THE RELATIONS BETWEEN PERCEIVED PARENT, COACH, AND PEER CREATED
MOTIVATIONAL CLIMATES, GOAL ORIENTATIONS, AND MENTAL
TOUGHNESS IN HIGH SCHOOL VARSITY ATHLETES

Nicholas M. Beck

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APPROVED:

Trent A. Petrie, Major Professor
Scott Martin, Committee Member
Edward Watkins, Committee Member
Camilo Ruggero, Committee Member
Vicki Campbell, Chair of the Department of
Psychology
Mark Wardell, Dean of the Toulouse Graduate
School
Determining the factors that contribute to mental toughness development in athletes has become a focus for researchers as coaches, athletes, and others extol its influence on performance success. In this study, we examined a model of mental toughness development based on achievement goal theory, assessing the relations between motivational climates, goal orientations, and mental toughness. Five hundred ninety-nine varsity athletes, representing 13 different sports from six different high schools in a southwestern United States school district, participated in the study. Athletes completed self-report measures assessing parent, peer, and coach motivational climates, goal orientations, and their mental toughness. Initially, I examined the measurement model and found it fit the data well both in the exploratory (SRMR = .06; CFI = .94) and confirmatory (SRMR = .06; CFI = .95) samples. Second, the structural model was examined and found to fit the data well in both the exploratory (SRMR = .08; CFI = .93) and confirmatory samples (SRMR = .07, CFI = .95). Parent task-involving climate, ($\beta = .55; p < .05$) and coach task-involving climate ($\beta = .32; p < .05$), but not peer task-involving climate ($\beta = .05$), were associated with task goal orientation ($R^2 = .57$). Ego goal orientation ($R^2 = .32$) was explained by peer ego-involving climate ($\beta = .15; p < .05$), parent ego-involving climate ($\beta = .39; p < .05$), and coach ego-involving climate ($\beta = .16; p < .05$). Finally, only task goal orientation ($\beta = .75; p < .05$) was related to the athletes’ mental toughness ($R^2 = .56$); the ego goal orientation pathway was not significant ($\beta = .04$). These results speak to the potential positive
influence of parents and coaches on athletes’ mental toughness through their endorsement of task-involving messages and pursuits leading to the development of a task goal orientation.
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CHAPTER 1
INTRODUCTION

Mental toughness is a term often used in popular sport culture, particularly in reference to athletic performances. Athletes who consistently perform at a high level may be described as being mentally tough, whereas athletes who choke under pressure or do not live up to expectations are perceived as lacking mental toughness. As mental toughness research has progressed beyond defining and measuring it (Crust, 2008; Crust & Clough, 2011), researchers have noted the importance of identifying the mechanisms through which mental toughness develops (Connaughton, Hanton, & Jones, 2010; Gucciardi, Gordon, Dimmock, & Mallet, 2009b; Connaughton, Thelwell, & Hanton, 2011). Even with these advances, there has not been a universally agreed-upon theoretical framework to guide research in this area (Gucciardi & Gordon, 2011).

Achievement goal theory (Ames, 1992; Nicholls, 1984), which refers to the differential beliefs about success, intelligence, failure, effort, and ability that influence the goals individuals set in achievement contexts, has been used extensively to understand different aspects of athletes’ psychological development, such as self-esteem (Kavussanu & Harnisch, 2000), perceived sport competence (Duda & Hall, 2001), and intrinsic motivation (Cury, Defonseca, Rufo, & Sarrazin, 2002). Throughout their participation in sport, athletes receive messages from significant others (e.g., parents, coaches, and teammates) about performance, ability, and success, and these messages over time become internalized to form a conceptual framework from which athletes understand and approach achievement related contexts in sport. Given its conceptual similarity to mental toughness and its emphasis on the influence of motivational climates on athletes’ development (Roberts et al., 2007), achievement motivation theory offers a
framework from which to organize and study the psychosocial factors that may underlie the development of mental toughness.

Mental Toughness

Mentally tough athletes are thought to be able to handle criticism, loses, and poor performances (Clough, Earle, & Sewell, 2002), overcome or rebound from setbacks (Jones et al., 2002), and remain calm and relaxed in high pressure situations (Clough et al., 2002). These behaviors are thought to occur in mentally tough athletes due to their possessing high levels of confidence (Bull, Shambrook, James, & Brooks, 2005), emotional and attentional control (Jones et al., 2002), and consistency of attitude, motivation, and effort (Middleton, Marsh, Martin, Richards, & Perry, 2004). However, some researchers (Connaughton & Hanton, 2009; Crust, 2008) have identified a host of issues regarding proposed definitions and conceptualizations of the construct, including defining the construct in absolute terms (e.g., always perform well under pressure) or according to what it allows a person to do rather than what it is (see Jones et al.’s, 2002 definition), as well as assuming that elite athletes are mentally tough and therefore using small sample sizes with only elite athletes as participants. These limitations have created difficulty not only in understanding mental toughness objectively, but also in identifying the factors contributing to its development.

A recent definition of mental toughness may address these inconsistencies. Based on a personal construct psychology (PCP; Kelly, 1991) theoretical framework, Gucciardi, Gordon, and Dimmock (2009) proposed that “Mental toughness is the presence of some or the entire collection of experientially developed and inherent values, attitudes, emotions, cognitions, and behaviors that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressures, challenges, and adversities to consistently
achieve his or her goals” (p. 67). Although broad, this definition appears to address a number of the criticisms that have been made previously regarding the scope of mental toughness definitions and conceptualizing it as more than just positive attributes (Crust, 2008), and is in line with a conceptualization of mental toughness based on Mischel and Shoda’s Cognitive-Affective Processing System (CAPS; Mischel & Shoda, 1995) proposed by Harmison (2011). Both Gucciardi et al.’s (2009) and Harmison’s (2011) conceptualizations speak to the importance of viewing mental toughness as an expression of the interaction between situational variables and athletes’ beliefs, goals, affects, encodings, and self-regulation skills rather than a collection of specific attributes.

**Achievement Goal Theory and Mental Toughness**

Research to date on the development of mental toughness has been largely atheoretical and has relied heavily on anecdotal, retrospective accounts of elite and superelite (e.g., Olympic and World Champion-level) athletes, coaches, and athletes’ parents (e.g., Connaughton, Hanton, & Jones, 2010; Connaughton, Wadey, Hanton, & Jones, 2008). Although these accounts represent an important starting point for studying mental toughness, incorporating an established theoretical framework will prove useful for advancing research, particularly with regards to determining how the messages and behaviors of significant others (e.g., coaches, teammates, parents) may influence the development of athletes’ mental toughness. Given the important similarities between the types of environments and relationships described in the mental toughness development literature and task oriented climates, achievement goal theory (Ames, 1992; Dweck & Leggett, 1988, Nicholls, 1984) provides a useful theoretical and empirical foundation through which to study mental toughness development.
The motivational climate refers to the attitudes, values, behaviors, and messages that are communicated by significant figures in individuals’ lives, most often their coaches, parents, and peers, which, in turn, influence athletes’ views about achievement and effort (Roberts, Treasure, & Conroy, 2007). Ames (1992), in his pioneering work on achievement goals and motivation, operationalized the motivational climate construct along two dimensions: task-involving (mastery-oriented) and ego-involving (performance-oriented). A perceived task-involving climate is characterized by a focus on personal skill improvement, giving full effort, and learning from mistakes, whereas in an ego-involving climate, interpersonal comparison, normative ability, and the demonstration of superiority over others are emphasized. Researchers have shown that a task-involving climate, as opposed to an ego-involving one, is associated with greater perceptions of physical competence (Walker, Roberts, & Harnisch, 1998), lower state anxiety (Ntoumanis & Biddle, 1999), greater intrinsic motivation (Parish & Treasure, 2003), and greater persistence and task perseverance (Sarrazin, Roberts, Cury, Biddle, & Famose, 2002). Whether determined by the messages and behaviors of parents, coaches, or peers, all subsequently developed motivational climates have been found to have significant influences on a variety of young athletes’ thoughts, feelings, and behaviors in sport (Duda & Balaguer, 2007; Ntoumanis et al., 2007; White, 2007).

According to achievement goal theory (Ames, 1992; Nicholls, 1984), over time the perceptions of how significant others (e.g., coaches, parents, teammates) view and talk about winning, improvement, competition, effort, etc. (i.e., the motivational climate) will become internalized by athletes and subsequently will have important effects on their responses to achievement situations. This internalized perspective is referred to as a goal orientation and influences the way in which individuals define success, judge their competence, and approach
performance situations (Roberts et al., 2007). Like motivational climates themselves, it also is conceptualized along task or ego dimensions. Not surprisingly, relations have been found between motivational climates initiated by coaches, parents, and/or peers and the goal orientations that are adopted by athletes over time and exposure; specifically, perceptions of a task-involving climate are associated with a task goal orientation and perceptions of an ego-involving climate with an ego goal orientation (Duda & Horn, 1993; Malete, 2006; Smith, Fry, Ethington, & Li, 2005; Waldron & Krane, 2005).

Whereas motivational climate refers to the environmental, situational factors (i.e., actions and messages of important social agents) perceived by athletes, goal orientation is considered dispositional in nature (Roberts et al., 2007). Athletes’ goal orientations serve as cognitive schema (frameworks) that influence the way in which sport and non-sport related environmental demands are interpreted and approached (Duda, 1993). A task goal orientation, for example, is characterized by a focus on skill improvement and putting forth maximum effort. Individuals who are task oriented perceive challenges as learning opportunities, and set standards for achievement that are self-referenced, long-term, and flexible (Grant & Dweck, 2003). Conversely, an ego goal orientation is characterized by a focus on showing competence by outperforming others. Individuals who hold this goal orientation set achievement standards that are other-referenced, normative, and rigid (Duda, 2001; Grant & Dweck, 2003), and may shy away from challenges so as not to hurt their self-image.

A task goal orientation, similar to a task oriented motivational climate, has been associated with a number of positive psychological, emotional, and performance outcomes in sport, such as high sport competence, self-esteem, and intrinsic motivation (Sarrazin et al., 2002; Van Yperen & Duda, 1999), whereas an ego goal orientation, similar to an ego oriented climate,
has been connected to negative outcomes in sport, such as greater state and trait anxiety, less
enjoyment, and burnout (Duda et al., 1995; Duda & Nicholls, 1992; White & Zellner, 1996).
These goal orientations are thought to develop from the motivational climates created by
important social agents (e.g., parents, coaches), and to influence the adoption of adaptive or
maladaptive achievement behaviors (Ames, 1992). From an athletic standpoint, goal orientations
provide valuable insight into athletes’ internalized frameworks for how they understand,
approach, and respond to competitive situations, such as in practices and competitions.
Consistent with the conceptualizations of mental toughness proposed by Gucciardi et al. (2009)
and Harmison (2011), task oriented athletes’ beliefs, goals, values, and affects are likely to be
adaptive and conducive to optimal performance, resulting in behaviors considered to be
indicators of mental toughness (e.g., remaining calm under pressure, regulating emotions,
maintaining motivation despite setbacks).

Mentally tough athletes are expected to perform consistently well in competition, cope
effectively with pressure, and overcome injuries, losses, and other setbacks (Jones et al., 2002;
Middleton et al., 2004; Sheard, 2010). These expectations, however, are simply behavioral
indicators and cannot comprehensively explain what separates mentally tough athletes from
mentally weak ones. Perhaps more importantly, mentally tough athletes are highly motivated,
perceive pressure, setbacks, and obstacles as challenges, are unafraid of losses or mistakes,
believe they are capable of improving with hard work, and focus on the controllables (Coulter et
al., 2010; Gucciardi et al., 2009; Harmison, 2011). These cognitions, attitudes, and beliefs
interact with situational variables and result in what could be referred to as mentally tough
behaviors (e.g., making a last-second shot, blocking out distractions, controlling anxiety and
releasing tension prior to performing).
Similarly, task oriented individuals, having internalized the task-involving messages and behaviors of significant others (parents, peers, and coaches), perceive pressure, setbacks, and obstacles as challenges, focus on skill improvement and giving full effort, and are highly motivated by self-referenced achievement goals (e.g., Horn, Duda, & Miller, 1993; Nicholls, 1992; Roberts et al., 1996; Roberts et al., 2007), which reportedly result in greater performance, persistence, enjoyment, and confidence than their ego oriented counterparts (Cury et al., 2002; Kavussanu & Harnisch, 2000; Pensgaard & Roberts, 2003; Yperen & Duda, 1999). Conversely, ego oriented athletes, as a result of viewing success as outperforming others, talent as innate, and losing as failure (Ames, 1992; Dweck, 1999; Roberts et al., 2007), may think and behave in ways that are opposite of what is expected from mentally tough athletes; namely, shying away from and experiencing high anxiety during competition where they might lose, exhibiting minimal effort, and lacking motivation and persistence (Sarrazin et al., 2002; Theeboom, De Knop, & Weiss, 1995; White & Zellner, 1996).

