THE INFLUENCE OF COACHING STYLE ON

MENTAL TOUGHNESS IN HIGH SCHOOL

BASEBALL PLAYERS

by

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ABSTRACT

The purpose of this study is to identify the influence of coaching style on overall mental toughness in high school baseball players. This is a step toward understanding the influence coaches have on the mental toughness of their athletes. Overall mental toughness was measured using the MTQ-18, a revised version of the MTQ-48 questionnaire. Coaching style was measured using the Leadership Scale for Sports (LSS) questionnaire. Pearson product correlation was used to examine the relationship between the five different dimensions of coaching style and athletes' overall mental toughness scores. Descriptive statistics such as mean, standard deviation, median, mode, and range were also used to analyze the data. Although some variation existed, all of the teams had similar descriptive scores. No statistical significance was observed between mental toughness and the five dimensions of coaching style. After deconstructing mental toughness scores, none of the four dimensions of mental toughness had a statistically significant relationship with the dimensions of coaching style. Future research involving coaching style should investigate fluctuations in mental toughness throughout the sport season or attempt to quantify how much influence a coach can have on the mental toughness of their players.

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INTRODUCTION

Millions of students compete in high school athletics every single year, but few will ever be recruited by an NCAA college, and even fewer will be drafted by a professional sports team. Of the nearly 500,000 high school baseball players, only about 7.1% will play for an NCAA Division I, II, or III college ("Estimated Probability of Competing in College Athletics", 2017). Of the nearly 35,000 NCAA baseball participants from all divisions, only 9.1% will go on to be drafted by the MLB ("Estimated Probability of Competing in Professional Athletics", 2017). With so few playing spots available for such a tremendous number of players, scouts are constantly searching for a way to differentiate athletes and predict their success. Mental toughness may provide the answer scouts are searching for. Players scoring high in mental toughness have been found to outperform their less mentally tough counterparts (Gucciardi & Jones, 2012). Research also suggests mentally tough players have better coping skills and are better at avoiding distractions (Gould et al., 2002; Jones et al., 2002). However, even though the research on mental toughness has been extensive, questions regarding the development and maintenance of mental toughness still exist. The influence, positive or negative, coaches have on mental toughness in their athletes remains an area requiring further questioning and research.

Mental Toughness

The construct of mental toughness has been interpreted a variety of ways and possesses several definitions. These definitions are subject to individual interpretation and differ by the context and the population in question. In general, mental toughness encompasses the ability to effectively respond to life's challenges, cope with life's stressors, and perform optimally under pressure (Strycharczyk, 2014). Mental toughness is not a concept confined to athletics; anyone in any profession can display mental toughness. However, the role of mental toughness in sport

continues to expand with more research. Coaches and athletes alike recognize the importance of the mental side of sport, and mental toughness is one important component to developing psychological skills in athletes.

Origins of mental toughness. The concept of mental toughness found its beginnings as an unforeseen consequence of what would later become a ground-breaking study. In 1979, researcher Suzanne Kobasa examined the effect of stressful life events on illness in middle and upper level business executives. Through her research, she established the principle of hardiness, a term now used to describe an individual's capacity for enduring hardship and overcoming adversity. Kobasa (1979) identified three subcomponents of this concept of hardiness: Challenge, Commitment, and Control. The executives who displayed higher levels of hardiness were found to fall victim to illness in the wake of stressful events less frequently than their less hardy counterparts. The three hardiness subcomponents identified ultimately gave rise to the notion of mental toughness, and still remain three of the four key factors (Kobasa, 1979).

Nearly two decades after Kobasa's (1979) research, the fourth component of mental toughness emerged. Through a systematic review of previous research along with three studies of their own, Clough and colleagues (2002) defined mental toughness by incorporating practical and theoretical characteristics that researchers, coaches, and athletes identified as important. These findings confirmed Kobasa's original three subcomponents and added a fourth: Confidence (Clough et al., 2002). Confidence emerged as an important factor in mental toughness specifically related to the amount of playing time the athlete received as well as the coach-athlete relationship (Clough et al., 2002). These four components, commonly referred to as "the 4 C's of mental toughness", provide the framework in which the model of mental toughness still operates.

