identify the coping strategies used by champion athletes, Gould, Finch, and Jackson (1993b) conducted a study to examine these strategies in seventeen U.S. National Champion figure skaters. Using qualitative interviews to collect data, the researchers were able to obtain in-depth information regarding the stress-coping strategies used by these athletes and how they were linked to specific stress sources (Gould et al., 1993b). The researchers in this study described coping as a process that encompasses purposeful

responses to a stressor. Following the in-depth interviews, 158 coping skills were identified, which were then organized into 13 general dimensions of coping strategies which are as follows (Gould et al., 1993b, p. 458-460):

1. Rational thinking and self-talk.
2. Positive focus and orientation.
3. Social support.
4. Time management.
5. Pre-competitive mental preparation and anxiety management.
6. Training hard and smart.
7. Isolation and deflection.
8. Ignoring sources of stress.
9. Uncategorized strategies that fell under no other dimension.
10. Reactive behaviors to stress.
11. No coping strategies used for dealing with stress.
12. Striving for a positive working relationship with partner.
13. Changing to healthy eating attitudes and behaviors.

The results of this study show that for champion athletes, coping is a process that links the stressors they face to an individual coping strategy. The researchers concluded that future research is now needed to identify the most effective coping strategies for peak performance (Gould et al., 1993b).

Many athletes employ a variety of coping strategies when faced with adversity. In 1993, Gould et al. (1993a) attempted to identify the coping strategies used by 20 members of the 1988 Olympic Wrestling Team. Through in-depth qualitative interviews it was revealed that all members used a variety of coping methods such as (p. 83):

- Thought control strategies – such as blocking distractions, perspective taking, positive thinking, coping thoughts, and prayer
- Task force strategies – such as narrow, more immediate focus, concentrating on goals
- Behavioral based strategies – such as changing or controlling the environment, following a set routine
- Emotional control strategies – such as arousal control, visualization.

As these studies show, there is a need for clarity regarding mental toughness and coping strategies. The coping strategies identified in these studies are closely related to the characteristics of mental toughness as identified by Jones et al. (2002) and Stratton (2004). Many of the strategies used by elite athletes to respond to stress seem to be both a characteristic of and an application of mental toughness. Without a clear understanding of mental toughness, it is difficult to separate the constructs. For these reasons, the literature on this topic should be expanded in order to develop a comprehensive understanding of the relationship of coping strategies and mental toughness.

### *Theoretical Foundation*

The theoretical foundation for this study is based on personal construct theory. Personal construct theory draws from a constructivist perspective that emphasizes the individual's interpretation of meaning (Kelly, 1955). The emphasis on the human experience is important since this study is interested in the lived experiences of individual coaches and how they interpret mental toughness. The personal construct theory suggests that we use our constructs to represent the truth as we understand it (Kelly, 1955). The fundamental postulate of personal construct theory states that "a person's processes are psychologically channelised by the ways in which they anticipate events" (Bannister & Fransella, 1986, p. 6). The formal content of this theory is based on eleven corollaries that combine with the fundamental postulate to form the personal construct theory. The eleven corollaries are as follows (Kelly):

- Construction Corollary – A person anticipates events by construing their replications.
- Individuality Corollary – Persons differ from each other in their constructions of events.
- Organization Corollary – Each person characteristically evolves for their convenience in anticipating events, a construction system embracing ordinal relationships between constructs.
- Dichotomy Corollary – A person's construct system is composed of a finite number of dichotomous constructs.
- Choice Corollary – Persons choose for themselves that alternative in a dichotomized construct through which they anticipate the greater possibility for the elaboration of their system.

- Range Corollary – A construct is convenient for the anticipation of a finite range of events only.
- Experience Corollary – A person’s construction system varies as they successively construe the replication of events.
- Modulation Corollary - The variation in a person’s construction system is limited by the permeability of the constructs within whose ranges of convenience that variants lie.
- Fragmentation Corollary – A person may successively employ a variety of construction subsystems which are inferentially incompatible with each other.
- Commonality Corollary – To the extent that one person employs a construction of experience which is similar to that employed by another, their processes are psychologically similar to those of the other person.
- Sociality Corollary – To the extent that one person construes the construction processes of another, they may play a role in the social process involving the other person.

The fundamental postulate includes several implications. “It implies that you are not reacting to the past so much as reaching out for the future; it implies that you check how much sense you have made of the world by seeing how well that sense enables you to anticipate it; it implies that your personality is the way you go about making sense of the world” (Bannister & Francell, 1986, p. 8).

Personal construct theory is different from most other psychological theories because it is based on the behavior of people who use the theory. It centers itself on the human experience (Bannister & Francell, 1986). It is “fundamentally a theory of human action” (Bannister, 1970, p. 91). To be consistent with construct theory, each coach will be asked questions about human behavior based on their personal experiences and relationships (Kelly, 1955). By using this theory as a guide, each coach will have the opportunity to describe mental toughness in their own words, based on their view of the construct.

