

Mental Toughness among College Athletes.

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Introduction:

According to sporting culture, mental toughness is a key component of athletic performance and success. Announcers and coaches describe athletic teams as mentally tough consistently in the media, especially after a difficult game or match. Athletes attribute their success to mental toughness as well. Vince Lombardi, one of the greatest coaches of all time, acknowledged describing mental toughness was difficult, but affirmed, "Mental toughness is essential to success" (Lombardi, 2012, p.65). Clearly, mental toughness is recognized by athletes, coaches, and sport psychologists as an important aspect of sport performance.

If mental toughness is essential for success, then it is necessary to understand the properties and processes associated with mental toughness. Researchers sought to determine this in recent decades. Sport scholars have defined mental toughness, but there is a lack of consensus among these researchers (Clough, Earle, & Sewell, 2002; Coulter, Mallet, & Gucciardi, 2010; Jones, Hanton, & Connaughton, 2002). Each describes mental toughness slightly differently, but generally, as a collection of attributes an individual possesses to perform at a high level in the face of challenges or adversity. For the purpose of this study,

Mentally tough individuals tend to be sociable and outgoing; as they are able to remain calm and relaxed, they are competitive in many situations and have lower anxiety levels than others. With a high sense of self-belief and an unshakable faith that they can control their own destiny, these individuals can remain relatively unaffected by competition or adversity. (Clough, et al, 2002, p. 38)

Facets of the athlete's experience influence the development and maintenance of mental toughness. These facets include the environment, coaches, teammates, experiences in sport, parents, competitors, training, and others. Researchers confirmed that coach behavior and the environment are factors influencing mental toughness among athletes (Butt, Weinberg, & Culp, 2010; Clough et al., 2002; Connaughton, Wadey, Hanton, & Jones, 2008; Drees & Mack, 2012; Gucciardi, Gordon, Dimmock, & Mallet, 2009; Thelwell, Such, Weston, Such, & Greenlees, 2010; Weinberg, Butt, & Culp, 2011). Coaches are a primary influence once the athlete is involved in sport. Peers and teammates serve as secondary sources for

development both in and out of sport (Coulter et al., 2010). The link between these primary relational influences and development, specifically of mental toughness, concern the satisfaction of the athlete's basic psychological needs by the coach and the coaching environment perceived by the athlete (Mahoney, Gucciardi, Ntoumanis, & Mallet, 2014). Coach influence on athlete development and specifically, mental toughness is through their relationship with the athletes and the environment they create around the athletes.

Mental toughness is considered an abstract concept in the literature. Several definitions and models are applied in research. Qualitative research on mental toughness continues to direct the discord surrounding the concept and definition. Interviews with athletes, Olympic or world champions, coaches, and sport psychologists confirmed 30 attributes of mental toughness. These attributes contributed to four dimensions within the framework of mental toughness, attitude/mindset, training, competition, and post-competition (Jones et al., 2002; 2007). A second definition conceptualized mental toughness as a personality trait. Much of the groundwork is based on the research of Kobasa (1979). The concept of hardiness emerged from her work and constituted three factors: Challenge, Commitment, and Control. Clough et al. (2002) added one additional factor, Confidence, thus his model contained four components comprising mental toughness: Confidence, Challenge, Commitment, and Control. These components (the 4Cs) comprise the model for mental toughness developed through interviewing athletes and reviewing the available research on the construct. The definition describes personality, psychological, and behavioral attributes of the individual. These attributes are trait-like and present themselves in competitive or adverse settings. It serves as a summation of their research, previous research, and the preliminary model of mental toughness, the 4Cs.

Thus the varied definitions seek to explain mental toughness and develop a model or set of attributes that comprise mental toughness. Clough et al. (2002) included four components in their trait-like model. Measures of mental toughness are derived from these definitions and models and many measures exist (PPI, PPI-A, MTQ48, MTI, MTS, MeBTough, and others). The models and definitions provided a platform for further research to understand mental toughness more deeply. The attributes

that comprise mental toughness, the development of these attributes, and influencing factors, (i.e. people or stages or situations), were examined.