In one of the only studies to date assessing some of the aforementioned hypothesized relationships, Bair (2013) examined the goal orientations and mental toughness of 232 male and female collegiate student-athletes. Her results indicated that the possession of a task goal orientation, particularly in combination with a high level of perceived ability, were related strongly to overall mental toughness ($\eta^2 = .20$). In contrast, the possession of an ego goal orientation accounted for minimal variance in the athletes’ mental toughness scores ($\eta^2$ ranged from .01 to .05 for the three mental toughness subscales used in her study), and thus was thought to be a potential detriment to the development of mental toughness in athletes. Bair’s (2013) study was an important first step in understanding how the elements of achievement goal theory and mental toughness may interrelate; however, her study did not assess the influence of the
motivational climate on either goal orientation or mental toughness, and thus did fully represent achievement goal theory. In addition, the measure of mental toughness used in her study, the Mental, Emotional, and Bodily Toughness Inventory (MeBTough; Mack & Regan, 2008), assessed constructs based on Loehr’s (1994) conceptualization and definition, which focused on an athlete’s abilities to be tough mentally, emotionally, and physically. Although a valuable starting point, Loehr’s perspective speaks mainly to the characteristics of a mentally tough athlete and what mental toughness allows an athlete to do, which is not as comprehensive as the PCP perspective endorsed by Gucciardi et al. (2009) that views mental toughness as a personality construct consisting of situationally influenced attitudes, values, beliefs, cognitions, affects, and behaviors. Thus, the current study extends Bair’s (2013) research by examining more elements of achievement goal theory (i.e., motivational climates and goal orientation), including additional measures of mental toughness that are more closely aligned with contemporary definitions (Coulter et al., 2010; Gucciardi et al., 2009), and assessing the experiences of male and female high school varsity athletes.

Based on achievement goal theory (Ames, 1992; Dweck & Leggett, 1988, Nicholls, 1984), I examined the relations between perceived motivational climate (parent, peer, and coach created), goal orientations, and mental toughness. In my study, I included two models that represented direct and mediated effects. In Model 1 (see Figure 1), Task and Ego Goal Orientations were hypothesized to fully mediate the relation between Parent, Coach, and Peer Motivational Climates (Task and Ego) and Mental Toughness. That is, I hypothesized that Parent, Peer, and Coach Task-Involving Motivational Climates would be related to a Task Goal Orientation. Similarly, Parent, Peer, and Coach Ego-Involving Motivational Climates would be associated with an Ego Goal Orientation. But, only Task Goal Orientation (positively) and Ego
Goal Orientation (inversely) would be related to Mental Toughness. In this model, the effects of the motivational climates on mental toughness would be indirect. In Model 2, which included all the paths from Model 1, I examined whether the direct paths from the motivational climates would be related not only directly to goal orientation, but also to mental toughness.
CHAPTER 2

METHOD

Participants

Participants were 599 varsity athletes (boys = 309; girls = 290) drawn from the six high schools that comprised a local school district in the South Central U.S. Mean ages for girls and boys, respectively, were 15.90 years ($SD = 1.04$) and 16.46 years ($SD = 0.98$). For race/ethnicity, the majority of the athletes were White/NonHispanic ($n = 372, 62.1\%$), followed by Black/NonHispanic ($n = 55, 9.2\%$), Asian American ($n = 39, 6.5\%$), and Hispanic ($n = 92, 15.4\%$); 21 (3.5\%) indicated “other” and 11 (1.8\%) did not provide their race/ethnicity. The athletes were mostly juniors ($n = 231, 38.6\%$), followed by sophomores ($n = 187, 31.2\%$), freshmen ($n = 107, 17.9\%$), and seniors ($n = 70, 11.7\%$). They participated in all 13 different sports that were offered at the high school, including: baseball, basketball, cross country, diving, football, golf, soccer, softball, swimming, tennis, track and field, volleyball, and wrestling. See Table 1 for the students’ race/ethnicities, grade in school, and sports played presented by gender.

Measures

Parent Motivational Climate

The 18-item Parent-Initiated Motivational Climate Questionnaire (PIMCQ-2; White & Duda, 1993; White, Duda, & Hart, 1992) assesses participants’ perceptions of the motivational climate created by their parent(s) (or other primary caregivers) across three subscales: Worry-Conducive Climate (5 items; parents’ reactions to mistakes, failure, and not performing as well as others; e.g., “In my main sport, I believe that my parent(s) or primary caregiver makes me feel badly when I can’t do as well as others”), Success Without Effort (4 items; parents’ perceived emphasis on achieving while demonstrating the least amount of effort; e.g., “In my main sport, I
believe that my parent(s) or primary caregiver says it is important for me to win without trying hard”), and Learning and Enjoyment (9 items; parents’ expressed satisfaction at improvement and learning from mistakes; e.g., “In my main sport, I believe that my parent(s) or primary caregiver encourages me to enjoy learning new skills”). The athletes indicated their agreement using a 5-point scale that ranged from 1, strongly disagree, to 5, strongly agree. Mean scores are calculated for each factor; higher scores represent a stronger endorsement of that type of climate. The Worry-Conducive Climate and Success Without Effort factors represented an ego-oriented climate, whereas the Learning and Enjoyment factor represented a task-oriented climate.

Cronbach’s alphas in a sample of 204 adolescent female volleyball players were: .91 (Worry-Conducive Climate), .87 (Success Without Effort), and .89 (Learning and Enjoyment; White, 1996); alphas in the current study were .61 to .70 (Learning and Enjoyment), .89 (Worry-Conducive Climate), and .78 to .79 (Success Without Effort). Principal components analysis supported the three domains, which accounted for 51.4% of the response variance (White, 1996). Correlations between the Learning and Enjoyment subscale and a task orientation (r = .41) as well as the Success Without Effort subscale and an ego orientation (r = .30; White et al., 1992) provide support for the criterion validity of the measure.

Coach Created Motivational Climate

The 33-item Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, Duda, & Yin, 2000) assesses perceptions of the coach-created motivational climate along six subscales: Effort/Improvement (8 items; emphasizing skill mastery and giving full effort; e.g., “On this team, trying hard is rewarded”), important role (5 items; reinforcing each athlete as a valuable member of the team; e.g., “On this team, each player contributes in some important way”), Cooperative Learning (4 items; emphasizing growth and improvement through
intra-team member support, encouragement, and instruction; e.g., “On this team, players help each other learn”), Intra-team Member Rivalry (3 items; promoting high levels of competition between team members; e.g., “On this team, players are encouraged to outplay the other players”), Unequal Recognition (7 items; primarily recognizing and reinforcing the better players; e.g., “On this team, the coach has his or her own favorites”), and Punishment for Mistakes (6 items; chastising or otherwise reprimanding after an error; e.g., “On this team, players are taken out of a game for mistakes”). The six dimensions loaded on two higher-order factors reflecting two distinct motivational climates: task (cooperative learning, effort/improvement, important role) and ego (intra-team member rivalry, unequal recognition, punishment for mistakes). For each item, athletes rated their agreement from 1, strongly disagree, to 5, strongly agree. Total score for each dimension is the mean; higher scores indicate a stronger perception of that dimension (e.g., that the coach punishes mistakes). In a sample of female adolescent volleyball players (Newton et al., 2000), Cronbach’s alphas were .74 (Cooperative Learning), .79 (Important Role), .77 (Effort/Improvement), .86 (Unequal Recognition), .82 (Punishment for Mistakes), and .54 (Intra-team Member Rivalry); alphas from the current study were .79 to .81 (Cooperative Learning), .80 to .85 (Important Role), .77 to .80 (Effort/Improvement), .85 to .88 (Unequal Recognition), .78 to .80 (Punishment for Mistakes), and .56 to .60 (Intra-team Member Rivalry). Confirmatory factor analysis revealed that the subscales loaded onto the higher order factors as expected (Newton et al., 2000). Further, Newton et al. (2000) reported that team satisfaction and effort, respectively, were related inversely to the higher order factor of Ego-involving Climate ($r = -.31, -.12$), and positively with the higher order factor of Task-involving Climate ($r = .52, .25$).
Peer-Created Motivational Climate

The 21-item Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ; Ntoumanis & Vazou, 2005) assesses perceptions of the climate as created by teammates. Over the course of three separate studies, Ntoumanis and Vazou found support for a five factor structure: Improvement (4 items: providing feedback and encouraging teammates to progress and develop; e.g., “On this team, most athletes help each other improve”), Relatedness Support (3 items; fostering feelings of inclusion, friendship, and a positive team atmosphere; e.g., “On this team, most athletes make their teammates feel valued”), Effort (5 items; degree to which teammates emphasize giving full exertion; e.g., “On this team, most athletes praise their teammates who try hard”); Intra-team Competition/Ability (5 items; team members’ promotion of competition, showing greater skill, and being better than one’s teammates; e.g., “On this team, most athletes want to be with the most able teammates”), and Intra-team Conflict (4 items; existence of unsupportive, criticizing, or otherwise negative behaviors towards other team members; e.g., “On this team, most athletes complain when the team doesn’t win”). Athletes responded to each item from 1, strongly disagree, to 7, strongly agree. Total score for each factor is the mean; higher scores indicate a stronger climate on that dimension. In a sample of male and female athletes aged 12 to 17 years, Ntoumanis & Vazou reported Cronbach’s alphas of .77 (Improvement), .73 (Relatedness Support), .70 (Effort), .69 (Intra-team Competition/Ability), and .73 (Intra-team Conflict); 4-week test-retest reliabilities ranged from .74 to .82. In the current study, Cronbach’s alphas ranged from .83 to .86 (Improvement), .72 to .73 (Relatedness Support), .85 to .85 (Effort), .64 to .71 (Intra-team Competition/Ability), and .81 to .82 (Intra-team Conflict). The factors of Improvement, Relatedness Support, and Effort loaded significantly onto a higher order Task-involving factor (focus on getting better and trying
one’s hardest, with each team member being important and respected), and the Intra-team Competition/Ability and Intra-team Conflict factors loaded onto a higher order Ego-involving factor (focus on showing dominance over teammates, competition for attention and prestige on the team). In addition, Vazou, Ntoumanis, and Duda (2006) found that the higher order Task-involving factor of the PeerMCYSQ was a significant predictor of physical self-worth and enjoyment in a sample of young (ages 12-17) male and female athletes.

Goal Orientation

The 13-item Task and Ego Orientation in Sport Questionnaire (TEOSQ, Duda, 1992; 1993) assesses goal orientation along two subscales: Task (7 items; self-referenced standards of success, developing competence and mastering skills; e.g., “I feel most successful in sport when I do my very best) and Ego (6 items; other-referenced standards of success, being better than others; e.g., “I feel most successful in sport when I’m the best”). For each item, athletes responded from 1, strongly disagree, to 5, strongly agree. Total score for each subscale is the mean; higher scores indicate a greater endorsement of that orientation. White and Duda (1994) reported Cronbach’s alphas of .77 (Task) and .87 (Ego) in a sample of male and female high school athletes; alphas from the current study ranged from .81 to .84 (Task) and .84 to .87 (Ego). The factor structure of the TEOSQ was supported through confirmatory procedures (Duda, 1993; White & Duda, 1994). Further, scores on the Task orientation dimension significantly correlated with enjoyment ($r = .21$) and effort ($r = .33$), whereas the Ego orientation dimension significantly related to pressure ($r = .21$) and negatively to enjoyment ($r = -.24$; Duda, Chi, Newton, Walling, & Catley, 1995).