Defining mental toughness. One issue still plaguing the mental toughness literature is the lack of differentiation between the definition of mental toughness and aspects that are needed to be a mentally tough individual (Jones et al., 2002). Ultimately, the term 'mental toughness' can be used to describe a set of psychological characteristics that facilitate high performance (Butt, Weinberg, & Culp, 2010; Jones et al., 2002).

Defining the subcomponents of mental toughness. Since Clough and colleagues (2002) research, the 4 C's (Challenge, Commitment, Control, and Confidence) have been applied and studied in various settings and populations including Australian football, youth tennis, and male sprinters, just to name a few (Gucciardi, 2010; Houwer et al., 2017; Beckford et al., 2016). To truly understand the research literature, one must first become familiar with each of these four subcomponents. Challenge is the first subcategory of mental toughness where one perceives life's difficulties as opportunities to grow rather than detriments (Kobasa et al., 1982). It encompasses an acceptance of challenges as a natural part of life and the view that life's challenges should be welcomed not feared (Kobasa et al., 1982). Commitment, the second subcategory, is characterized by perseverance through life's stressors (Kobasa, 1979). Control, the third subcategory, involves feeling and acting in ways that influence the world even through times of distress (Kobasa et al., 1982). Confidence, the fourth and final subcategory, relates to performance, encompassing high self-belief, an ability to remain calm and focused, and feelings of competitiveness in a variety of situations (Clough et al., 2002). Since these subcomponents form the fundamental foundation of mental toughness, they represent subscales for many of the instruments used to measure mental toughness.

Mental Toughness in Sport

While the 4 C's remain core components, mental toughness in the context of sport often encompasses additional factors specific to athletes. The development of mental toughness, like any other personality quality, has been found to start at a young age and continue to develop and flourish (or decline) over one's athletic career (Connaughton et al., 2008). In youth athletes, a "challenging, rewarding, and enjoyable" motivational climate during the early years of participating in sport is perceived to help foster the development of mental toughness (Connaughton et al., 2008, p. 93). Parents and coaches must work to create a sporting environment that requires the right amount of effort for the child's skill level, provides opportunities for attaining extrinsic and intrinsic rewards, and allows the child to have fun. Furthermore, competitive experiences play a key role in the athlete's psychological development as the individual transitions into the middle years of sport participation (Connaughton et al., 2008). Younger athletes show more variability in mental toughness scores during the performance of sport and are more sensitive to positive and negative events that occur (Houwer et al., 2017). Therefore, consistency and stability are important psychological factors to learn and develop during the early and middle years of sport participation. Lastly, a strong, internal desire to succeed along with intrinsic motivation, the correct response to competitive anxiety, and the ability to apply mental skills are fundamental to the maintenance of mental toughness in later years of sport participation (Connaughton et al., 2008). In other words, athletes should not prioritize extrinsic rewards like trophies, should use the anxiety associated with competition as a means of facilitating higher performance, and should apply various psychological skills such as coping to really maintain and continue to develop mental toughness in their sport. It is essential for athletes to continue to practice the skills learned during youth sport if they want to develop and maintain them throughout higher levels of competition.

Through qualitative investigations of elite international athletes (Olympic or Commonwealth Games), Jones and colleagues (2002) established the following definition of mental toughness in sport:

> 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, lifestyle) that sport places on a performer. Specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure (Jones, Hanton, & Connaughton, 2002, p. 209).

This definition illustrates the importance of coping with life's stressors, whether personal or related to the athlete's sport, that can adversely influence the athlete's performance. Furthermore, it highlights critical components that are essential for staying in control of one's emotions while under pressure and not allowing high intensity situations to negatively alter an athlete's performance.

When defining mental toughness in sport, it is important to consider both coaches' and athletes' opinions. Sometimes coaches and athletes assign different values to the subcomponents of mental toughness, but most agree on the importance of "resilience, perseverance, and the ability to successfully deal with adversity" (Gould et al., 2002, p. 199). So, coaches and athletes share a common ground in thinking that coping skills and remaining in control of the situation are essential to being mentally tough. This ties in with the idea that maintaining focus on relevant information is an important aspect of mental toughness. Mentally tough individuals know where to aim their attention, focusing on aspects of the situation they can control, narrowing their focus to the task at hand, and avoiding distractive thoughts (Gould et al., 2002). These mentally tough

athletes are able to focus on relevant information that will enhance their performance and filter out information that will only act as a detriment towards success.