## Summary

There is clearly a significant gap in the literature regarding mental toughness. This may be a direct result of the confusion regarding the constructs surrounding mental toughness. The available research shows that mental toughness is one of the most important attributes for performance success (Jones et al., 2002). Unfortunately, due to the lack of literature, most are not aware of what mental toughness is or how to develop it. In order for this topic to be developed, it must first be understood. In an effort to provide some understanding, Jones et al. defined and identified characteristics of mental toughness. Stratton (2004), although not empirically, provided additional insight into the characteristics of mental toughness based on the perceptions, experiences, and professional accomplishments of Cal Ripken.

Gould et al. (2002), Golby and Sheard (2003), and Durand-Bush and Salmela (2002), all found a link between the possession of unique psychological characteristics and performance success in elite athletes. These studies were also able to identify mental toughness as one of the most significant contributing psychological skills to performance success. Gould, Finch et al. (1993b) and Gould, Eklund et al. (1993a), both found that elite athletes employ a variety of coping strategies when faced with adversity and identified the coping strategies used by these athletes. These studies are helpful as they expand the knowledge of the unique strategies used by athletes for peak performance.

The limited amount of literature on mental toughness clearly shows the need for expansion. If mental toughness is going to be developed, the components must first be identified. Jones et al. (2002) began the process, but more is required to develop a construct as important and complex as mental toughness.

## CHAPTER 3

### METHODOLOGY

This chapter will discuss the participants, instrumentation, procedures and data analysis used in the study. This study utilized both qualitative and quantitative research methods to analyze the essential components of mental toughness as perceived by twenty-two NCAA coaches.

#### *Participants*

The study group for this research is comprised of twenty-two NCAA coaches from a mix of Division I, II, and III male sports teams. A mix of different NCAA divisions was chosen to increase the diversity of the sample group. Each participant had a minimum of ten years of experience as a head or assistant coach at the college level in their specific sport. Consistent with qualitative methodologies, purposeful sampling was used to select study participants. Purposeful sampling was used to ensure that each participant had sufficient experience to respond in a knowledgeable way.

#### *Instrumentation*

The instrument used in phase one of this study was a questionnaire (see Appendix A) comprised of twenty components of mental toughness. The twenty components consisted of a randomized combination of the 12 attributes of mental toughness that emerged from Jones et al. (2002) and the eight characteristics of perseverance as identified by Cal Ripken, are as follows (Stratton, 2004):

1. Having an unshakable self-belief that you possess unique qualities and abilities that make you better than your opponents.
2. Strength: you have to be in good physical and mental condition. You must be psychologically and emotionally prepared.
3. Having an unshakable self-belief in your ability to achieve your competition goals.
4. Have conviction: you have to be a little bit stubborn.
5. Regaining psychological control following unexpected, uncontrollable events (competition specific).

6. Have a strong will to succeed: don't let setbacks stop you from achieving your goal.
7. Remaining fully focused on the task at hand in the face of competition-specific distractions.
8. Be consistent: recognize and adjust to change so that you are always able to make a contribution to your team.
9. Not being adversely affected by others' good and bad performances.
10. Be competitive: its not just about beating your opponent. You have to internalize competitiveness and take pride in what you do.
11. Switching a sport focus on and off as required.
12. Personal management: don't duck potential problems; take on the problems directly to prevent small problems from building into bigger problems.
13. Thriving on the pressure of competition.
14. Take the right approach: always be ready to play.
15. Accepting that competition anxiety is inevitable and knowing that you can cope with it.
16. Have passion for what you do: love what you do.
17. Having an insatiable desire and internalized motives to succeed.
18. Bouncing back from performance set-backs as a result of increased determination to succeed.
19. Remaining fully-focused in the face of personal life distractions.
20. Pushing back the boundaries of physical and emotional pain, while still maintaining technique and effort under distress (in training and competition).

Each component was assessed by the participants based on their perceptions of (a) the importance of including each component in the construct of mental toughness and (b) the degree to which each component is teachable (trainable). The participants assessed both the importance and the degree to which the component was teachable (trainable), using a 5-point Likert scale. In order to provide an opportunity for further insight or expansion of the twenty components, two additional questions followed: (a) are there other components of mental toughness that should be included that are not listed above? and (b) do you believe that any of the above components should be combined to form an individual, essential component of mental toughness?

Consistent with qualitative methodologies of Gould et al. (1993a) and personal construct theory (Kelly, 1955), phase two consisted of follow-up interviews with ten randomly selected participants of phase one. These semi-structured interviews were based on the analysis of the questionnaires and provided in-depth, detailed information of the construct of mental toughness based on the lived experience of the participants. The questions that guided these interviews are as follows:

- Since the questionnaire was administered, can you identify and describe any other components of mental toughness that you have experienced?
- Do you feel that the components that resulted from this study capture the essence of mental toughness?
- Based on the components of mental toughness that emerged from this study, do you feel that programs can now be designed to develop this mental skill?
- Do you feel that it is important for your athletes to be mentally tough?
- Do you believe the characteristics of mental toughness can be developed before they get to your program?
- Do you feel that you recruit athletes who show characteristics of mental toughness?
- Do you attempt to develop the characteristics of mental toughness with your team? If so, with the team as a whole or with individuals?
- Why do you feel that coaches, in general, do not spend a lot of time on developing the characteristics of mental toughness?
- Do you think a program designed to develop the characteristics of mental toughness would be useful to your program?
- Do you think other coaches would use it?