The 12-item Achievement Goal Scale for Youth Sports (AGSYS; Cumming, Smith, Smoll, Standage, & Grossbard, 2008) assesses goal orientation along two subscales: Task (6
items; personal improvement, self-referenced standards of success; e.g., “My goal is to master the skills in my sport”) and Ego (6 items; being better than others, other-referenced standards of success; e.g., “To me, success means being better than others”). Athletes responded to each item from 1, *not at all true*, to 5, *very true*. Total score is the mean of each subscales’ items; higher scores indicate greater perceptions of that goal orientation. Cumming et al. (2008) reported Cronbach’s alphas of .78 (Task) and .88 (Ego) in a sample of male and female athletes aged nine to fourteen years; alphas for the current study ranged from .71 to .76 (Task) and .86 to .89 (Ego). Cumming et al. (2008) reported significant positive relations between the Task orientation subscale and task goal orientation \( r = .49 \), intrinsic motivation \( r = .65 \), and mastery motivational climate \( r = .43 \), as well as between the Ego orientation subscale and somatic anxiety \( r = .23 \), worry \( r = .18 \), and ego oriented motivational climate \( r = .41 \).

**Mental Toughness**

The 32-item Mental Toughness in Sport Questionnaire (MTSQ; Harmison, 2012) measures mental toughness along five subscales: Self-belief (6 items; believing in one’s abilities to reach goals and potential; e.g., “I believe in my ability to achieve my competition goals”), Summoning Motivation and Desire (8 items; possessing a disciplined, strong work ethic and internal determination to succeed; e.g., “When I compete I never give up due to my determination to be the best I can be”), Dealing with Adversity and Failure (6 items; controlling thoughts and feelings following mistakes, and persevering in the face of obstacles; e.g., “When I experience some failure during competition, I respond with optimism and hope”), Managing Pressure and Negative Emotions (6 items; thriving on the pressure of competition and channeling negative emotions in a positive manner; “When I compete, I often feel overly tense or worried regarding how I will perform”), and Staying Focused (6 items; ignoring distractions and
concentrating on the task at hand; e.g., “I am able to block out personal problems and prevent them from interfering with my performance”). For each item, athletes rated their agreement from 1, *strongly disagree*, to 7, *strongly agree*. Total score for each subscale is the mean; higher scores reflect greater levels of that subscale. In the current study, Cronbach’s alphas ranged from .75 to .81 (Self-belief), .82 to .83 ( Summoning Motivation and Desire), .76 to .77 (Dealing with Adversity and Failure), .59 to .68 (Managing Pressure and Negative Emotions), and .80 to .81 (Staying Focused).

The 14-item Sports Mental Toughness Questionnaire (SMTQ; Sheard et al., 2009) assesses mental toughness along the subscales of Confidence (individuals’ belief in their ability to achieve their goals and a belief that they are different from, and better than, their opponents), Constancy (individuals’ willingness to set and adhere to training and competition goals, the possession of an unyielding attitude and grit, and a determination to meet performance demands), and Control (individuals’ perception that they can bring about a desired outcome and have control over their lives and their performances). Athletes rated each item, such as “I worry about performing poorly,” from 1, *not at all true*, to 4, *very true*. Total score is the mean; higher scores represent greater levels of overall mental toughness. In a sample of 92 male varsity collegiate football players, Petrie, Dieters, and Harmison (2014) reported a Cronbach’s alpha of .72 for the total score. Alphas for the SMTQ total score for this study ranged from .74 to .75. Sheard et al. (2009) provided support for the divergent validity of the measure through correlations between the SMTQ and conceptually related but theoretically distinct scales, including hardiness (*rs* = .14-.33; Maddi & Khoshaba, 2001), optimism (*rs* = .23-.38; Scheier, Carver, & Bridges, 1994), and affect (*rs* = .12-.49; Watson, Clark, & Tellegen, 1988).
Procedure

Following approval from the Institutional Review Board for Human Subjects Research, the high school district’s athletic director (AD) was contacted to obtain permission for the athletes within his school district to participate. After completing a background check, the lead investigator met first with the district athletic director, and then with the athletic directors from each of the six high schools to discuss the athletes’ participation and the data collection process. The district AD determined that data collection would occur at each school during the students’ athletic periods, which were 1st period for girls and 8th period for boys for all sports. Further, the district AD required that data collection be conducted by each team’s head coach, so detailed instructions regarding the study, obtaining consent, and administering the survey packets (see Appendix A) were provided by the lead investigator.

Parental consents, as well as written student athlete assent, were obtained prior to participation. At the beginning of the athletic period, head coaches read the instructions for the study and then distributed the questionnaire packets. Athletes did not provide any identifying information (e.g., name) on the questionnaire packets and participation was voluntary. A cash donation was made to the district’s athletic department in appreciation for their support with the study. In addition, a summary of the study’s findings, specifically as they related to coaches’ influences on their athletes’ mental toughness, was emailed to the coaches at each school.

Data Analysis

Although 691 athletes initially participated, 92 packets were deemed unusable due to significant missing data and biased responding (e.g., circling all of the same number on every questionnaire); overall participation rate was 87%. The 599 usable surveys were screened for missing values using the Missing Values Analysis (MVA) module in SPSS (version 21). The
data were found to be missing completely at random and missing values represented fewer than 2% of all cases across any measure. Missing data were replaced using the expectation maximization (EM) imputation procedure (Schlomer, Bauman, & Card, 2010). Total scores were computed and data were checked for any violations of distributional normality. Skewness and kurtosis were within acceptable ranges, with the exception of the mastery orientation subscale of the AGSYS, which was found to be negatively skewed. A square root transformation of the reflected variable resulted in a slight decrease in skewness but not enough to warrant inclusion in the subsequent analyses (Tabachnick & Fidell, 2007).

In order to both test and confirm the proposed models, participants were divided into two groups using the SPSS random split-file procedure. Sample A (n = 299) was used to test the initial proposed models, whereas Sample B (n = 300) was used to validate and confirm the models. The two samples were compared across each set of measures using MANOVA procedures; no significant between-sample differences were found on any set of the measured variables (p’s > .05). The proposed models (Figures 1 & 2) were tested using structural equation modeling (SEM), a two-step statistical method of assessing the fit of multivariate, theoretically derived models to sample data (Bentler, 1980). For this study, EQS version 6.2 was used (Byrne, 2006). Because the data demonstrated multivariate normality, with the one exception of the mastery orientation subscale of the AGSYS, we used maximum likelihood (ML) as our estimation procedure (Weston & Gore, 2006).

The first step in SEM is to establish the measurement model, which was done using confirmatory factor analysis (CFA). Decisions about whether to retain measured variables on each latent variable were made based on the significance of their loadings and residuals. Given participant time constraints and a lack of alternate measures, the PIMCQ-2 Learning and
Enjoyment subscale, which represented the parent task-involving climate, was parceled using the “item-to-construct balance” technique (Little, Cunningham, Shahar, & Widaman, 2002). A total of nine latent variables (LVs) were included in the model, with each LV represented by at least two measured variables. The PeerMCYSQ subscales of Improvement, Relatedness Support, and Effort were expected to load onto the peer task-involving climate variable, whereas the PeerMCYSQ subscales of Intra-team Competition/Ability and Intra-team Conflict were expected to load onto the peer ego-involving climate variable. The parent task-involving climate was expected to be represented by the PIMCQ-2 Learning and Enjoyment parcels, whereas the PIMCQ-2 subscales of Worry-conducive Climate and Success Without Effort were expected to load onto the parent ego-involving climate latent variable. The PMCSQ-2 subscales of Effort/Improvement, Important Role, and Cooperative Learning were expected to load onto coach task-involving climate; the coach ego-involving climate variable was defined by Intra-team Rivalry, Unequal Recognition, and Punishment for Mistakes. Task goal orientation was expected to be represented by the task subscales of both the TEOSQ and the AGSYS, whereas the ego subscales of the TEOSQ and the AGSYS were expected to load on the ego goal orientation latent variable. Finally the mental toughness latent variable would be represented by the SMTQ total score and the five subscales of the MTSQ.

After establishing the measurement model, I tested the strength and significance of the proposed relationships amongst the LVs in the structural model. Both direct and indirect effects were obtained for the pathways in the model. An indirect effect implies a causal relation in which an independent variable \((A)\) generates a mediating variable \((B)\), which in turn generates a dependent variable \((C)\) (Sobel, 1990). In modeling research, the indirect effect is the product of regression estimates, \((A \times B) + (B \times C)\), within this sequence of variable effects (Hanushek &
Jackson, 1977). I used the two-index approach suggested by Hu and Bentler (1999) to assess overall model fit, which consisted of examining certain combinations of fit indices to minimize type I and type II error rates as best as possible when deciding to retain or reject a certain model. The standardized root mean square residual (SRMR), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA) were chosen because they each represented a different evaluation of the model and could be looked at in combination to make accurate judgments about fit (Hu and Bentler, 1999). Based on the sample size of this study and recommendations laid out by Hu and Bentler (1999), cut off values were set at < .90 for the CFI, > .08 for the SRMR, and > .08 for the RMSEA, meaning that values below that cutoff for the CFI and above those cutoffs for the SRMR and RMSEA were considered indicative of poor model fit. Because Model 1 was nested within Model 2, the two models were examined using a chi-square test to determine the better fitting model. See Figure 1 and 2 for the proposed pathways amongst the LVs in the models.
CHAPTER 3

RESULTS

Table 2 presents the correlations, means, and standard deviations of the measured variables across both samples. The correlations among the measured variables were all in the expected directions, with the majority of them being significant.

Measurement Model: Sample A

The LVs were allowed to correlate and values ranged from -.08 to -.57, and .05 to .78. Measured variables loaded as expected on all the LVs, with three exceptions. First, for peer ego-involving climate, the PeerMCYSQ subscales of Intra-team Competition/Ability and Intra-team Conflict showed moderate internal consistency and/or low factor loadings. Therefore, the individual items for each factor were entered into the model and 4 items (all Intra-team Conflict) were found to most adequately represent the peer ego-involving climate construct. Second, for coach ego-involving climate, the Intra-team Rivalry variable was dropped and thus the latent variable was represented by the Unequal Recognition and Punishment for Mistakes subscales. Third, for the mental toughness latent variable, the Self-belief and Managing Pressure and Negative emotions subscales demonstrated poor fit and were therefore dropped from the model. Overall, the model fit the data well (SRMR = .06; CFI = .94; RMSEA = .08, 90% CI = .07 to .09); factor loadings ranged from .57 to .94 (see Table 3).

Structural Model: Sample A

Both Model 1 (SRMR = .08; CFI = .93; RMSEA = .08, 90% CI = .07 to .09) and Model 2 (SRMR = .07; CFI = .94; RMSEA = .08, 90% CI = .07 to .09) demonstrated a good fit with the data. Because the chi-square difference test between the two models was not significant (6, \( N = 299 \)) = 17.17, the other fit indexes did not differ substantially, and only one of the six direct
pathways from the motivational climate LVs to mental toughness in Model 2 was significant (see Figure 2), I decided to proceed with the more parsimonious Model 1.

For Model 1, parent task-involving climate, ($\beta = .55; p < .05$) and coach task-involving climate ($\beta = .32; p < .05$), but not peer task-involving climate ($\beta = .05$), were associated significantly with a task goal orientation ($R^2 = .57$). Ego goal orientation ($R^2 = .32$) was explained by peer ego-involving climate ($\beta = .15; p < .05$), parent ego-involving climate ($\beta = .39; p < .05$), and coach ego-involving climate ($\beta = .16; p < .05$). Finally, only task goal orientation ($\beta = .75; p < .05$) was related to the athletes’ mental toughness ($R^2 = .56$); the ego goal orientation pathway was not significant ($\beta = .04$).