    Mental toughness in team sports. Approaches to developing and maintaining mental toughness have been found to sometimes differ depending on whether the athlete is competing in an individual or team sport. Individual and team sport athletes face different types of stressful conditions and therefore show a difference in the application of mental skills and motivations for success (Kajbafnezhad et al., 2011). Mental skills are an all-encompassing term for many of the subcomponents of mental toughness and motivation has to do with the desire and determination for achievement. While there is overlap between individual and team sports, several features including developing a positive, challenging, and highly-competitive practice environment, building confidence through a mutually trustworthy coach-athlete relationship, and allowing athletes to observe and visualize success were perceived to be important components to developing mental toughness in team sport athletes specifically (Butt et al., 2010). As mentioned earlier, it is important for athletes to practice in an environment that is neither too easy nor too challenging. Furthermore, athletes need to trust the coaches' ability to train them for success and in turn know that the coaches trust the athletes to perform successfully. Lastly, coaches have to set realistic goals and expectations that allow the athletes to strive for successes that can realistically be accomplished.

    Because coaches' leadership and relationship with athletes play a pivotal role, research has been conducted to study the best ways for coaches to enhance the development of mental toughness. Strengths based coaching and psychological skills training may be most optimal for developing mental toughness in team sport athletes (Gordon, 2012). This means that the coach highlights and focuses on what the players are doing right and successful rather than harping on

players' mistakes and failures. In addition to fostering an ideal environment for the growth of mental toughness, coaches have been found to establish primary characteristics used to identify mental toughness in their athletes (Ragab, 2015). Emotional control and confidence are among the key factors in predicting competitive success and mental toughness in players (Ragab, 2015). This means that athletes who remain calm under pressure, do not allow emotions to negatively affect performance, and remain confident in their abilities are pivotal predictors of success and high mental toughness.

  Mental toughness in baseball. Although baseball is considered a team sport, it is played much like an individual sport, making it highly unique (Lidor & Henschen, 2003). Baseball players credit a majority of their performance as an athlete to mental and emotional factors rather than physical. (Lidor & Henschen, 2003). The fact that baseball performance is highly affected by mental factors makes high mental toughness an important characteristic for players to possess. The little research that exists specifically analyzing mental toughness in the sport of baseball primarily focuses on pitchers, which makes it difficult to generalize the results to the entire sport (Couch, 2004). For closing pitchers in particular, the research suggests the last three outs are perceived to require the most amount of mental toughness for success (Couch, 2004). The last three outs tend to be a highly stressful situation, requiring the confidence and control components of mental toughness. Furthermore, the subcomponents of a concept sometimes referred to as "the closing mentality," the idea of using the stress of the final inning as fuel to perform better, have been found to align closely with many of the subcomponents of mental toughness (Couch, 2004, p. 56). Again, the subcomponents refer to Control, Commitment, Challenge, and Confidence. Mentally tough pitchers have the ability "to not give in" no matter how difficult the situation may be (Coleman, 2009, p. 48). These pitchers do not succumb to the

external pressure of the environment and continue to perform successfully through stressful situations. Closing pitchers may require increased mental toughness but starting pitchers have been found to benefit from it as well, since they deal with a variety of high-stress situations throughout the game. The research suggests "positive or appropriate thinking patterns" are directly related to a power pitcher's ability "to not give in," and these thinking patterns were developed through repetition along with high intensity training programs (Couch, 2004, p. 56; Coleman, 2009, p. 48). Starting pitchers are center stage for the majority of the game, meaning they have to endure a stressful environment over a longer period of time compared to closing pitchers, and starting pitchers must be able to sustain high performance for that longer amount of time as well. Other positions within the sport might show similar results, but existing research remains limited.

Measuring Mental Toughness

Measurements of mental toughness first started with Kobasa's 1979 research. Because a standardized measure had yet to be created, she used a separate instrument for each of the subcategories identified above. These measurements included questionnaires designed to determine a subject's locus of control, level of achievement, leadership orientation, and level of dominance (Kobasa, 1979). Rather than use a variety of questionnaires for each subcategory, other researchers opted to use a semi-structured interview format to study these psychological characteristics in greater depth (Gould et al., 2002).