Additional research has been conducted on coaches' roles in developing mental toughness. Coaches exert influence over the environment, personal interactions, and strategies implemented which facilitate mental toughness in athletes. A study presented perceptions of elite performers of the underlying mechanisms connected to the development of the 12 mental toughness attributes (Connaughton et al., 2008). The performers described the development of mental toughness in relation to three stages of their athletic process: early, middle, and late years. In each of the three stages, coaches and significant others were discussed as role models and as supporting factors for development. Coach's leadership, positive support, facilitation of environment, and teaching of skills and components of mental toughness were noted as underlying mechanisms for a number of the attributes. The recognition of the coach as an influential figure in relation to a diverse array of attributes is important to understanding the depth of the coach's influence on the athlete's development. This provided foundations for investigation into the strategies a coach could use or a model of the influence a coach has on mental toughness development.

Strategies used by coaches to build mental toughness were explored in a study of NCAA coaches' perceptions of mental toughness and those strategies they implemented themselves (Weinberg et al., 2011). These coaches described three higher order themes for the strategies they used in developing mental toughness including: facilitating a tough physical practice environment, creating a positive mental environment, and providing opportunities to build and awareness of mental toughness qualities. This validates the importance of the coach's role in mental toughness development because of the multi-dimensional influence they possess over the athlete.

A model for the coach's influence on the development of mental toughness was developed in a study interviewing coaches, who played and coached at the professional level (Gucciardi, Gordon, Dimmock, & Mallett, 2009). Coaches described their perceptions of how mental toughness is developed, how they influenced that development, and specific strategies applied in the development process. The model created includes four facilitators of development and one inhibitor. The four facilitators are coach-athlete relationship, specific strategies, coaching philosophy, and training environment. The inhibitor is negative influences and experiences, a further component of the coach's influence on the athlete's development. The coach-athlete relationship provides a

context for training and social support, open conversation, and was focused on building a healthy, long-term relationship between the coach and the athlete.

Coaches serve as a major influence on athletes' development, as a player and as a person, in and out of the sport setting. The context and quality of the relationship between coach and athlete is likely to facilitate or inhibit the development of the athlete. Coach-athlete relationship in connection with other psychological constructs, similar to mental toughness, are discussed further below. The majority of mental toughness research focuses on characteristics and attributes of mental toughness in elite athletes and coaches. Despite the frequency of mental toughness in the literature, mental toughness among collegiate athletes is considered one of the least understood populations in sport psychology (Jones, Hanton, & Connaughton, 2002).

The pilot study on mental toughness has a twofold purpose. One goal is to determine the degree of mental toughness reported by collegiate athletes. A second aim is to compare levels of reported mental toughness by gender (female, male), sporting venue (indoors, outdoors), and playing experience (< 10 years, 10+ years). Due to the preliminary nature of this study, no hypotheses are proffered.

Method

In order to prepare and conduct this study, a series of processes were conducted. The following conveys the essential information that will expose the procedures conducted to address the relevant purposes.

Participants

All National Collegiate Athletic Association (NCAA) Division I athletes at one university located in the southern United States were invited to participate in this study. Of the 18 teams, 15 agreed to participate (83.33%) including athletes (n=174) from 10 different sports. Among these athletes, 116 were female (66.67%) and 58 were male (33.33%). Most were in their first year (40%) and had an average of 2.03 years (s=1.102) of college playing experience and 11.33 total years (s=3.934) of playing experience in their respective sports. The majority of participants were athletes on individual/dual sport teams (76%).

Measures

Two surveys were administered to this sample. A basic Demographic Questionnaire, created for this project, was distributed. In addition, the Mental Toughness Questionnaire 48 (Clough, Earle, & Sewell, 2002) was administered. Both of these tools are described further.

Demographic Questionnaire

To access background data on each participant, a Demographic Questionnaire was developed. Information gleaned from this 10-item survey included age, gender, year in school, ethnicity/race, and additional background regarding their current and past sporting experiences.