Measurement Model: Sample B

The final measurement model determined in Sample A was then tested in Sample B. The latent variables were allowed to correlate and values ranged from -.03 to -.58, and .03 to .84. The overall fit of the model was good (SRMR = .06; CFI = .95; RMSEA = .07, 90% CI = .06 to .08); factor loadings ranged from .56 to .94 (see Table 3).

Structural Model: Sample B

Model 1 was again found to fit well with the data (SRMR = .07, CFI = .95; RMSEA = .07, 90% CI = .06 to .08). As in Sample A, parent task-involving climate ($\beta = .39; p < .05$) and coach task-involving climate ($\beta = .57; p < .05$) were related significantly to the athletes’ task goal orientation ($R^2 = .72$); peer task-involving climate was not ($\beta = .00$). Parent ($\beta = .14; p < .05$), coach ($\beta = .34; p < .05$), and peer ($\beta = .17; p < .05$) Ego-involving climates were associated with the athletes’ ego goal orientation, explaining 24% of its variance. Finally, only the athletes’ task goal orientation ($\beta = .68; p < .05$) explained their level of mental toughness ($R^2 = .45$); the path from ego goal orientation was not significant ($\beta = .05$).
Indirect Effects: Samples A and B

Across Samples A and B, respectively, similar significant indirect effects emerged within Model 1. Parent task-involving climate ($\beta = .41$, 95% CI [.38, .44]; $\beta = .27$, 95% CI [.23, .31]) and coach task-involving climate ($\beta = .24$, 95% CI [.21, .27]; $\beta = .38$, 95% CI [.33, .43]) were related indirectly to mental toughness through their influence in creating a stronger task goal orientation. No other significant indirect effects were found.
Within the context of achievement goal theory (Ames, 1992; Dweck & Leggett, 1988, Nicholls, 1984), I examined the relations of motivational climates (as defined by parents, peers, and coaches) to athletes’ goal orientations and mental toughness across two proposed models. In the first model, peer, parent, and coach motivational climates (each represented by task involving and ego involving latent variables) were hypothesized to be related to the athletes’ respective goal orientations (task or ego), which in turn were expected to be associated with their mental toughness. In this model, any effects from the motivational climates were hypothesized to occur through their influence on the athletes’ goal orientations. In the second model, which included all the proposal pathways from Model 1, I hypothesized additional direct effects from the task- and ego-involving motivational climates to the athletes’ mental toughness. Although motivational climates, goal orientations, and mental toughness have been examined extensively as separate constructs, my study is the first to outline and test competing models of their relations amongst male and female athletes.

Initial tests of the models revealed that they fit the data well, though Model 1 had the better overall fit when the two models were compared directly, and five of the six direct paths from the motivational climates to mental toughness were nonsignificant. Across the two samples, and in line with past research (e.g., Malete, 2006; Roberts et al., 2007; White, 1998), parent and coach task-involving motivational climates were related positively to the athletes’ task goal orientation, explaining 57% to 72% of the variance in that variable. In a study by Smith et al. (2009), for example, the goal orientations (task and ego) of 290 male and female youth basketball players (ages 9 – 13) were assessed twice across a 12 month period to determine the
influence of naturally occurring motivational climates (task and ego) that were created by the coaches of their teams. Exposure to a task-involving climate was related to a significant increase in the athletes’ endorsement of a task goal orientation and a significant decrease in the presence of an ego goal orientation from Time 1 to Time 2. Similarly, a parent created task-involving motivational climate was shown to be a positive predictor of female adolescent softball players’ task goal orientation at the end of a competitive season (Waldron & Krane, 2005). These results speak to the influence of parents and coaches on athletes’ values and goals in sport. Specifically, when parents and coaches emphasize the importance of hard work, giving one’s best effort, learning from mistakes, and using self-referenced standards of success, athletes internalize these messages over time and integrate them into their self-concept and approach to sport. In other words, when athletes are immersed in such environments, they are likely to adopt an internal and task-focused orientation that prioritizes self-referenced, flexible goals in sport, and that serves as a motivating framework from which success and competence are defined.

Unexpectedly, the endorsement of a peer task-involving climate was not associated significantly with the athletes’ task goal orientation when considered in the larger model. Although research assessing the influence of peer created motivational climates is still in its infancy, available studies suggest that certain peer messages and behaviors are related to the expression of a task goal orientation. For example, Smith, Balaguer, and Duda (2006) found that athletes aged 9 to 12 years who perceived the motivational climate created by peers to be more task-involving than ego-involving also had task-focused goal orientations. Similar results have been found in other studies (Atkins, Johnson, Force & Petrie, 2013; Boyce, Gano-Overway, & Campbell, 2009), and thus make the results of the current study inconsistent with these past findings. However, an examination of the bivariate correlations between peer, parent, and coach
task-involving climates and task goal orientation measures reveals a potential explanation for these findings. Specifically, across both samples, the subscales assessing a peer created task-involving climate had small, yet significant, positive correlations with the two subscales assessing task goal orientation (see Table 2), but moderate to large correlations with the measures of coach task-involving climates, which is consistent with past research (e.g., Vazou et al., 2006). These relations suggest a level of conceptual overlap in how the athletes experienced the messages from peers and coaches and thus the climates that they experienced within their teams. Therefore, when the climates were considered simultaneously in the model in relation to the athletes’ task goal orientation, the effects of the peer climate were attenuated, leaving the pathway from the peer motivational climate to task goal orientation nonsignificant. In future studies, researchers may want to examine how closely peer and coach-developed climates relate and determine their respective influence on each other, athletes’ goal orientations, and other psychological and behavioral (e.g., performance) outcomes.

Regarding the three ego-involving climates, all were significantly related to the athletes’ ego goal-orientation as hypothesized, and accounted for 24% to 32% of the variance in that variable. Previous studies have reported results consistent with mine for parent (White, 1996), coach (Smith et al., 2009), and peer (Carr & Weigand, 2001) ego-involving climates and their relations to athletes’ ego goal orientations. For example, in Smith et al.’s (2009) study with male and female youth basketball players aged 9 to 13 years, coach-initiated ego motivational climate scores were associated with significant increases in the athletes’ ego goal orientation scores the span of their competitive season. Further, a significant positive relationship between peer created ego-involving climate and ego goal orientation was found amongst 266 male and female middle school physical education students (Carr & Weigand, 2001). Thus, for adolescent athletes, when
coaches, parents, and peers emphasize winning over skill mastery and effort, beating others over self-improvement, the best athletes deserving the most attention, and mistakes needing to be avoided at all costs, they are likely to endorse an ego goal orientation in relation to their sports.

As hypothesized, the athletes’ task goal orientation related significantly and positively to their mental toughness, accounting for 46% to 56% of its variance. This finding is not surprising when mental toughness is viewed as a framework through which athletes experience different thoughts, feelings, behaviors, and outcomes in sport. Harmison (2011) proposed that mental toughness is less a collection of positive psychological characteristics and more a schema through which athletes view sport and make sense of their experiences. Behaviors that would be considered mentally tough (e.g., performing well under pressure, overcoming an injury, blocking out distractions) are thought to come less from athletes having a certain amount of confidence or concentration, and more from the manner in which they perceive and interpret achievement, pressure, setbacks, winning, and competition. From this perspective, a task goal orientation – self-referenced standards of success, exerting maximum effort, and perceiving adversity as a challenge to overcome and learn from – would be an essential precursor to being mentally tough.

Historically, coaches, fans, media, and even athletes’ evaluations of “mental toughness” were based on what was observed – the athletes’ behaviors. But now, researchers are suggesting that it is the underlying cognitive and affective mechanisms that influence how athletes behave during various sport situations that determine their mental toughness (e.g., Gucciardi et al, 2009, Harmison, 2011). Athletes’ perceptions of competitive situations will depend on a variety of factors, including their goal orientations, and it is these perceptions along with subsequent goal-related pursuits that determine whether or not they are seen as a mentally tough competitor.
Although previous research has established inverse relationships between an ego goal orientation and positive psychological variables in sport, including less enjoyment (Duda & Nicholls, 1992), greater concentration disruption (Newton & Duda, 1992), higher levels of state and trait anxiety (White & Zellner, 1996), and less intrinsic motivation (Duda et al., 1995), there was no significant association between this goal orientation and mental toughness across both samples. In a recent study of 232 male and female collegiate varsity student-athletes, Bair (2013) also found that task, but not ego, goal orientation was associated significantly and positively to mental toughness, and suggested that an ego goal orientation differentially impacts athletes’ mental toughness based on their perceived levels of autonomous motivation and sport competence (Bair, 2013). Thus, as competition levels increase, athletes who frequently compare themselves to others (i.e., because they have an ego goal orientation) may experience a pause in their mental toughness development because they are no longer the best athletes and do not get the same amount of praise and reinforcement from external sources or victories in competitions with others. Adherence to a task-focused framework, however, ensures that even as competition levels increase, athletes are able to see improvements in skill and maintain high levels of motivation through self-referenced standards of success. Thus, the results of my, and Bair’s (2013), study demonstrate the relative importance of a task goal orientation, compared to an ego goal orientation, for mental toughness in high school and collegiate athletes. Due to the other-referenced goals and standards for success, an ego orientation may not be consistent with a mentally tough mindset or mentally tough behaviors, at least at these competitive levels. However, a task goal orientation, defined by self-referenced standards of success and motivation, consistently has been shown to be an important contributor to various positive outcomes in sport
(Cury et al., 2002; Duda & Hall, 2003; Pensgaard & Roberts, 2003), which now can include mental toughness as demonstrated by my findings.

One purpose of this study was to determine whether motivational climates related to mental toughness directly, or whether their effects were indirect through their influence on athletes’ goal orientations. My results indicate that motivational climates’ effects are indirect, specifically through the extent to which they foster a particular type of goal orientation. In other words, previous studies (Connaughton et al., 2011; Gucciardi et al., 2009; Weiss et al., 2009), which hypothesized that creating a task-involving climate was important for developing mental toughness, now have empirical support. My results suggest a plausible mechanism for the effects of sport environments on athletes’ mental toughness. Athletes’ goal orientations, specifically task-focused, relate directly to their mental toughness, but their goal orientations are determined through the motivational climates in which they are immersed. Additional research is needed to verify these relations over time and determine the extent to which they generalize to athletes at other competitive levels (e.g., elite).

Limitations and Directions for Future Research

There are several limitations in this study that warrant discussion. First, all data were gathered through self-report, so biased or inaccurate responding is possible. However, efforts were made to ensure that only those athletes who wanted to participate were allowed and that no identifying information was requested. In addition, only measures that were considered reliable and valid, and thus accurately represented the constructs being examined were used in this study. Even so, in future studies, incorporating a third-party account (e.g., researcher, sport psychologist) of athletes’ sport environments might provide additional information to better
understand the motivational climates they experience. Further, asking coaches and peers for their perceptions of athletes’ mental toughness would allow triangulation on this important variable.

Second, the length of the questionnaire and the environment in which it was administered also may have introduced bias in the participants’ responding and represents a limit of the study. The questionnaire contained over 150 items; therefore, participant fatigue, boredom, or distractibility may have affected their responses, particularly towards the end of the survey packet. Although not ideal, the school district required that the coaches of each team be present during the survey administration, which may have created demand characteristics that affected the athletes’ responses. Although identifying information was not included on the surveys, athletes may have responded in the manner that they believed their coaches wanted, such as representing the coach or teammates in the way the coach wants versus how they actually are.

Third, this study was cross-sectional so conclusions about the temporal nature of the relationships cannot be made. Because these relations have not been studied previously, this design was appropriate (Stice, 2002). Further, the establishment of this model provides direction for future research assessing how prolonged exposure to either a task or ego oriented environment may differentially impact athletes’ mental toughness through the establishment of particular goal orientations. Previous research (e.g., Smith et al., 2007) has demonstrated that mastery approaches to coaching can result in athletes developing higher levels of a task goal-orientation. Thus, it would be interesting to test whether athletes’ mental toughness can be similarly improved (increased) via immersion in a task oriented climate. For example, using a program like the Smith et al.’s (2009) mastery approach to coaching, coaches and parents could be trained in how to create task-oriented climates and then their athletes followed over the course
of a season to determine how levels of mental toughness change and if such changes are greater than might be found in athletes whose parents and coaches did not undergo such training.