### *Procedure*

The procedures for this study were divided into two phases. Phase one consisted of each participant completing a questionnaire (see Appendix A) based on the random combination of the 12 attributes of mental toughness of Jones et al. (2002) and the eight characteristics of perseverance identified by Cal Ripken (Stratton, 2004). The questionnaire also provided an opportunity for the participants to add to the characteristics or attributes presented, and to provide feedback as to whether they perceived the characteristics to be teachable (trainable).

Each coach was contacted and asked to participate in this study and told that the questionnaire should take approximately 10 minutes to complete. Phase One questionnaire was administered in early fall semester, 2005.

Phase Two of this study consisted of a follow-up, by completing semi-structured interviews with ten randomly selected participants of Phase One. The interviews were based on the analysis of the questionnaires and provided an opportunity to gain further insight into their perspectives on mental toughness. Phase Two was administered during the middle of fall semester, 2005.

### *Data Analysis*

The data analysis procedures began by evaluating each of the 20 characteristics of the Phase One questionnaire in order to establish a mean value. Two mean values were calculated for each characteristic. The first value indicated the importance of including each characteristic in mental toughness and the second value indicated to what degree the participants perceived the characteristic to be teachable (trainable). If the mean value for the importance of the individual characteristic fell below a score of 3, the characteristic was considered for elimination as a possible component of mental toughness. If the mean value for the perception of teachability (trainability) fell below a score of 3 then the characteristic was considered to be essentially non-teachable. Next, the characteristics were rank-ordered based on their mean score of importance to mental toughness. All responses to questions 21 and 22 of the Phase One questionnaire were evaluated for further meaningful insight into the characteristics. Finally, all responses to the Phase Two interviews were analyzed for possible expansion or clarification of the characteristics.

### *Pilot Study*

A pilot test of the questionnaire (see Appendix A) used in Phase One of this study was performed in order to provide feedback in regard to the readability and suitability of the instrument as well as the time required to complete it. The test was conducted using four qualified coaches that will not be participating in the study. After completing the questionnaire, each participant was asked the following questions:

- Did you fully understand the purpose of the questionnaire?
- Did you fully understand the instructions that were provided?

- Approximately, how much time was required to complete the questionnaire?

Each participant responded that they fully understood both the purpose and the instructions. All four participants also responded that the questionnaire took approximately 10 minutes to complete. However, none of the participants responded to the two additional questions at the end of the questionnaire. Those questions were designed to provide an opportunity for clarification or expansion of the characteristics listed on the questionnaire. The lack of responses to these questions provides further justification for the follow-up interviews of Phase Two of this study. The face-to-face interviews of Phase Two also provided another opportunity for clarification or expansion of the results of the questionnaire.

Based on the positive outcome of the pilot study, Phase One of this study was able to provide information that was the basis of this research project. This pilot test was important because it provided a clearer picture of the participants' reactions to the instrument.

## CHAPTER 4

### RESULTS

The purpose of this study was to identify the components of mental toughness as perceived by NCAA coaches. In an effort to further investigate the construct of mental toughness, two research questions were developed:

1. What are the essential components of mental toughness as perceived by NCAA coaches?
2. To what degree do NCAA coaches perceive the components of mental toughness to be teachable (trainable)?

#### *Phase One Results*

Twenty-two NCAA coaches from a mix of Division I, II, and III male sports teams comprised the study group. The sports represented by the participants were football, soccer, basketball, track and field, lacrosse, baseball, wrestling, swimming, and rowing. These coaches had an average of twenty-three years of experience as a head or assistant coach at the college level.

Each of the participants evaluated the 20 characteristics of the Phase One questionnaire (see Appendix A) based on their perceptions of (a) the importance of including each component in the construct of mental toughness and (b) the degree to which each component is teachable (trainable). The results below show the rank-order of the characteristics based on their mean score of importance to mental toughness. The mean values that resulted from the rating of importance to mental toughness have a spread of 1.0 (3.9-4.9) and hence created several ties within the data. These mean value ties are indicated in the rank-ordering below.