Mental Toughness Questionnaire 48 (MTQ48)

Gathering data for the major purposes of this study entailed issuing the Mental Toughness Questionnaire 48 (MTQ48; Clough, Earle, & Sewell, 2002). This 48-item instrument measures components of mental toughness via four categories: Confidence, Control, Challenge, and Commitment. Each factor contains 12 items scored on a 5-point Likert type scale from strongly agree (5) to strongly disagree (1). The psychometric properties of this instrument have been verified (Clough, et al, 2002).

Procedures

At the outset of this project, permission was sought and obtained from the Institutional Review Board Committee for the Protection of Human Subjects. Following this process, all coaches (N=18) from one NCAA Division I university were sent a letter of invitation for their athletes. All coaches who agreed (n=15) were contacted to determine a time for the researcher to administer the two questionnaires. The researcher met individually with each team (generally before or after practice) to provide directions for questionnaire completion. On average, it took 15 minutes for athletes to complete both questionnaires. At the conclusion of the study, coaches were issued summary reports for their teams individually and in comparison to all of the other teams.

Results

To address the four research questions, a series of analyses were performed. Each of these processes is detailed in the section below.

Mental Toughness of College Athletes

As this was an exploratory investigation, the first question sought to ascertain levels of mental toughness among college athletes. Overall, athletes reported relatively high levels of the four mental toughness factors. When comparing by sport, a series of oneway ANOVAs were performed. Results showed no reported differences in mental toughness in the factors of Control, Challenge, and Commitment. However, findings demonstrate that athletes in three sports (men's basketball, women's cross country, women's riflery) reported significantly higher scores on the Confidence factor than those athletes competing in women's swimming, tennis, and golf, $F=2.158$, $p<.05$. See Table one for relevant means and standard deviations.

Table 1.

Means and Standard Deviations of Confidence by Sport

Sport	Mean	SD
Basketball (M)	4.09*	.475
Cross Country (W)	4.01*	.202
Riflery (W)	4.00*	.405
Swimming (W)	3.53	.529
Tennis (W)	3.46	.427
Golf (W)	3.14	.566

* $p < .05$

Mental Toughness and Gender of College Athletes

The second question of interest queried whether males or females reported higher levels of mental toughness. In order to investigate this question, a series of four independent sample t-tests were conducted. The four mental toughness factors served as the dependent variables; gender (male, female) served as the independent variable. Results demonstrated intriguing patterns of mental toughness reporting. Overall males scored higher on each of the four factors (Confidence, Control, Challenge, Commitment). These differences were statistically significant for Confidence and Control. The outcomes for Challenge and Commitment bordered significance. See Table 2.

Table 2.

Means and Standard Deviations of Four MTQ48 Factors by Gender

MT Factor	Mean		SD	
	Male	Female	Male	Female
Confidence	3.93*	3.69	.516	.489
Control	3.63*	3.48	.363	.380
Challenge	3.84*	3.71	.449	.463
Commitment	3.97	3.84	.460	.501

* $p < .05$

** $p < .01$

Mental Toughness and Sporting Venue

The third point of inquisition tested athletes' perceptions of mental toughness by sporting venue. Athletes were divided into two groups based on whether they participated in an indoor (i.e., basketball, volleyball) or an outdoor (soccer, golf) sport. In order to investigate this question, a series of four independent sample t-tests were conducted. Again, the four factors of mental toughness factors were entered as outcome variables; sporting venue (indoor, outdoor) served as grouping variable. Results demonstrated that location of sporting contest, whether indoors or outdoors, did not influence perceptions of

mental toughness. In short, there were no reported differences in any of the four MTQ48 factors by type of sporting venue.

Mental Toughness and Playing Experience of College Athletes

The final question posed inspected the varied reporting of mental toughness by years of sport playing experience. Athletes were divided into two groups; those with 1-9 years of playing experience were compared to those athletes with 10 or more years of experience. Results of a series of four independent sample t-tests showed that there were no reported differences in mental toughness by years of sporting experience. Results demonstrated intriguing patterns of mental toughness reporting. In fact, many of the mean scores were almost identical. See Table 3 for the mean comparisons.