Fourth, the results of the study were based on a sample of high school varsity athletes located in the southern United States and therefore generalizability is limited. The strength of the relations between the variables in this study may have been different had elite level athletes or younger athletes rather than high school sports been surveyed. For example, the strength of athletes’ goal orientations is hypothesized to relate to the amount of time they have been exposed to a particular motivational climate (Roberts et al., 2007). Therefore, younger athletes who have not been involved in sport for more than a few months or years are likely to have less solidified goal orientations, and thus the current motivational climates they are experiencing may have a stronger influence on their mental toughness than their undeveloped goal orientations. On a separate note, researchers (e.g., Pensgaard & Roberts, 2002; Hodge & Petlichkoff, 2000) have suggested that the presence of a moderate to high ego goal orientation along with a high task orientation may be the ideal motivational profile for elite level athletes. Thus, the relations between ego goal orientation and mental toughness may have been significant and positive in a sample of elite athletes, though still of lesser strength than between task goal orientations and mental toughness. Future research might test my model in samples of elite athletes to determine if the strength and significance of the established pathways remain the same.

Finally, one of the mental toughness measures used in this study, the MTSQ-32, is still in development, though has a solid theoretical foundation (CAPS: Mischel & Shoda, 1999; Harmison, 2011) and has undergone a series of exploratory and confirmatory factor analyses to determine its structure. As such, the reliability and validity of the measure still is being established. However, factors from it were used in conjunction with the SMTQ, providing a
multiply determined representation of the mental toughness construct. Further, the three MTSQ-32 factors that loaded on the mental toughness LV were correlated moderately and significantly with the total score from the SMTQ, providing evidence for their validity. Additional research on the measurement of mental toughness will be important given the ubiquity of this construct in sport and the sport psychology literature.

Implications

Coaches, athletes, and sport psychologists have emphasized mental toughness as a vital component of successful athletic performance. As such, a major question is how to foster mental toughness in athletes; that is, what environments are most conducive to its development? The results of this study suggest that coaches and parents can have significant, meaningful effects on high school athletes’ mental toughness by communicating task-involving messages about success, effort, competition, winning, improvement, and achievement. For example, messages regarding the importance of improving skills over beating others, giving full effort regardless of outcome, learning from mistakes instead of avoiding them at all costs, and using self-referenced standards of success all reflect a task focus. Those messages are important because over time they are internalized by the athletes, resulting in a task-focused goal orientation, which appears to be related positively to mental toughness.

The creation and maintenance of task-involving motivational climates by coaches and parents has been discussed previously in the sport psychology literature, and the results of this study suggest that involving athletes in that type of sport environment can have a positive, albeit indirect, influence on their mental toughness. Parents can have very important, positive influences on their children’s psychological development in sport by demonstrating high levels of emotional support and encouragement, emphasizing effort and skill improvement over
winning, and helping children see that mistakes are to be learned from rather than be ashamed of and avoided at all costs. Gershgoren, Tenenbaum, Gershgoren, and Ecklund (2011) found that a single task-involving feedback statement to athletes during a penalty kick activity resulted in an increase in perceptions of a task-involving motivational climate. The results of the current study suggest that parents who do not create a task-involving climate may be throwing away an opportunity to contribute positively to their children’s psychological growth in sport.

Given the apparent impact of coaches, through the environments they create, on athletes goal orientations and ultimately their mental toughness, programs designed to foster task-related behaviors and communications amongst coaches would be ideal to implement. For example, paying equal attention to each member of the team, not punishing mistakes but helping athletes learn from them, focusing on skill development and improvement, using positive reinforcement, and helping athletes establish their own unique roles on the team are all considered ways in which coaches can create task-involving motivational climates. In a study by Smith et al. (2007), a mastery approach to coaching (MAC), which is a cognitive-behaviorally based intervention, was shown to be effective not only in increasing the perception of a task-involving climate by the athletes playing for coaches taking part in the intervention, but also in decreasing athletes’ anxiety. This intervention was a 75-minute workshop that focused on behavioral guidelines used to establish a task oriented climate, which included instruction on increasing positive reinforcement, encouraging and positive corrective instruction, and mistake-contingent encouragement, all seen as avenues for increasing positive coach-athlete interactions and reducing fear of failure. This study demonstrated that coaches can be taught how to create task-involving climates, which in turn may lead to positive psychological benefits in their athletes.
The results of this study show that parents and coaches may have positive effects on athletes’ mental toughness through the creation of task-involving environments that can ultimately result in athletes adopting a task goal orientation. Thus, parents may wish to talk with coaches prior to signing their children up for a team, to ensure that the coach or coaches emphasize task-involving pursuits and messages. If both parents and coaches provide the same messages about improvement, competition, winning, etc., then children are more likely to develop a strong, task-focused goal orientation. Specifically, both parents and coaches, in accordance with research on achievement goal theory, should emphasize that success is not based solely winning and beating others, but instead success is about improving one’s own skills, giving full effort, and learning from mistakes.

Conclusion

This study provided information regarding potential mechanisms through which mental toughness may be developed. The models tested in this study were based on achievement goal theory and mental toughness research, and the results suggest a manner through which parents and coaches may assist in the development of athletes’ mental toughness. In addition, the results of this study provide support for a new understanding of mental toughness as a social-cognitive construct consisting of reciprocally related attitudes, thoughts, beliefs, feelings, and behaviors (Gucciardi et al, 2009, Harmison, 2011), rather than simply a collection of positive characteristics. The link between a task goal orientation and mental toughness appears to be a competitive mindset that is focused on performing one’s best, giving full effort, learning from mistakes and improving upon them, and seeing adversity as a challenge to overcome. This study suggests that parents and coaches can facilitate the adoption of this mindset by creating task-involving climates from which athletes can develop in sport.
Table 1

Number and Percentage of Boys and Girls by Main Sport, Race/Ethnicity, and Year in School

<table>
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<tr>
<th>Main Sport</th>
<th>Boys</th>
<th></th>
<th>Girls</th>
<th></th>
</tr>
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<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
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<td>Baseball</td>
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<td>Basketball</td>
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<td>5.8</td>
<td>40</td>
<td>13.8</td>
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<td>Cross Country</td>
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<td>1.9</td>
<td>14</td>
<td>4.8</td>
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<tr>
<td>Football</td>
<td>76</td>
<td>24.6</td>
<td>40</td>
<td>13.8</td>
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<tr>
<td>Golf</td>
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<td>6.5</td>
<td>13</td>
<td>4.5</td>
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<td>Soccer</td>
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<td>47</td>
<td>16.2</td>
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<tr>
<td>Swimming</td>
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<td>11.0</td>
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<td>Tennis</td>
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<td>Volleyball</td>
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<td></td>
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<tr>
<td>Wrestling</td>
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<td>8.1</td>
<td>7</td>
<td>2.4</td>
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<table>
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<th></th>
<th>Girls</th>
<th></th>
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<td>%</td>
<td>n</td>
<td>%</td>
</tr>
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<td>9.0</td>
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<td>Other/Non-Hispanic</td>
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<td>Did not indicate</td>
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<td>%</td>
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<td>%</td>
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### Table 2

**Correlations, Means, and Standard Deviations for Measured Variables for Sample A (below the diagonal; n = 299) and Sample B (above the diagonal; n = 300)**

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<th>5</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
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<td>.66</td>
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<td>.72</td>
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<td>.73</td>
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<td>.49</td>
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<td>.10</td>
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<td>.19</td>
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<td>-.10</td>
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<td>.54</td>
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<td>-.20</td>
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<td>-.08</td>
<td>.58</td>
<td>.59</td>
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<td>15. PMCSQ-unequal</td>
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<td>-.33</td>
<td>-.27</td>
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<td>.25</td>
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<td>.35</td>
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<td>-.46</td>
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<td>16. PMCSQ-punish mistakes</td>
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<td>.02</td>
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<td>.28</td>
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<td>.19</td>
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<td>.14</td>
<td>.24</td>
<td>.31</td>
<td>-.08</td>
<td>.59</td>
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<tr>
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<td>.25</td>
<td>.29</td>
<td>.21</td>
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<td>-.07</td>
<td>.49</td>
<td>.31</td>
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<td>-.15</td>
<td>-.16</td>
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<td>-.03</td>
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<td>-.08</td>
<td>-.10</td>
<td>.09</td>
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<td>-.15</td>
<td>.37</td>
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<td>.15</td>
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<td>-.08</td>
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<td>.23</td>
<td>.12</td>
<td>-.11</td>
<td>-.25</td>
<td>.18</td>
<td>.18</td>
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</tbody>
</table>

**Mean**

|                  | 5.72| 5.32| 5.02| 3.05| 3.70| 3.93| 3.37| 3.90| 4.08| 2.40| 2.75| 4.30| 3.87|

**Standard Deviation**

|                  | 1.03| 1.19| 1.27| 1.92| 1.81| 1.99| 1.97| 1.63| 0.64| 0.88| 0.57| 0.19| 0.91|

**Note.** PeerMCYSQ = Peer Motivational Climate in Youth Sport Questionnaire, 1 (low) to 7 (high): effort, improvement, relatedness represent task-involving climate – item 7, 9, 16, and 20 represent ego-involving climate; Stem = In my MAIN SPORT team, most athletes… Item 7 – Make negative comments that put their teammates down, Item 9 – Criticize their teammates when they make mistakes, Item 16 – Complain when the team doesn’t win, and Item 20 – Laugh at their teammates when they make mistakes; PIMCSQ = Parent Initiated Motivational Climate Questionnaire - 2, scores range from 1 (low) to 5 (high); par1 and par2 represent task-involving climate – no effort and worry represent ego-involving climate; PMCSQ = Perceived Motivational Climate in Sport Questionnaire - 2, scores range from 1 (low) to 5 (high); TEOSQ = Task and Ego Orientation in Sport Questionnaire, scores range from 1 (low) to 5 (high); AGSYS = Achievement Goal Scale for Youth Sports, scores range from 1 (low) to 5 (high); MTSQ = Mental Toughness in Sport Questionnaire, scores range from 1 (low) to 7 (high); SMTQ = Sports Mental Toughness Questionnaire, scores range from 4 (low) to 4 (high). Correlations ≤ -.15 or ≥ .15 are significant at the .01 level.
### Table 3

**Standardized Parameter Estimates for the Measurement Model (n = 299 for Sample A and 300 for Sample B)**

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<th>Latent Variable</th>
<th>Observed Variable</th>
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<th>Sample B</th>
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<td>Standard Error</td>
<td>Factor Loadings</td>
<td>Standard Error</td>
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<td>.05</td>
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<td></td>
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<td>PMCSQ2 – effort/improvement</td>
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<td>Task Goal Orientation</td>
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<td>AGSYS – ego</td>
<td>.59</td>
<td>.05</td>
<td>.56</td>
<td>.05</td>
</tr>
<tr>
<td>Mental Toughness</td>
<td>MTSQ – summoning motivation</td>
<td>.84</td>
<td>.04</td>
<td>.82</td>
<td>.05</td>
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<td></td>
<td>MTSQ – dealing with adversity</td>
<td>.70</td>
<td>.06</td>
<td>.69</td>
<td>.06</td>
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<td></td>
<td>MTSQ – staying focused</td>
<td>.85</td>
<td>.05</td>
<td>.83</td>
<td>.05</td>
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<td></td>
<td>SMTQ – total score</td>
<td>.64</td>
<td>.02</td>
<td>.67</td>
<td>.02</td>
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</table>

**Note.** PeerMCYSQ = Peer Motivational Climate in Youth Sport Questionnaire; Stem = In my MAIN SPORT team, most athletes… Item 7 – Make negative comments that put their teammates down, Item 9 – Criticize their teammates when they make mistakes, Item 16 – Complain when the team doesn’t win, and Item 20 – Laugh at their teammates when they make mistakes; PIMCQ2 = Parent-Initiated Motivational Climate Questionnaire 2, parcel 1 and 2; PMCSQ2 = Perceived Motivational Climate in Sport Questionnaire 2; TEOSQ = Task and Ego Orientation in Sport Questionnaire; AGSYS = Achievement Goal Scale for Youth Sports; MTSQ = Mental Toughness in Sport Questionnaire; SMTQ = Sports Mental Toughness Questionnaire
**Figure 1.** Structural Model 1 with standardized parameter estimates and $R^2$ values from Sample A and Sample B.