#### *Rank-Order of Components*

1. Have a strong will to succeed: don't let setbacks stop you from achieving your goal. (M= 4.9, SD =.29) (Trainability M=3.6)
2. Remaining fully focused on the task at hand in the face of competition-specific distractions. (M=4.8, SD=.43) (Trainability M=3.8)

- Have passion for what you do: love what you do. (M=4.8, SD=.50) (Trainability M=3.0)
3. Strength: you have to be in good physical and mental condition. You must be psychologically and emotionally prepared. (M=4.7, SD=.46) (Trainability M=4.4)  
 Regaining psychological control following unexpected, uncontrollable events (competition specific). (M=4.7, SD=.57) (Trainability M=3.6)  
 Be competitive: its not just about beating your opponent. You have to internalize competitiveness and take pride in what you do. (M=4.7, SD=.57) (Trainability M=3.7)  
 Thriving on the pressure of competition. (M=4.7, SD.48) (Trainability M=3.0)
  4. Having an insatiable desire and internalized motives to succeed. (M=4.6, SD=.50) (Trainability M=2.8)  
 Bouncing back from performance set-backs as a result of increased determination to succeed. (M=4.6, SD.58) (Trainability M=3.3)  
 Pushing back the boundaries of physical and emotional pain, while still maintaining technique and effort under distress (in training and competition). (M=4.6, SD=.58) (Trainability M=3.4)
  5. Having an unshakable self-belief that you possess unique qualities and abilities that make you better than your opponents. (M=4.5, SD=.67) (Trainability M=3.7)  
 Having an unshakable self-belief in your ability to achieve your competition goals. (M=4.5, SD=.51) (Trainability M=3.5)  
 Personal management: don't duck potential problems; take on the problems directly to prevent small problems from building into bigger problems. (M=4.5, SD=.60) (Trainability M=4.0)  
 Take the right approach: always be ready to play. (M=4.5, SD=.67) (Trainability M=3.9)
  6. Be consistent: recognize and adjust to change so that you are always able to make a contribution to your team. (M=4.4, SD=.66) (Trainability M=4.1)  
 Not being adversely affected by others' good and bad performances. (M=4.4, SD=.66) (Trainability M=3.7)

7. Accepting that competition anxiety is inevitable and knowing that you can cope with it. (M=4.3, SD=.72) (Trainability M=3.7)  
Remaining fully-focused in the face of personal life distractions. (M=4.3, SD=.72) (Trainability M=2.9)
8. Have conviction: you have to be a little bit stubborn. (M=4.1,SD=.81) (Trainability M=2.8)
9. Switching a sport focus on and off as required. (M=3.9, SD=1.08) (Trainability M=3.2)

### *Teachability/Trainability*

The second research question was, to what degree do NCAA coaches perceive the characteristics of mental toughness to be teachable (trainable)? In an effort to answer this question, each of the 20 characteristics was evaluated by the participants based on their perception of the teachability (trainability) of the characteristic. If the mean value for any characteristic fell below a score of 3 then the characteristic was considered to be essentially non-teachable. The results show that only three (questions 4, 17, 19) of the characteristics failed to meet the minimum mean value score of 3 and are therefore considered to be non-trainable. All 20 Teachability (Trainability) mean values are shown in Appendix B and Appendix C, in their original Phase One questionnaire order.

In order to provide an opportunity for further insight or expansion of the twenty components, two additional questions followed: (question 21) are there other components of mental toughness that should be included that are not listed above? and (question 22) do you believe that any of the above components should be combined to form an individual, essential component of mental toughness? Eight of twenty-two (36%) participants responded to the first qualitative question (question 21) of the questionnaire. All eight responses to question 21 were evaluated; however, they did not provide a discernible theme. The responses that were provided are listed below:

1. Sense of urgency without panic.
2. Wanting the responsibility when the game is on the line.
3. No, I think the components in this questionnaire are very comprehensive!
4. Ability to respond positively to criticism.

5. Establish the will to work to win.
6. Self-motivated
7. Having a never quit attitude.
8. Having a killer instinct.

Five of twenty-two participants responded to the second qualitative question of the phase one questionnaire (question 22), do you believe that any of the above components should be combined to form an individual component of mental toughness? Four participants responded that no components should be combined to form an individual component and one participant responded that having conviction (question 4) and having a strong will to succeed (Question 6) should be combined to form an individual component of mental toughness.

### *Phase Two Qualitative Interviews*

Phase Two of this study consisted of follow-up, semi-structured interviews with ten randomly selected participants of Phase One. These interviews provided an opportunity to gain further insight into the participants' perspectives on mental toughness. All responses were analyzed for possible expansion or clarification of the Phase One results. The anonymity and confidentiality of the study participants are protected through the use of pseudonyms.

*Question 1:* Since the questionnaire was administered, can you identify and describe any other components of mental toughness that you have experienced that were not covered on the questionnaire?

All ten interview participants indicated that the components covered in the questionnaire were comprehensive and that no further additions needed to be made. Eight of ten participants also mentioned that they had a particular component or characteristic of mental toughness in mind before responding, but found that it was identified within the questionnaire.

*Question 2:* Do you feel that the components that resulted from this study capture the essence of mental toughness?

Each of the respondents agreed that each component identified in this study should be associated with mental toughness. However, six of ten mentioned that the trainability of the characteristics was a much larger issue. Coach (X) stated, "I agree with all of these components, but you just can't teach some of them, either they have it or they don't."

*Question 3:* Based on the components of mental toughness that emerged from this study, do you feel that programs can now be more easily designed to develop this mental skill?

The participants all agreed that identifying the components was a first step in developing mental toughness. One participant, Coach (Y) stated, “This is a good start, I can now share the characteristics I am looking for with my players.” Another participant added “This helps because I can’t develop something I don’t understand.”