Table 3.

Means and Standard Deviations of Four MTQ48 Factors by Playing Experience

MT Factor	Mean		SD	
	1-9 years	10+ years	1-9 years	10+ years
Confidence	3.81	3.75	.512	.521
Control	3.81	3.75	.388	.371
Challenge	3.80	3.74	.421	.492
Commitment	3.94	3.88	.409	.520

Discussion

This study explored mental toughness among a group of intercollegiate athletes. Using the model of mental toughness posed by Clough and his colleagues (2002), athletes reported perceptions of mental toughness based on four components: Confidence, Control, Challenge, and Commitment.

Four research questions were subjected to a series of analyses. The following section serves to interpret these results.

Mental Toughness of College Athletes

With the limited research on mental toughness and the diverse array of conceptualizations, this study sought to provide an exploratory overview of mental toughness perceptions among a group of NCAA Division I athletes. Results of this investigation show that the three factors associated with Kobasa's (1979) original conception of hardiness, Control, Challenge, and Commitment, do not differ among college athletes representing varied sports. However, the new component posed by Clough et al. (2002), Confidence, did vary among some of the sport teams. Specifically, athletes competing in men's basketball, women's cross country, and women's riflery

reported higher levels of Confidence than female athletes in swimming, tennis, and golf. In order to tease out the influences, further inquiry into gender appears to be warranted as all the participants in the latter sports reporting lower Confidence were women. The results based on gender relative to the current study are depicted below.

Mental Toughness and Gender of College Athletes

Considering the findings found regarding gender and Confidence in the current study, it is especially intriguing to review the overall results on gender and mental toughness. Overall, results demonstrated that males tend to report higher levels of mental toughness than females. This finding was significant on the factors of Confidence and Control; results on Challenge and Commitment approached significance. These findings certainly help to explain the outcomes on Confidence as the results above demonstrate. Furthermore, males tend to score higher than females in total mental toughness when analyzing the factors of Challenge, Control, and Confidence (Nicholls, Polman, Levy, & Backhouse, 2009).

Mental Toughness and Sporting Venue

There is no research examining the influence of sporting venue, whether indoors or outdoors, on any psychological factors. Thus, exploring the potential impact of venue on mental toughness was deemed worthy of study. The results of the indicated that there was no significant differences between athletes who performed indoors (basketball, volleyball) versus outdoors (soccer, golf). Regardless of where athletes trained and competed (indoors or outdoors), they reported moderate to high levels of mental toughness on all four factors: Confidence, Challenge, Commitment, and Control. This type of comparison has never been studied so future research may be warranted.

Mental Toughness and Playing Experience of College Athletes

While most collegiate athletes undergo years of experience training for their sport prior to college, there are still variance in the amount of prior competitive experience among Division I athletes. Thus, the final question explored mental toughness patterns by playing experience. Athletes were divided into two groups: those with 1-9 years of playing experience and those with 10 or more years. Despite the range in competitive years reported by the sample, there were no significant differences in mental toughness scores. Regardless of past competitive sport experience, athletes reported moderate to high levels of mental toughness as gauged by the four components: Confidence, Challenge, Commitment, and Control. It appears that once an athlete has reached the NCAA Division I level, years of playing experience

appear to become less important. Again, further exploration would likely be able to continue clarify these relationships.

Summary

The abstract concept of mental toughness is commonly alluded to in sport culture. However, it is only recently that serious efforts have been exerted to explore, define, and measure mental toughness. The purpose of this study was to pose an exploratory effort to determine perceptions of mental toughness among a sample of NCAA Division I intercollegiate athletes. Overall results demonstrated that college athletes report moderate to high levels of mental toughness operationalized as Confidence, Challenge, Commitment, and Control. There appears to be some connection between gender and perceptions of mental toughness. Before these results can have valuable application, further empirical inquiry is recommended.

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