*Note.* Numbers from Sample A = xx$^a$; Sample B = xx$^b$. Standard errors in parentheses. * $p < .05
Figure 2. Structural Model 2 with standardized parameter estimates and $R^2$ values from Sample A.
APPENDIX A

RESEARCH INSTRUCTIONS AND CONSENT FORMS
First and foremost, thank you very much for your help with this project! In this study, we want to better understand how coaches, parents, and teammates influence the development of athletes’ mental toughness and this project could not be done without your assistance.

In order to ensure that data collection complies with UNT’s Institutional Review Board’s standards, there are a few keys points to remember when administering the questionnaire survey:

1) Any student who has participated in a sport at the varsity level is eligible to participate (freshmen to seniors are all welcome). However, only those students who have turned in a signed parental consent and signed the accompanying ‘Athlete Assent Form’ are allowed to complete the survey. If a student is 18 years of age or older, they only need to complete the ‘Informed Consent Form’ to participate (they do not need parental consent). The parental consent form includes the ‘Athlete Assent Form’ and begins with “Before agreeing to your child’s participation” whereas the ‘Informed Consent Form’ for the 18-year old athletes begins “Before agreeing to participate”; please distinguish between the two when distributing them. Again, only those students who have returned completed consent forms may be given the survey to complete.

2) Participation in the survey is completely voluntary. If a student does not wish to fill out the survey, they do not have to do so. It is important that the students do feel free to participate (or not) as they desire. Similarly, if a student begins to fill out the survey but does not want to complete it, he or she must be allowed to stop and hand back in the incomplete survey.

3) Please read to the students the set of instructions (included below) prior to giving out the consent forms (Consent Instructions) and prior to administration of the survey (Survey Instructions). That will ensure that the data collection is done in a standardized format at every school for every team. Keep in mind that the survey is 11 pages long and consists of approximately 150 questions so please allow ample time (approx 30 minutes) for the athletes to complete the survey.

Again, thank you much for your help on this project. If you have any questions about the study, the data collection process, or anything else please feel free to contact me (nicholasbeck@my.unt.edu, cell # REDACTED) or my supervisor, Trent Petrie, Ph.D., (trent.petrie@unt.edu) at any time.

Take care.

Nicholas Beck
Consent Instructions

Please read the following instructions verbatim before handing out the surveys. Thank you!

Your participation in a research study is being requested by sport psychology researchers at the University of North Texas. They are interested in understanding more about high school varsity athletes’ mental toughness and perceptions of their sport environment and would like you to help them with this project. As part of the study you will be asked to fill out a questionnaire packet that will take approximately 30 minutes of your time and will be done during this athletic study period.

In order to take part in the study, consent from a parent and assent from you, the athlete, must first be given. Therefore, I am going to give you a consent form that details the study and that you will need to have signed by one of your parents and yourself and returned to me (YOU MAY WANT TO STATE THE DATE BY WHEN THE CONSENT SHOULD BE TURNED IN). If you are over the age of 18 please let me know because you can sign the consent form on your own. You will not need permission from your parents.

Participation in this study is voluntary, so if after reviewing the consent form with your parents you decide you do not want to participate, there will be no penalty for doing so. Once I have collected the consent forms from you, I will administer the surveys on (PUT IN THE DATE WHEN THAT WILL OCCUR IF YOU KNOW IT). If you have any specific questions about the study, you or your parent may contact the investigator who is listed on the consent form. He will be able to answer those questions. Your help in this study is greatly appreciated as it will help the researchers better understand high school athletes’ mental toughness.
Survey Instructions

Please read the following instructions verbatim before handing out the surveys. Thank you!

In a minute I will pass out the survey questionnaire packet that will ask you various questions about your mental toughness and how you see the sport environment in which you participate. This survey is completely anonymous so please do not put your name or student ID# anywhere on the packet. There are no right or wrong answers to the questions being asked, so please answer each question as honestly as possible. Your participation in this study is greatly appreciated.

Only those students who have either received parental consent and signed the attached assent form, or who are over 18 and signed the consent form are allowed to participate. If you have not given consent, do not fill out the survey. The survey is voluntary so if you become uncomfortable and do not wish to finish, you may stop at any time with no penalty. If you have any questions while completing the survey, please raise your hand and I will come by to answer them. When you are done, please bring your survey to me.
University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to your child’s participation in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

**Title of Study:** The Relations between Perceived Parent, Coach, and Peer Created Motivational Climates, Goal Orientations, and Mental Toughness in High School Varsity Athletes

**Investigator:** Nicholas Beck, M.S., University of North Texas (UNT) Department of Psychology. **Supervising Investigator:** Trent Petrie, Ph.D.

**Purpose of the Study:** You are being asked to allow your child to participate in a research study that involves examining children’s perceptions of the messages their coaches, parent(s), and teammates communicate about sport and achievement, and how these messages might be related to their mental toughness.

**Study Procedures:** Your child will be asked to answer questions in a survey packet that will take about 30 minutes to complete.

**Foreseeable Risks:** No foreseeable risks are involved in this study.

**Benefits to the Subjects or Others:** This study is not expected to be of any direct benefit to your child, but we hope to learn more about high school varsity athletes, particularly how they perceive themselves, and their coaches, parent(s), and teammates within the sport environment. We plan to use this information to educate coaches, parents, and other youth sport participants on the possible mechanisms through which they may be able to influence and enhance children’s mental toughness and motivation within the sport environment.

**Procedures for Maintaining Confidentiality of Research Records:** Your child’s name will not be attached to the questionnaire packet that he or she will fill out. Responses will be anonymous and the confidentiality of your child’s individual information will be maintained in any publications or presentations regarding this study. Only group results will be reported. The consent forms and questionnaires will be kept in a locked room within the Center for Sport Psychology and Performance Excellence office on the campus of the University of North Texas.

**Questions about the Study:** If you have any questions about the study, you may contact Nicholas Beck at nicholasbeck@my.unt.edu or Trent Petrie, Ph.D. at trent.petrie@unt.edu

**Review for the Protection of Participants:** This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.
Research Participants’ Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- You understand the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to allow your child to take part in this study, and your refusal to allow your child to participate or your decision to withdraw him/her from the study will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your child’s participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as the parent/guardian of a research participant and you voluntarily consent to your child’s participation in this study.
- You may receive a copy of this form by contacting either Nicholas Beck or Trent Petrie at the email addresses given above.

______________________________
Printed Name of Parent or Guardian

______________________________
Signature of Parent or Guardian   Date
Athlete Assent Form

You are being asked to be part of a research project being done by the University of North Texas Department of Psychology and the Center for Sport Psychology and Performance Excellence.

This study seeks to examine the relationships between your coaches’, parents’, and teammates’ messages to you and behaviors towards you about participating in your sport, and how you think about yourself as an athlete, your motivation, your sport ability, and the goals you want to achieve in sport.

You will be asked to answer questions regarding some of the things discussed in the sentence above. For example, you may be asked questions about your view on how supportive your teammates are or how good you feel about your ability to remain focused during competition. Answering all the questions in the survey packet will take about 30 minutes of your time.

If you decide to be part of this study, please remember you can stop participating any time you want.

I will not keep this page with the others and you will not put your name on your answer sheets. This way your privacy will be protected as your answers will remain anonymous.

I would greatly appreciate your help with this project.

If you would like to be part of this study, please sign your name below.

__________________________                                _______________
Printed Name of Athlete      Date

__________________________                                _______________
Signature of Athlete      Date

__________________________                                _______________
Signature of Student Investigator      Date
University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits, and risks of the study and how it will be conducted.

**Title of Study:** The Relations between Perceived Parent, Coach, and Peer Created Motivational Climates, Goal Orientations, and Mental Toughness in High School Varsity Athletes

**Investigator:** Nicholas Beck, M.S.__________, University of North Texas (UNT) Department of Psychology. **Supervising Investigator:** Trent Petrie, Ph.D.____.

**Purpose of the Study:** You are being asked to participate in a research study that involves examining your perceptions of the messages your coaches, parent(s), and teammates communicate about sport and achievement, and how these messages might be related to your mental toughness.

**Study Procedures:** You will be asked to answer questions in a survey packet that will take about 30 minutes to complete.

**Foreseeable Risks:** No foreseeable risks are involved in this study.

**Benefits to the Subjects or Others:** This study is not expected to be of any direct benefit to you, but we hope to learn more about high school varsity athletes, particularly how they perceive themselves, and their coaches, parent(s), and teammates within the sport environment. We plan to use this information to educate coaches, parents, and other youth sport participants on the possible mechanisms through which they may be able to influence and enhance athletes’ mental toughness and motivation within the sport environment.

**Procedures for Maintaining Confidentiality of Research Records:** Your name will not be attached to the questionnaire packet that you will fill out. Responses will be anonymous and the confidentiality of your individual information will be maintained in any publications or presentations regarding this study. Only group results will be reported. The consent forms and questionnaires will be kept in a locked room within the Center for Sport Psychology and Performance Excellence office on the campus of the University of North Texas.

**Questions about the Study:** If you have any questions about the study, you may contact Nicholas Beck at nicholasbeck@my.unt.edu or Trent Petrie, Ph.D. at trent.petrie@unt.edu

**Review for the Protection of Participants:** This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.
Research Participants’ Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- You understand the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw from the study will involve no penalty or loss of rights or benefits. The study personnel may also choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to your participation in this study.
- You may receive a copy of this form by contacting either Nicholas Beck or Trent Petrie at the email addresses given above.

______________________________
Printed Name of Athlete

______________________________    ____________
Signature of Athlete                  Date
APPENDIX B

LITERATURE REVIEW
Mental toughness is a term often used in popular sport culture, particularly in reference to athletic performance at the professional and super-elite levels. Elite, successful athletes who consistently perform at a high level are often described as being mentally tough, whereas athletes who fail to perform under pressure or live up to expectations are perceived as lacking mental toughness. However, athletes of all ages and skill levels are expected to perform at their best, and thus examinations of mental toughness within athletes only at the highest competitive levels are limiting. Because research on mental toughness has progressed and the scope of applicability has widened, attention has begun to focus on the mechanisms through which mental toughness develops. Unfortunately, current research on mental toughness development is without a universally agreed-upon, sound theoretical framework (Gucciardi & Gordon, 2011) and this study will integrate two areas of sport research to better understand the development of this construct.

A theoretical framework that has been used extensively to understand psychological development in sport is achievement goal theory (Ames, 1992; Dweck & Leggett, 1988, Nicholls, 1984), which refers to the differential beliefs about success, intelligence, failure, effort, and ability that influence the goals individuals set in achievement contexts and to the pursuit of those goals. Throughout their development, young athletes receive messages from significant others about performance, ability, and success in sport, and these messages over time become internalized to form a conceptual framework from which athletes understand and approach achievement related contexts in sport.

The purpose of this study is to explore how the messages athletes receive in the sport environment may be related to their mental toughness. Specifically, I will examine how perceived achievement messages from parents, peers, and coaches directly relate to both the goal
orientations and mental toughness of high school athletes, as well as how goal orientations are associated with mental toughness. In the following review: 1) current research on mental toughness, including its development, is examined, 2) the role of parent, peers, and coaches in influencing the adoption of goal orientations and relating to various psychological outcomes is discussed, and 3) the ways in which motivational climates (task or ego-involving) and goal orientations (task or ego) may be associated with an athlete’s mental toughness and the mentally tough behaviors exhibited in sport is detailed.