*Question 4:* Do you feel that it is important for your athletes to be mentally tough?

Ten of ten respondents agreed that mental toughness is important for their athletes to possess. Eight of ten mentioned that the overall performance of their athletes is directly related to their level of mental toughness. Coach (B) stated that “the kids who can consistently perform after a mistake, no matter the environment, will always be my best athletes.” The same eight respondents also mentioned that mental toughness was the most important mental skill for athletic performance.

*Question 5:* Do you believe the characteristics of mental toughness can be developed before they get to your program?

All participants responded that mental toughness can be developed in athletes before they enter their respective program. However, there were many differences in responses as to how the athletes acquired mental toughness prior to their college experience. The responses indicated that aspects of mental toughness are developed in 50 to 75% of athletes prior to college. When asked how they thought the athletes with aspects of mental toughness acquired mental toughness, the following responses were given:

1. parents/genetics
2. strong profound figure in the life of the athlete
3. strong role-models or family members
4. high school coach
5. positive environment
6. learned from past experiences
7. past success in tough situations
8. playing in multiple big games

*Question 6:* Do you feel that you recruit athletes who show characteristics of mental toughness?

All ten participants responded that they made an effort to recruit athletes who had demonstrated some components of mental toughness. However, they also agreed that it was very difficult to determine if an athlete is mentally tough. One reason for this difficulty was expressed by coach (Z) when he stated “we have a very limited amount of time to spend with the athletes during the recruiting process, and we spend most of that time selling our program.” A second reason given for the difficulty in determining mental toughness was due to the need to rely on second-hand information during the recruiting process. Coach (A) mentioned that many times he has to rely on the information given by high school coaches, scouting services, and teachers in order to make a recruiting decision. Five of the ten respondents mentioned that, in their effort to determine mental toughness, they observe how the athletes respond to competition and performance mistakes before making a decision.

*Question 7:* Do you attempt to develop the characteristics of mental toughness with your team? If so, with the team as a whole or do you work with individuals?

Only one of the ten participants mentioned that he made a deliberate attempt to develop the characteristics of mental toughness with his team or with individuals on the team. Nine of ten participants reported that they may pull an individual player aside during practice and mention a particular component of mental toughness, but did not attempt to develop it. One participant stated “after a performance mistake, I will call the player over and tell him to focus or to get some confidence!”

*Question 8:* Why do you feel that coaches, in general, do not spend a lot of time on developing the characteristics of mental toughness?

All participants mentioned the same two reasons for not spending time on the development of mental toughness. The first reason given was a lack of knowledge of how to develop mental toughness and the second was a lack of time to develop it. Coach (B) stated that “I know my players need it (mental toughness) but I don’t really know how to train it and simply don’t have the practice time to figure it out.”

*Question 9:* Do you think a program designed to develop the characteristics of mental toughness would be useful to your program?

All participants felt that a mental toughness program would be beneficial, but they were concerned about the time it would take away from practice. One participant stated “I would love

it, but it would have to be short and to the point because I only have 20 hours with my athletes a week.” Another participant stated “It would be great if it could be targeted to individual athletes and the characteristics they are lacking.” The participants all viewed mental toughness as an important aspect of their sport and were interested in implementing some type of mental toughness training in their program.

*Question 10:* Do you think other coaches would use it?

The participants agreed that the majority of coaches would use a program to develop mental toughness as long as it was not time-prohibitive. Coach (Z) stated “my job is about winning, and every coach I know is interested in developing ways to win more games.” Another participant stated “I would dedicate my team’s time to develop two or three of the most important characteristics, because it seems that every team is physically competitive, so I need a mental edge on them.”

## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

#### Discussion of Research Findings

##### *Importance*

The results of this study show the rank-order of the components based on their mean score of importance to mental toughness. The general perception of the coaches was that all 20 of the components included in the Phase One questionnaire possessed a relatively high degree of importance to mental toughness. No single component was rated with a mean score below 3 and the average mean score based on importance to mental toughness was 4.5. Also the mean values that resulted have a variance of only 1.0 and hence created several ties with the rank-ordered data. The consistency by which the coaches ranked the components of this study seems to indicate that the components are essential components of mental toughness. One apparent reason for the consistency of the importance results may be due to the sources from which the components were gathered. The 20 components were drawn from two sources that had condensed a much broader list of potential components. Twelve of the components were drawn from a very well designed study in 2002 by Jones et al. and eight were a result of components identified by Cal Ripken in 2004. Although one source is empirical (Jones et al., 2002) and one non-empirical (Stratton, 2004), the results do not show a difference in perceived value of individual components based on their source. This lack of variance maybe based on the similarities in populations. Both sources relied upon the perceptions and experiences of elite athletes. The findings of this study seem to provide further validity to the components that emerged from Jones et al. (2002) and Stratton (2004).

The purpose of this study was to identify the components of mental toughness. The findings of Phase Two of this study revealed data that supports this purpose. During the Phase Two interviews 100% of the participants responded that the components of this study were comprehensive and that no further additions needed to be made. One-hundred percent of the participants also responded that each of the components identified in this study captured the essence of and should be associated with mental toughness. These findings indicate that coaches perceive these components to be essential and important to mental toughness.