As the concept of mental toughness emerged more prominently in the context of sport, the need for a standardized measurement grew. In 2002, the MTQ48 was invented to evaluate the four subcategories of Challenge, Commitment, Control, and Confidence (Clough et al., 2002). This 48 item questionnaire, proven both reliable and valid, was created as a direct result of a

systematic review of the research literature along with a combination of theoretical and practical perspectives (Clough et al., 2002).

While the MTQ48 appears often in the research literature, other inventories have shown reliability in assessing mental toughness in various populations within a sport context. The Sport Mental Toughness Questionnaire (SMTQ) measures generalized mental toughness in athletes through three subcategories: Confidence, Constancy, and Control (Sheard, Golby, & van Wersch, 2009). The SMTQ sought to establish questionnaire items more closely applicable to sport, but faced issues of divergent validity (Sheard et al., 2009). The Australian football Mental Toughness Inventory (AfMTI), created for the purpose of only one sport, measured four components of mental toughness specifically found in Australian football: "thrive through challenge, sport awareness, tough attitude, and desire success" (Gucciardi et al., 2009, p. 201). Like the AfMTI, several other sport-specific measures exist, often building off of the MTQ48 structure, to include important features explicit to the sport in question. However, many of these measures are limited in practical application and lasting impact since they can only be applied within the context of that sport (Gucciardi, 2012). Although the MTQ48 is often applied to sport, it is not a sport-specific measurement and can therefore be applied to most situations and populations.

Coaching Styles

The term coaching style is used to describe the type of leadership a coach employs when interacting with the athletes and fellow coaches under them. Leith (1949) identified three distinct coaching styles. The first, directive leadership, was found to be an authoritarian style coach creating a task-oriented atmosphere (Leith, 1949). An authoritarian coach maintains complete control with little to no autonomy given to the athletes and other subordinate staff members.

Task-oriented atmospheres focus on specific activities that will lead to the desired outcome, typically focusing on physical rewards such as winning the game. The second style, supportive leadership, is a more democratic-style coach creating a relationship-oriented atmosphere (Leith, 1949). Democratic coaches value input from subordinates and allow athletes and fellow coaches to have some level of say in the decision-making process. A relationship-oriented atmosphere focuses more on the intrinsic values of the sport rather than attaining physical rewards such as valuing the process over the outcome. The third and final style, participative leadership, is a combination of the two previous styles in which the coach values both the task and building of relationships (Leith, 1949). Although the coach still has final say, participative leadership allows subordinates some level of autonomy. These coaches spend time developing characteristics that will lead to both extrinsic and intrinsic rewards, placing equal value on both the process and the outcome.

Coaches employs their own style when instructing their athletes and fellow coaches, which in turn creates a certain atmosphere (Leith, 1949). How effective each coach's specific style is depends on the needs and demands of the sport and athletes, but research does suggest the effectiveness of certain styles over others (Gordon, 2012). Many coaches employ strategies that exploit players' weaknesses in an attempt to correct them, but research argues that strengths-based coaching, "spotting and exploiting, teams' and athletes' strengths," is significantly more advantageous in team sport (Gordon, 2012, p. 212). Strengths-based coaching may seem more intrinsic in nature, but it can be applied to all coaching styles. Whether focused on the process or the outcome, strengths based coaching simply focuses more heavily on what is being done right rather than dwelling on what went wrong. The effectiveness of strengths-based coaching stems from the mutually trusting atmosphere it creates between the coaches and players (Gordon,

2012). An example of this mutual trust is when the coach believes in the athletes' capabilities and the athletes trust that the coach knows best.

Coaches' general attitudes and personalities are additional dimensions to consider when evaluating coaching style. Coaches across the board rate the category of coachability as the most important factor in determining athletic ability of players, but coaches higher in optimism rank it higher than their lower optimism counterparts (Solomon, 2015). This research suggests a connection between more positive attitudes in a coach and their perception of the importance of a good attitude in their players (Solomon, 2015). This means these coaches care about the approach taken to develop athletes and in turn want athletes to approach practice and development in a positive way. Furthermore, athletes were more satisfied with coaching leadership when there was an emphasis on training and instruction (Chelladurai, 1984). This emphasis ties back in with the idea of a task-oriented atmosphere, an environment where there is high emphasis on activities that will foster more success.