Mental Toughness

Conceptualization. In examining the perceived importance of various psychological attributes in sport, Gould, Dieffenbach, and Moffett (2002) found that 82% of the participants (i.e., athletes, coaches, and parents) in their study cited mental toughness as the most important factor for successful performance. Mentally tough athletes possess high levels of confidence (Bull, Shambrook, James, & Brooks, 2005; Thelwell, Weston, & Greenlees, 2005), emotional and attentional control (Jones, Hanton, & Connaughton, 2002; Sheard, 2010), and consistency of attitude, motivation, and effort (Bull et al., 2005; Middleton, Marsh, Martin, Richards, & Perry, 2004) that are thought to result in greater abilities to maintain an optimal mindset throughout competition (Cashmore, 2002), handle criticism, loses, and poor performances (Clough, Earle, & Sewell, 2002), overcome or rebounding from setbacks (Jones et al., 2002), and remain calm and relaxed in high pressure situations (Clough et al., 2002). Although these studies have added some clarity to the definition of the construct, a universal consensus has not yet been reached regarding the most useful and accurate conceptualization of mental toughness (Crust, 2007; 2008). Thus, attempts to understand how mental toughness develops and how it directly relates to performance have proved difficult (Connaughton & Hanton, 2009).
One criticism of the mental toughness literature has been the largely atheoretical nature in which the construct has been examined (Crust, 2008). To address this criticism and establish what they believed was a more comprehensive definition and conceptualization of mental toughness, Gucciardi, Gordon, and Dimmock (2009) proposed an examination from a personal construct psychology (PCP; Kelly, 1991) framework, which focuses on understanding how a person’s perceptions impact expectations of others and the world, and how these anticipations dictate his or her behavior. Gucciardi and colleagues (Coulter, Mallet, & Gucciardi, 2010; Gucciardi, Gordon, & Dimmock, 2008) used an interview protocol structured by the basic tenets of PCP to identify key mental toughness characteristics. Examples of these tenets include the fundamental postulate (people’s efforts to anticipate and make sense of their world determine their experiences, cognitions, emotions, and behaviors), individuality corollary (people differ in their perception and construction of experiences and events), and organization corollary (in their attempt to make sense of the world, people develop a hierarchical system of constructs that are given varying degrees of importance; for a review of PCP and its tenets, see Walker & Winter, 2007). Their analyses resulted in the following definition: “Mental toughness is the presence of some or the entire collection of experientially developed and inherent values, attitudes, emotions, cognitions, and behaviors that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressures, challenges, and adversities to consistently achieve his or her goals” (Coulter et al., 2010 p. 715).

Although broad, this definition appears to address a number of the criticisms that have been made about previous ones (e.g., Jones et al., 2002; Middleton, Marsh, Martin, Richards, & Perry, 2004). First, it addresses both genetic and environmental factors (“experientially developed and inherent”) as contributors to individuals’ levels of mental toughness. Second, it
acknowledges the multidimensional nature of the construct. Specifically, mental toughness consists of more than simply performing well under pressure (behavior) or thinking you are more skilled than your opponent (cognition); rather mental toughness encompasses various aspects of an athlete’s experience including his or her “values, attitudes,… and behaviors.” Finally, Coulter et al.’s (2010) definition highlights mental toughness’s importance in achieving goals, a departure from previous definitions and conceptualizations that have emphasized being “better than your opponent” (Jones et al., 2002) and/or winning every time (Andersen, 2011) as key aspects. Although athletes at high levels of competition set winning as a top priority (and understandably so), training goals and personal performance goals also are important, and losing does not inherently mean that an individual is not mentally tough. Indeed, based on their conceptualization of mental toughness from a PCP perspective, how athletes anticipate, react to, interpret, and learn from a win or loss is more indicative of their level of mental toughness than the actual outcome of the competition (Gucciardi et al., 2009).

Harmison (2011) also proposed an alternative conceptualization of mental toughness, basing it on Mischel and Shoda’s Cognitive-Affective Processing System (CAPS; Mischel & Shoda, 1995), which is a social-cognitive view of personality focusing on the interaction between intrapersonal and situational factors. Detailing all aspects of the CAPS framework and how they contribute to our understanding of mental toughness is beyond the scope of this paper; however, there are a few key points to consider. From Harmison’s perspective, what we see from athletes and characterize as mental toughness (or lack thereof) are behaviors resulting from interactions of personality and situational variables. The interactions of these variables are complex and multidimensional, but the behaviors that result from them, and suggest athletes’ mental toughness, would be present across a variety of contexts. For example, a point guard who
consistently displays confidence and good performances (i.e., is relaxed, makes good decisions, and takes high percentage shot attempts) under a variety of competitive situations (i.e., playing with a lead, coming from behind, away game) would be considered to have a psychological profile through which various athletic events, pressures, etc., are interpreted positively and performance enhancing cognitions, affects, and skills are activated; in other words, mental toughness.

From Harmison’s (2011) CAPS perspective, it is the interaction of five main cognitive-affective components (encodings, expectancies and beliefs, affects, goals and values, and self-regulation skills) that leads to the display of certain behaviors. These components are dynamic and interactive, and represent the personality structure of individuals (Mischel & Shoda, 1999). Briefly, encodings refer to the selective attention and interpretation that is given to certain situational variables, expectancies and beliefs are the lenses through which people understand themselves and the world, affects refer to the psychological and physiological feelings people experience in response to external stimuli, goals and values refer to the types and importance of various outcomes (goals) individuals set, and lastly, self-regulation skills are the ways in which individuals manage and control their internal states and behavior. Each of these components interacts with each other and the environment, resulting in infinitely varied situational outcomes. In a sport context for example, the same situation (e.g., last second free-throw to tie up the game) may be perceived, conceptualized, and responded to in a very different manner by two different athletes. One athlete may believe that he has put in plenty of practice and is skilled enough to make the shot, is able to relax his nerves by taking deep breaths, and feels calm and composed, whereas another athlete may be attending to the crowd instead of focusing on the rim, believes that if he does not make the shot he will be seen as a failure, and is unable to control the tension
and anxiety that he is experiencing. The former athlete could be characterized as mentally tough and would be expected to make the shot, whereas the latter athlete would not be considered mentally tough and would be expected to miss the shot.

Viewing mental toughness as the relative amount of certain attributes (e.g., confidence, consistency) someone possesses provides a limited understanding of the construct, particularly in understanding responses to the wide range of situations to which athletes are exposed in sport. Viewing behaviors as expressions of the interaction between situational variables and athletes’ beliefs, goals, affects, encodings, and self-regulation skills appears to provide a more comprehensive explanation of sport performance than simply the level of confidence or resilience athletes’ possess (Harmison, 2011). In sum, this conceptualization provides an important addition to established research as it theoretically illuminates underlying mechanisms (i.e., the 5 cognitive-affective personality components) from which mentally tough (or mentally weak) behaviors occur.

A variety of critiques have been made about mental toughness as a construct (see Andersen, 2011; Gucciardi & Gordon, 2011 for reviews); specifically, criticisms abound regarding both the absolute and vague language that has been used to describe mental toughness, the seemingly infinite number of positive characteristics associated with it, the widely varied measures created to measure it, and the lack of empirically sound research relating it directly to sport performance. Many flaws do exist in our current understanding of mental toughness, but researchers (e.g., Gucciardi et al., 2009; Harmison, 2011), by integrating established theoretical frameworks (e.g., PCP and CAPS) with mental toughness research, are advancing the field in valuable ways and reducing some of the ambiguity of the construct. Specifically, Gucciardi et
al.’s (2009) and Harmison’s (2011) conceptualizations appear to provide solid theoretical frameworks from which other areas of mental toughness research can be conducted.

**Development.** As is the case with the definition and attributes of mental toughness, how mental toughness develops has been a subject of considerable debate (Crust, 2007). Although research on this topic still is in its infancy, the majority of studies to date have demonstrated that both environmental and inherited (genetic) factors contribute (Crust & Clough, 2011; Horsburgh, Schermer, Veselka, & Vernon, 2009; Sheard, 2010). Given that mental toughness is viewed as a construct that can be affected by external factors, various studies (e.g., Bull et al., 2005; Coulter et al., 2010; Thelwell et al., 2010) have focused on identifying the potential influences.

Research to date suggests that coaches, parents, and teammates play important roles in the development of mental toughness (e.g., Connaughton, Hanton, & Jones, 2010; Gucciardi, Gordon, Dimmock, & Mallet, 2009; Connaughton, Thelwell, & Hanton, 2011). Coaches, especially, have been studied to determine the ways in which their words and actions impact athletes and help foster (or hinder) mental toughness development. For example, based on interviews with 11 elite Australian football coaches, Gucciardi et al. (2009) detailed 5 broad coaching concepts thought to influence mental toughness development in athletes. The coaches in their study reported ways in which the coach-athlete relationship, coaching philosophy, training environment, and specific coaching strategies could be used to enhance mental toughness, while also describing negative influences and experiences that may hinder development. In terms of coaching philosophy for example, many of the coaches reported that athletic and personal development of the athletes should be given priority over coaching success and that there should be a “focus on helping players learn from their failures so they can do it differently in the future” (Gucciardi et al., 2009, p 1490). A training environment where hard
work was encouraged and expected was also deemed important. The participants in Gucciardi et al.’s (2009) study reported that the 5 coaching concepts helped foster attributes associated with mental toughness such as: a high level of confidence through positive reinforcement and encouragement, resilience through an emphasis on improvement and pushing through challenging training environments, and self-motivation through coaches encouraging autonomy and open discussion of goals. Additionally, a few coach behaviors thought to hinder the development of mental toughness were discussed. These included coaches over-emphasizing players’ weaknesses, imposing unrealistic expectations, and prioritizing winning over individual player development (Gucciardi et al., 2009). Essentially, these findings and others (see Connaughton et al., 2011; Mallett & Coulter, 2011 for reviews), speak to the importance of coaches creating a “positive” atmosphere and training environment for their athletes in order to foster the development of mental toughness.

Similarly, parents are thought to be important contributors to mental toughness development. Several qualitative studies on parental influences (e.g., Bull et al., 2005; Connaughton, Wadey, Hanton, & Jones, 2008; Gucciardi et al., 2009; Thelwell et al., 2010) have discussed the importance of modeling and teaching a strong work-ethic, providing emotional and tangible support, and establishing a home environment that promotes learning. Participants in Connaughton et al.’s (2008) study emphasized the value of their parents not being over-involved or “pushy”, but being supportive and allowing for autonomy, as contributing to the development of confidence and self-responsibility at an early age. Additionally, parental focus on enjoyment and individual improvement was cited as an important contributor to developing “a burning desire and intrinsic motives for success.” (Connaughton et al., 2008, p 87). Thus the coach and parental influences on mental toughness development appear similar in a number of respects.
Most notably, encouraging hard work, skill improvement, and continuous learning, as well as providing positive feedback and support, are considered effective ways of promoting the development of those attributes associated with mental toughness.

Although peer relationships have been associated with various psychological outcomes in sport (e.g., enjoyment, continued participation; Smith, 2007; Ntoumanis, Vazou & Duda, 2007), compared to coaches and parents, few studies have examined the role of peers in the development of mental toughness. However, two aspects of peer influence identified by elite level athletes as aiding in mental toughness development, particular athletes’ determination and motivation to succeed, were support and guidance from sport peers (Connaughton et al., 2010; Thelwell et al., 2010). Specifically, watching better athletes perform skills successfully was identified as not only helping athletes improve technically, but also gain confidence in their performances and motivation to improve their skills. Additionally, emotional support from peers was discussed as enhancing confidence, persistence, and motivation, and teammates who provided competitive yet encouraging rivalries were viewed as contributors to mental toughness development (Connaughton et al., 2010). In sum, the scant research on peer influence suggests that teammates and other sport peers, similar to parents and coaches, may influence athletes’ mental toughness development, particularly through support, encouragement, guidance, and modeling.