## *Teachability*

This study attempted to identify the degree of teachability/trainability of each of the components of mental toughness. This was the first time this issue had been explored and it represents the next logical step for developers of mental toughness training programs. The results show that only 3 of 20 components failed to meet the minimum mean value score of 3.0 and were determined to be essentially non-teachable. Of these three, the average of their mean values was 2.8, which would indicate that they were not dramatically below the cut-off point. These values simply suggest that coaches or program developers can evaluate the relative values in terms of trainability and use that information to make priority training decisions.

The need for priority training decisions was indicated in several areas during the Phase Two interviews. When asked about their reasons for not developing mental toughness in their athletes, 100% of the participants responded that it was due to a lack of knowledge and time. All participants were concerned about the time that mental toughness training would take away from practice. In an effort to emphasize the need for training priorities, one participant stated that “I would dedicate my team’s time to develop two or three of the most important characteristics...” The results of these interviews revealed that coaches are very interested in mental toughness training programs as long as they are not time-prohibitive. The coaches also indicated that NCAA time restrictions would not allow for the training of all the important components of mental toughness. Therefore, the quantitative results provide additional information on the teachability or trainability of the components that can help coaches or developers select the components that best fit their time and performance needs. These results also support those of Bull et al. (2005), which indicate that coaches may need a more integrated coaching team to assist in the selection and implementation of the most effective training program.

## **Conclusions**

It is apparent from the findings that the coaches feel that all the components included in this study are relatively important to mental toughness. Based on their mean values, all 20 components of this study were found to be important to mental toughness. In addition, 100% of the participants indicated that the components identified in this study were comprehensive and captured the essence of mental toughness.

The findings also indicate that some of the components were not likely to be trainable. Trainability was found to be an issue that needed to be explored, because although an individual component may be important, it may not necessarily be trainable. The concept of trainability became more critical, according to the coaches, as a result of the time restrictions imposed on them by the NCAA. (a) These time restrictions make it unlikely for coaches or program developers to be able to implement a comprehensive mental toughness program. By having the capability to evaluate both the importance and the relative teachability of individual components, coaches can select the most appropriate training components.

One-hundred percent of the study participants mentioned that mental toughness was important for their athletes to possess. Eighty percent mentioned that the overall performance of their athletes is directly related to their level of mental toughness. The same respondents also indicated that mental toughness was (b) the most important mental skill for athletic performance. However, only 10% responded that they made a deliberate attempt to develop mental toughness with their team or individuals on their team. These findings are in line with those of Gould et al. (1987) in which 82% of coaches found mental toughness to be the most important psychological attribute for wrestling success but only 9% of those coaches had success in developing mental toughness. These findings are important because they indicate a need for the development of this mental skill. Coaches recognize the importance but seem to lack the knowledge and time to develop this mental skill.

### **Implications**

The findings of this study provide coaches and program developers the capability to evaluate both the importance and relative teachability of the components of mental toughness. This evaluation is critical as they select the most appropriate training components with a relative lack of knowledge of the concept and the pressure of time restrictions. The findings also indicate that the importance of the component does not necessarily correlate with the teachability of the component. The identification of this relationship may be the most meaningful contribution of this study. The findings of this study further suggest that coaches and program developers lack the ability to implement a comprehensive training program. Based on the need for a more direct approach, the results of this study provide information for the selection of the most important and teachable components of mental toughness, should they choose to use it.

Furthermore, this study may help clarify the complex construct of mental toughness. Through the identification of the essential components, their perceived importance and teachability, a better understanding of this concept may result. This may be beneficial for those hoping to define and develop this mental skill. Finally, these findings add to the literature concerning this topic and extend the work of Jones et al. (2002), and Stratton (2004).

### **Recommendations for Future Research**

Based on the findings of this investigation, several lines of additional research seem warranted. First, it would be useful to investigate how mental toughness is developed in athletes. All study participants mentioned that mental toughness could be developed in athletes before they entered their respective programs. However, they could not come to an agreement on how the athletes were able to develop it. Second, further research should be conducted to determine if there are differences in the perceptions of mental toughness based on gender. There has long been a perception that males and females approach coaching from different philosophical areas. This line of research would help clarify these perceptions regarding mental toughness. A third line of research that should receive further investigation is whether the perceptions of mental toughness differ in coaches of Division I revenue sports and Division I non-revenue sports. The population for this study was not targeted to draw conclusions based on this criterion.

Based on the advantages that mental toughness can offer to the performer, further research is warranted to fill the gap in the literature and to develop a comprehensive understanding of this very complex topic.