Relationship Between Coaching Style and Player Performance

Coaching style and player performance have an intriguing relationship. Not only can coaching style affect player success, but player performance can in turn influence athletes' perception of coaching style effectiveness (Mata & Da Silva Gomes, 2013). In other words, coaching style and athlete performance are constantly affecting one another. For example, winning teams were found to more positively rate coaches' leadership style than losing teams (Mata & Da Silva Gomes, 2013). Naturally, if a team is winning the athletes are less likely to criticize the approach the coach is taking, but when practice is not paying off athletes are less satisfied with coaches' abilities. It is also interesting to note that individual performance was not a factor affecting leadership satisfaction, but team performance was (Chelladurai, 1984). This

means if an individual athlete does not perform well it does not affect how that player views the leadership of the coach, but the team performing badly does impact the view of leadership.

Relationship Between Mental Toughness and Coaching Style

The literature provides a solid base of support for the influence coaches can have on the development and flourishing of mental toughness in team sport athletes. Coaches were found to be "a primary influence on athlete psychological development" (Gould et al., 2002, p. 200). This means coaches have a tremendous impact in developing mentally skilled athletes. Coaches were found to have a profound influence on athletes in these main areas: "Goal setting, team cohesion, mental practice-imagery, and communication" (Gould et al., 1987, p. 305). So, coaches can evolve and develop the athletes' ability to set realistic goals, work well with teammates, learn to incorporate mental performance techniques, and communicate more effectively.

The research suggests coaches' influence on mental toughness can be both positive and negative. For example, creating a challenging training environment aided players in developing a high regard for "hard work, self-motivation, and physical toughness" whereas a training environment that does not adequately challenge the players hindered the psychological development process (Gucciardi et al., 2009, p. 1491). This again ties in with the notion that the training environment must be sufficiently difficult for the athlete to develop the different subcomponents of mental toughness. Furthermore, a physically vigorous practice environment was shown to be critical in the process of developing resiliency, also a major factor in mental toughness (Weinberg, 2011). Reinforcing prior research on the benefits of strengths-based coaching, it was found that focusing too heavily on player weaknesses while under-highlighting player strengths negatively impacted the athlete's ability to handle pressure and bounce back from hardship (Gucciardi et al., 2009). So, coaches allowing failure to overshadow success

makes players less resilient. Likewise, creating a positive psychological environment was important for developing confidence and persistence (Weinberg et al., 2011). A winning or achievement focus by the coach was found to negatively impact mental toughness in players by focusing their attention on aspects of the game outside the scope of their control and diminishing the value of individual contributions and performance (Gucciardi et al., 2009). Therefore, if athletes do not feel valued, the coach-athlete relationship suffers.

Mutual trust and respect between the coach and athlete are necessary components for creating an ideal environment for the development of mental toughness. When coaches exhibit supportive behaviors and facilitate a mutually trustworthy environment, they positively influence the psychological development of their athletes (Gould et al., 2002). Furthermore, a strong coach-athlete relationship was necessary for the coach to foster mental toughness development, and an athletes' trust and respect for their coach was found necessary to ensure player willingness to participate in what the coach asked of them (Gucciardi et al., 2009). However, it is important to note that an athlete's prior experience in their sport was essential to the coach's ability to transform a more generalized form of mental toughness into sport specific mental toughness (Gucciardi et al., 2009). So prior sport experience can aid or hinder the current coach's ability to develop mental toughness skills in the athlete.

Coaches' perceptions of their role in developing mental toughness. Research suggests some differences between coaches' and athletes' perception of the coaches' role in developing mental toughness in athletes. Increasing sport intelligence, having players evaluate individual and team performance, individual conversations with players about their performance, and exposing players to game-like situations were specific strategies coaches believed effective in the development of mental toughness (Gucciardi et al., 2009). So, coaches supposed the

development of mental toughness was dependent on players being able to analyze their performance as well as being prepared for both the physical and mental demands of the sport.

Most of the research literature focuses on players' perceptions of their coaches' contributions to developing mental toughness, which is examined below, rather than on the coaches' perception of their role in the development process. However, it is worth noting that the importance of "psychological skills, motivation to succeed, and resilience" were overlapping categories of both coaches' and athletes' perceptions of mental toughness that could be influenced by coaches (Weinberg et al., 2011, p. 170). Therefore, both coaches and athletes believe that coaches have a primary role in developing mental skills.

Player perception of coaches' role in developing mental toughness. Research suggests players perceive coaches as influential to the growth and flourishing of their mental toughness in a variety of ways. "Coaches' behaviors and their relationships with their athletes" were identified by players as impactful to individual character development and mental toughness (Rodahl et al., 2015, p. 429). A strong coach-athlete relationship should lead to a mutually trusting relationship, and as mentioned above, certain coaching behaviors are more effective than others.

In addition to behaviors and relationships, athletes perceived the following components as critical to the development and maintenance of mental toughness: coaches' knowledge of mental toughness, hearing about past experiences with mental toughness, and coaches' introduction of the concept of mental toughness but allowance of a professional sport psychologist to take over in later stages (Philippe et al., 2016). So even though coaches are a primary facilitator of mental toughness, athletes expect a professional to take over as players reach higher levels of competition. In addition, players perceived coaches as playing a critical role in the development and refinement of mental strategies like emotional reflection, success analysis, and situational

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analysis (Philippe et al., 2016). This means athletes believe coaches play a key role in teaching

players how to positively interpret performance and cope with emotional stressors.

Measuring Coaching Styles

In 1980, Chelladurai and Saleh developed and refined the Leadership Scale for Sports

(LSS) measurement. This measurement was designed to identify characteristics athletes desire in

a leader and the leadership style coaches implement by asking a series of questions that fall

under five subcategories: training and instruction, democratic behavior, autocratic behavior,

social support, and positive feedback (Chelladurai & Saleh, 1980). In addition to there being

both an athlete and coach version of the questionnaire, various researchers have adapted the LSS

measurement to fit specific sports. For example, the LSS-3 was adapted specifically for male

soccer coaches (Ruiz-Barquín & de la Vega-Marcos, 2015). Researchers found the categories of

positive feedback and democratic behavior to be similar to other sports that had used the LSS

measurement but found higher scores in perception of autocratic behavior and lower scores in the

dimensions of training and instruction as well as social support (Ruiz-Barquín & de la Vega-

Marcos, 2015). Based on scores of the various dimensions of the LSS, researchers can identify

which of the three coaching styles (authoritarian, supportive, or participative) the coach in

question employs.

<div align="center">METHODS</div>

Participants

Participants for this study were recruited via email. Head and assistant coaches from

various 5A and 6A Texas high school baseball programs were contacted and requested to

participate. In Texas, 5A programs are schools with a 1,100 to 2,149 total student enrollment. 6A

programs are schools with 2,150 or more total students enrolled. The participant population

consisted of 56 varsity male baseball players and 6 male coaches from four high schools.

Procedures and Instruments

Players were administered the MTQ-18 questionnaire, a revised version of the MTQ-48, to

assess their overall mental toughness. The MTQ-18 still contained questions pertaining to each

of the four dimensions of mental toughness: Control, Confidence, Commitment, and Challenge.

Coaches were administered the Leadership Scale for Sports questionnaire to assess their

coaching style across five dimensions: training and instruction, democratic behavior, autocratic

behavior, social support, and positive feedback. Hard copies of the questionnaires were

administered in person to both coaches and players. Online copies were administered via email

through Google Forms.

Analysis

Data analysis included descriptive statistics such as mean, standard deviation, median,

mode, and range of scores. Pearson product correlation was used to examine the relationship

between the five different dimensions of coaching style and athletes' overall mental toughness

scores.

<div align="center">RESULTS</div>

Descriptive statistics for the athletes' mental toughness scores were expressed with mean

and standard deviation as well as median, mode, and range as shown in Table 1. Participants

received a score out of five per question with a total of ninety points possible. The mean score of

each team showed slight variation which can be a result of the differing number of participants

per team or a number of factors that influence mental toughness. Individual scores were specific

to a participant's life experience and the instrument used did not account for specific social and educational factors.

Table 1

Mental Toughness Descriptive Statistics

	School 1	School 2	School 3	School 4
Mean +/- St. Dev	66.36 +/- 5.82	62.81 +/- 12.32	59.09 +/- 10.70	60.64 +/- 7.02
Median	66	65	60	62
Mode	66	76	64	52
Range	52-75	37-83	33-74	52-71

Coaches were evaluated amongst each of the five dimensions of coaching style: training and instruction, democratic behavior, autocratic behavior, social support, and positive feedback. Coaches received a score out of five on each of the five dimensions. Descriptive statistics were expressed by school with mean and standard deviations as seen in Table 2.