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**APPENDIX A – PHASE ONE QUESTIONNAIRE**

**Mental Toughness Questionnaire**

**Please fill out the information below before completing the following  
questionnaire.**

**Name:** \_\_\_\_\_

**This information is needed for a possible follow-up interview; your name will never be associated with the information you provide in the following questionnaire.**

**Sport Coached:** \_\_\_\_\_

**Years of college coaching experience:** \_\_\_\_\_yrs.

## Mental Toughness Questionnaire

### Directions:

Please rate each characteristic in two ways. First, rate the importance of including each characteristic as being essential to mental toughness by circling the number that indicates your feelings on the 5-point scale. Next, indicate to what degree you perceive each characteristic to be teachable (trainable) using the 5-point scale. Take your time and give thoughtful consideration to each response. Questions 21 and 22 will ask for additional analysis based on the characteristics provided. Please do not omit any items.

Unimportant	Of Little Importance	Moderately Important	Important	Very Important
1	2	3	4	5
Not at all Teachable	Hardly Teachable	Somewhat Teachable	Teachable	Very Teachable
1	2	3	4	5

---

- Having an unshakable self-belief that you possess unique qualities and abilities that make you better than your opponents.

1    2    3    4    5

1    2    3    4    5

- Strength: you have to be in good physical and mental condition. You must be psychologically and emotionally prepared.

1    2    3    4    5

1    2    3    4    5

- Having an unshakable self-belief in your ability to achieve your competition goals.

1    2    3    4    5

1    2    3    4    5

	Of Little	Moderately		Very	
Unimportant	Importance	Important	Important	Important	Important
1	2	3	4	5	
Not at all	Hardly	Somewhat		Very	
Teachable	Teachable	Teachable	Teachable	Teachable	Teachable
1	2	3	4	5	

- Have conviction: you have to be a little bit stubborn.

1 2 3 4 5  
1 2 3 4 5

- Regaining psychological control following unexpected, uncontrollable events (competition specific).

1 2 3 4 5  
1 2 3 4 5

- Have a strong will to succeed: don't let setbacks stop you from achieving your goal.

1 2 3 4 5  
1 2 3 4 5

- Remaining fully focused on the task at hand in the face of competition-specific distractions.

1 2 3 4 5  
1 2 3 4 5

- Be consistent: recognize and adjust to change so that you are always able to make a contribution to your team.

1 2 3 4 5  
1 2 3 4 5

Unimportant	Of Little	Moderately	Important	Very
1	Importance	Important	4	Important
	2	3		5
Not at all	Hardly	Somewhat	Teachable	Very
Teachable	Teachable	Teachable	Teachable	Teachable
1	2	3	4	5

- Not being adversely affected by others' good and bad performances.

1 2 3 4 5  
1 2 3 4 5

- Be competitive: its not just about beating your opponent. You have to internalize competitiveness and take pride in what you do.

1 2 3 4 5  
1 2 3 4 5

- Switching a sport focus on and off as required.

1 2 3 4 5  
1 2 3 4 5

- Personal management: don't duck potential problems; take on the problems directly to prevent small problems from building into bigger problems.

1 2 3 4 5  
1 2 3 4 5

- Thriving on the pressure of competition.

1 2 3 4 5  
1 2 3 4 5

Unimportant 1	Of Little Importance 2	Moderately Important 3	Important 4	Very Important 5
Not at all Teachable 1	Hardly Teachable 2	Somewhat Teachable 3	Teachable 4	Very Teachable 5

- Take the right approach: always be ready to play.

1    2    3    4    5  
1    2    3    4    5

- Accepting that competition anxiety is inevitable and knowing that you can cope with it.

1    2    3    4    5  
1    2    3    4    5

- Have passion for what you do: love what you do.

1    2    3    4    5  
1    2    3    4    5

- Having an insatiable desire and internalized motives to succeed.

1    2    3    4    5  
1    2    3    4    5

- Bouncing back from performance set-backs as a result of increased determination to succeed.

1    2    3    4    5  
1    2    3    4    5

Unimportant	Of Little	Moderately	Important	Very
1	Importance	Important	4	Important
	2	3		5

Not at all	Hardly	Somewhat	Teachable	Very
Teachable	Teachable	Teachable	Teachable	Teachable
1	2	3	4	5

- Remaining fully-focused in the face of personal life distractions.

1	2	3	4	5
1	2	3	4	5

- Pushing back the boundaries of physical and emotional pain, while still maintaining technique and effort under distress (in training and competition).

1	2	3	4	5
1	2	3	4	5

- Are there other components of mental toughness that should be included that are not listed above? If so, list them and rate each using the two scales you have used for rating the previous 20 items.

- Do you believe that any of the above components should be combined to form an individual component of mental toughness?