Analysis of overall mental toughness scores revealed no statistically significant relationship with any of the five dimensions of coaching style, training and instruction, autocratic behavior, democratic behavior, social support, and positive feedback. After deconstructing overall mental toughness scores into the four c's (Control, Confidence, Commitment, and Challenge), still no statistically significant relationship existed. Correlations between the dimensions of the MTQ-18 and the dimensions of the Leadership Scale for Sports can be seen in Table 3.

Table 2

Coaching Style Descriptive Statistics

	School 1	School 2	School 3	School 4
Training & Instruction	4.69 +/- .44	4.85	3.88 +/- .05	4.85
Democratic Behavior	3.28 +/- .86	3.33	3.12 +/- .55	3.33
Autocratic Behavior	2.10 +/- .14	3.60	2.70 +/- .42	3.00
Social Support	3.38 +/- .18	4.63	3.56 +/- .09	4.25
Positive Feedback	4.20 +/- 1.13	4.80	3.50 +/- .14	5.00

Table 3

Correlation Between Coaching Style and Mental Toughness Scores

	MTQ Score	Control	Confidence	Commitment	Challenge
Training & Instruction	.086	-.011	.103	.134	.097
Democratic Behavior	-.232	-.180	-.103	-.252	-.338
Autocratic Behavior	-.039	-.053	.059	-.050	-.169
Social Support	-.032	-.065	.059	-.028	-.134
Positive Feedback	-.025	-.105	.045	.025	-.036

DISCUSSION

The purpose of this study was to determine the relationship between coaching style and athletes' overall mental toughness scores. The results of this study do not show a statistically significant relationship between mental toughness scores and the five dimensions of coaching style: training and instruction, democratic behavior, autocratic behavior, social support, and

positive feedback. These results disprove my original hypothesis that coaches scoring higher in supportive behavior would have athletes with higher overall mental toughness scores. The results of this study could be due to a number of factors.

Individual Differences

The factors that influence mental toughness can be difficult to quantify due to the number of individual differences that can affect each of the four dimensions (Control, Challenge, Commitment, and Challenge). Differences such as gender, age, and sporting experience were found to have a significant relationship with mental toughness (Nicholls et al., 2009). The MTQ questionnaire is limited in that it only identifies how the individual is feeling on a specific day at a specific time, but scores can fluctuate depending on a number of individual and situational factors. Additionally, the questionnaire does not account for educational and socioeconomic factors, both of which may play a role in a high school athlete's mental toughness.

Sport Participation

Early sport participation and specialization have become increasingly popular in today's youth athletics. Many of the players surveyed for this project started playing baseball at a very young age and, as a result, had several coaches prior to playing for their high school team. It is possible that by the time athletes reach the high school level, the extent to which their coach can shape their mental toughness is limited due to the influence of prior coaches.

Additionally, baseball is a unique sport because, while it is considered a team sport, it is played much like an individual sport (Lidor & Henschen, 2003). Neither the MTQ-18 nor the Leadership Scale for Sports questionnaires have questions specific to the sport. All of the participating teams were in-season and practiced several times per week. It is reasonable to

believe an athletes' participation in baseball specifically as well as their success as an athlete and as a team may affect their overall mental toughness.

Project Limitations

This project had several limitations. Mental toughness questionnaires were administered to athletes only one time toward the end of the high school season, capturing only what athletes were feeling that particular day and not accounting for possible fluctuations throughout the season. Most of the athletes surveyed were upper classmen, many of whom had worked with their coaching staff for several seasons. Additionally, players were not asked if they played for another team besides their high school team. Lastly, coaches' mental toughness scores were not collected and were therefore not available for comparison.

Future Research Suggestions

Future research involving the influence of coaching style on mental toughness should survey the athletes at the beginning and end of the season at minimum. Athletes competing on multiple teams should be disqualified from participation. Other aspects of the coach-athlete relationship besides coaching style may affect an athlete's mental toughness and should be explored in future research. Furthermore, coaches' mental toughness scores should be identified and compared with the mental toughness scores of their athletes. Future research in sport should also try to account for extrinsic factors such as socioeconomic, social, and educational status and how they affect the specific athlete group in question.

Future research on mental toughness in general should identify which of the four dimensions are the least and most susceptible to external influences.

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