## **APPENDIX B – PHASE ONE QUESTIONNAIRE TEACHABILITY (TRAINABILITY)**

### **MEAN VALUES**

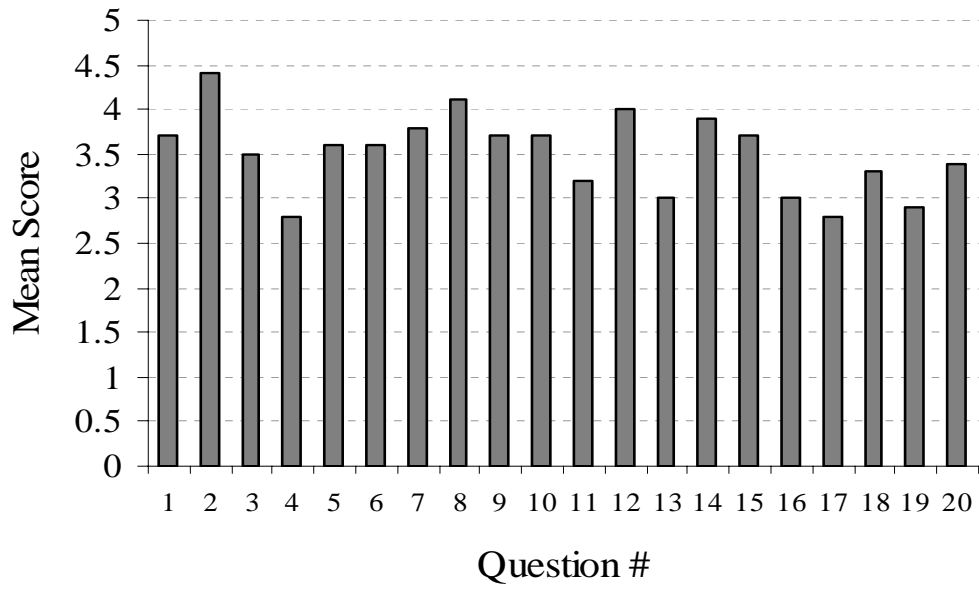
The following characteristics are shown in original Phase One (see Appendix A) order.

1. Having an unshakable self-belief that you possess unique qualities and abilities that make you better than your opponents. (M=3.7)
2. Strength: you have to be in good physical and mental condition. You must be psychologically and emotionally prepared. (M=4.4)
3. Having an unshakable self-belief in your ability to achieve your competition goals. (M=3.5)
4. Have conviction: you have to be a little bit stubborn. (M=2.8)
5. Regaining psychological control following unexpected, uncontrollable events (competition specific). (M=3.6)
6. Have a strong will to succeed: don't let setbacks stop you from achieving your goal. (M=3.6)
7. Remaining fully focused on the task at hand in the face of competition-specific distractions. (M=3.8)
8. Be consistent: recognize and adjust to change so that you are always able to make a contribution to your team. (M=4.1)
9. Not being adversely affected by others' good and bad performances. (M=3.7)
10. Be competitive: its not just about beating your opponent. You have to internalize competitiveness and take pride in what you do. (M=3.7)
11. Switching a sport focus on and off as required. (M=3.2)
12. Personal management: don't duck potential problems; take on the problems directly to prevent small problems from building into bigger problems. (M=4.0)
13. Thriving on the pressure of competition. (M=3.0)
14. Take the right approach: always be ready to play.(M=3.9)

15. Accepting that competition anxiety is inevitable and knowing that you can cope with it. (M=3.7)
16. Have passion for what you do: love what you do. (M=3.0)
17. Having an insatiable desire and internalized motives to succeed. (M=2.8)
18. Bouncing back from performance set-backs as a result of increased determination to succeed. (M=3.3)
19. Remaining fully-focused in the face of personal life distractions.(M=2.9)
20. Pushing back the boundaries of physical and emotional pain, while still maintaining technique and effort under distress (in training and competition). (M=3.4)

## APPENDIX C – TEACHABILITY MEAN VALUES

Teachability Mean Values



## APPENDIX D – IRB APPROVAL

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### Institutional Review Board

Dr. David M. Moore  
IRB (Human Subjects) Chair  
Assistant Vice President for Research Compliance  
CVM Phase II- Duckpond Dr., Blacksburg, VA 24061-0442  
Office: 540/231-4991; FAX: 540/231-6033  
email: moored@vt.edu

DATE: July 13, 2005

### MEMORANDUM

TO: Richard K. Stratton Teaching and Learning 0313  
John Creasy Curriculum and Instruction

FROM: David Moore 

SUBJECT: **IRB Exempt Approval:** "Analysis of the Components of Mental Toughness in Sport" IRB # 05-429

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of July 13, 2005.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/20/07) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File  
Department Reviewer: Jan K. Nespor

## **CURRICULUM VITAE**

**John Wayne Creasy Jr.**

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### **EXPERIENCE**

#### **Visiting Professor**

Roanoke College (2005 to Present)

#### **Pharmaceutical Sales Representative**

Medpointe Pharmaceuticals Inc. (2004-2005)

#### **Territory Business Manager**

Bristol-Myers Squibb Company (2003-2004)

#### **United States Secret Service (2002)**

#### **Director of NC Operations**

Blair Construction Inc. (2001-2002)

#### **Director of Operations**

Marshall Concrete Products Inc. (1993-2001)

### **EDUCATION**

#### **Doctor of Philosophy, Curriculum and Instruction**

Virginia Polytechnic Institute and State University, 2005

#### **Master of Science, Education**

Virginia Polytechnic Institute and State University, 2002

#### **Bachelor of Science, Education**

Virginia Polytechnic Institute and State University, 1992

### **BIRTHDATE**

November 10, 1968