Although only recently becoming a focus of research, a few key findings have emerged regarding mental toughness development, specifically in relation to the influences of parents, coaches, and peers. One important factor that has emerged is a high degree of emotional support given to athletes by significant others, particularly in the form of encouragement, positive feedback, and expressing belief in the athletes’ ability to succeed (Connaughton et al., 2010;
Connaughton et al., 2011; Thelwell et al., 2010). Creating an environment that encourages skill mastery, hard work, self-responsibility, enjoyment, and “healthy competition” was also identified as a key component of mental toughness development (Gucciardi et al., 2009; Mallett & Coulter, 2011). However, there still appears to be some ambiguity as to what specifically coaches, parents, and peers can do to provide the support and create the type of environment discussed as being conducive to developing mental toughness. Additionally, it is not clear how certain types of environments actually contribute to the increased confidence, motivation, consistency, and persistence they are cited as fostering. Taking a social-cognitive perspective of mental toughness (Harmison, 2011), it may be that parent, peer, and coach influences help positively shape athletes’ goals, cognitions, and encodings as they develop in sport, leading to more adaptive and performance-enhancing responses to various achievement situations rather than simply increasing athletes’ confidence or motivation.

Motivational Climate

Research to date on the development of mental toughness has been largely atheoretical and has relied heavily on anecdotal, retrospective accounts of elite and superelite (Olympic and World Champion-level) athletes, coaches, and athletes’ parents. Although an important starting point, incorporating an established theoretical framework may prove useful for advancing research, particularly with regards to determining the specific messages and behaviors of significant others that influence mental toughness development. Along this line of thinking, there appears to be a number of important similarities between the types of environments and relationships that researchers have described in the mental toughness development literature, and task-oriented climates detailed in the sport motivational climate literature. Thus, achievement goal theory (Ames, 1992; Dweck & Leggett, 1988, Nicholls, 1984), which explains the
differential impact of certain types of sport environments on psychological outcomes in sport, appears to provide an extensive and useful theoretical and empirical basis upon which mental toughness development may be examined.

The motivational climate refers to the attitudes, values, behaviors, and messages that are communicated by significant figures in individuals’ lives, most often their coaches, parents, and peers, and influence athletes’ views about achievement and effort (Roberts, Treasure, & Conroy, 2007). Ames (1992), in his pioneering work on achievement goals and motivation, operationalized the motivational climate construct along two dimensions: task-involving (mastery-oriented) and ego-involving (performance-oriented). A perceived task-involving climate is characterized by a focus on personal skill improvement, giving full effort, and learning from mistakes, whereas in an ego-involving climate, interpersonal comparison, normative ability, and the demonstration of superiority over others are emphasized. Comparisons have shown that a task-involving climate, as opposed to an ego-involving one, is associated with greater perceptions of physical competence, lower state anxiety, greater intrinsic motivation, lower propensity to cheat, greater persistence and task perseverance, and psychological well-being (Duda & Balaguer, 2007; Kuczka & Treasure, 2005; Ntoumanis & Biddle, 1999; Ommundsen & Roberts, 1999; Paris & Treasure, 2003; Sarrazin, Roberts, Cury, Biddle, & Famose, 2002; Walker, Roberts, & Harnisch, 1998).

These results underscore the importance of the environment in which athletes live, train, and compete, in particular, the establishment of a task-involving climate by coaches, parents, and peers. The importance of each of these influences on an athlete shifts over time, but all play significant roles in communicating achievement-related messages. Parents, for example, are generally the most prominent figures for children competing in sport at an early age and,
therefore, the messages they communicate about effort, perseverance, and winning can profoundly impact how their children approach and react when at practices and in competitions (Roberts et al., 2007). Indeed, high levels of emotional support and encouragement have been shown to relate to positive responses in sport, including overall enjoyment, continued involvement, and self-esteem (Anderson, Funk, Elliott, & Smith, 2003). Conversely, parental involvement marked by high levels of pressure (e.g., setting unrealistically high expectations, criticizing the child’s performance) is associated with negative responses and psychological outcomes (e.g., withdrawal from sport, anxiety, parent-child conflict) in children (Hellstedt, 1990; Stein, Raedeke, & Glenn, 1999). In sum, parents who emphasize effort and skill improvement over winning, are supportive and encouraging, and take an active interest in their child’s sporting experiences are conceptualized as initiating a task-involving climate, which may contribute to the experience of enjoyment and other positive outcomes.

In addition to parents, coaches play an important role in athletes’ development and experience in sport. Coaches’ words and actions contribute to the motivational climate that children experience in sport because they are the agents that provide immediate and continual feedback about training and competition. As such, there are certain coaching behaviors that have been associated with a perceived task-involving motivational climate (and positive psychological outcomes), and others that have been recognized as consistent with an ego-involving climate (and negative outcomes). For example, mistake-contingent reinforcement (encouragement given after a mistake; e.g., “It’s ok, keep working hard.”), a focus on skill improvement and technical instruction (showing proper technique or form of a skill), positive reinforcement (verbal or nonverbal reaction demonstrating appreciation and liking of a good play or behavior; e.g., “Way to go!”) and encouragement for effort (e.g., “Great effort!”), and equal attention to all members
of the team are associated with a task-involving climate and were found to lead to an increase in self-esteem and a reduction in performance anxiety in a sample of adolescent baseball players (Smith, Smoll, & Barnett, 1995). Further, Smith, Smoll, and Cumming (2007) found reductions in trait and state anxiety pre- to post-season in a sample of 10 to 14 year old male and female athletes whose coaches had undergone training in how to create a mastery-oriented environment. Conversely, perceived ego-oriented coaching behaviors (e.g., prioritizing winning over everything, making frequent intra-team athlete comparisons) were found to lead to higher levels of burnout (Gould, Udry, Tuffey, & Loehr, 1996), greater competitive state anxiety (Hall, Kerr, & Matthews, 1998), and decreased self-esteem (Gotwals, Dunn, & Wayment, 2003). Similar to parents, the motivational climate that coaches create can play a significant role in how athletes understand, interpret, and respond to their sporting experiences.

Although parents and coaches have been the focus in most studies on motivational climates in sport, peers’ influence have been examined recently (e.g., Carr, Weigand, & Hussey, 1999; Ullrich-French & Smith, 2006; Vazou et al., 2006). In a qualitative study, male and female athletes aged 12 to 16 years were interviewed to better understand the nature of the peer-created motivational climate (Vazou, Ntoumanis, & Duda, 2005). What emerged were eleven dimensions that were defined as either task-involving (cooperation, equal treatment, relatedness support, and effort), ego-involving (intra-team competition, normative ability, and intra-team conflict), or both, depending on the context (mistakes, autonomy support, and evaluation of competence). In other words, teammates that are encouraging and supportive, make all members of the team feel important, emphasize inter- versus intra-team competition, and establish a sense of acceptance, friendship, and belonging may contribute to the presence of a task-involving, as opposed to an ego-involving, climate.
Whether or not individuals believe the peer-created climate of their team is task-involving or ego-involving has important implications for various psychological and performance outcomes. Ntoumanis et al. (2007), reviewing the existing literature on peer-created motivational climates, reported that perceptions of a task-involving climate, compared to an ego-involving one, were associated with higher levels of physical self-esteem, enjoyment, and commitment. Additionally, the athletes in Vazou et al.’s (2005) study reported that being a member of a team marked by high levels of peer acceptance and friendship (components of a task-involving climate) resulted in increased effort and motivation, as well as a reduction in performance anxiety. More broadly, perceptions of positive sport friendship quality marked by high levels of companionship (spending time and doing things together), self-esteem enhancement (engaging in communication or activity that boosts feelings of self-worth), help and guidance (instrumental assistance and support), and loyalty (commitment to each other), as well as low levels of conflict (negative behaviors, disagree, and disrespect) and betrayal (insensitivity and disloyalty) were found to relate positively to perceptions of physical competence (Horn, 2004), enjoyment (Weiss & Smith, 2002), success expectancies and attributions (Weiss & Duncan, 1992), positive affect (Smith, 2011) and commitment (Weiss & Smith, 2002).

At present, research on motivational climate has established that the messages and behaviors of parents, coaches, and peers significantly influence young athletes’ thoughts, feelings, and behaviors in sport (Duda & Balaguer, 2007; Ntoumanis et al., 2007; White, 2007). Significant others who emphasize effort and skill improvement over winning, provide support and encouragement rather than mistake-contingent punishment, foster a sense of acceptance and inclusion, and de-emphasize winning at all costs are seen as creating a task-involving climate, a
sport environment shown to relate to greater enjoyment, motivation, and confidence, as well as many other positive outcomes (Newton & Duda, 1999; Parish & Treasure, 2003; Smith et al., 2007; Walker et al., 1998). Conversely, an ego-involving climate is created when significant others emphasize being better than others, not making mistakes, intra-team rivalry, and winning at all costs, and is related to high levels of burnout, decreased self-esteem, and high levels of competitive anxiety (Gotwals et al., 2003; Gould et al., 1996; Roberts et al., 2007; Stein et al., 1999). The aforementioned links between the types of motivational climates to which athletes are exposed and various psychological and performance outcomes in sport appear similar in many respects to the hypothesized relations between environmental factors influencing mental toughness development and thus offers a perspective through which to examine this construct’s development.

Goal Orientation

According to achievement goal theory (Ames, 1992; Nicholls, 1984) perceptions of how significant others (e.g., coaches, parents, teammates) view and communicate winning, improvement, competition, effort, etc., become internalized by an athlete over time and have important implications in achievement settings. This internalized, dispositional characteristic is referred to as a goal orientation and influences the way in which individuals define success, judge their competence, and approach performance situations (Roberts et al., 2007). Competence, success, and failure are conceptualized and defined differently based on the degree to which athletes have either a mastery/task orientation or a performance/ego orientation (Nicholls, 1989; Weiss & Ferrer-Caja, 2002). Relations have been found between the perceived motivational climate (coach, parent, or peer initiated) and the goal orientation that athletes adopt; specifically, perceptions of a task-involving climate being associated with a mastery goal
orientation and perceptions of an ego-involving climate associated with a performance goal orientation (Duda & Horn, 1993; Malete, 2006; Smith, Fry, Ethington, & Li, 2005; Waldron & Krane, 2005).

Whereas motivational climate refers to the environmental, situational factors (i.e., actions and messages of important social agents) perceived by athletes, goal orientation is considered dispositional in nature. Athletes’ goal orientations serve as a cognitive schema (framework) that influences the way in which sport and non-sport related environmental demands are interpreted and approached (Duda, 1993). A mastery goal orientation, for example, is characterized by a focus on skill improvement and putting forth maximum effort. Individuals who are mastery-oriented perceive challenges as learning opportunities, and set standards for achievement that are self-referenced, long-term, and flexible (Grant & Dweck, 2003). Conversely, an ego goal orientation is characterized by a focus on showing competence by outperforming others. Individuals who hold this goal orientation may shy away from challenges so as not to hurt their self-image, and set achievement standards that are other-referenced, normative, and rigid (Duda, 2001; Grant & Dweck, 2003).

Athletes’ goal orientations have a number of important implications for how they perceive themselves, others, success, and effort, as well as the goals they set and how they attempt to achieve those goals. As such, goal orientations have been associated with numerous outcomes in sport. For example, studies by Kavussanu and Roberts (1996) and Chi (1993) using college athletes showed mastery/task orientations related positively to perceived sport competence, intrinsic motivation, and general self-efficacy. These results are in line with numerous other studies showing relations between a mastery goal orientation and sport competence (Duda & Hall, 2001), self-esteem (Kavussanu & Harnisch, 2000), satisfaction with
life (Kavussanu & Harnisch, 2000), sportspersonship (Ryska, 2003), use of effective coping strategies (Pensgaard & Roberts, 2003), and intrinsic motivation (Cury, Defonseca, Rufo, & Sarrazin, 2002). A task orientation also has been found to be inversely related to cognitive anxiety (Ommundsen & Pedersen, 1999), concerns about mistakes and parental criticism (Hall, Kerr, & Matthews, 1998), and contemplating withdrawing from sport (Newton & Duda, 1992). Conversely, an ego orientation may be related to less intrinsic motivation (Duda, Chi, Newton, Walling & Catley, 1995) and less enjoyment (Duda & Nicholls, 1992), and more state and trait anxiety (White & Zellner, 1996), greater concentration disruption (Newton & Duda, 1992), and higher levels of negative emotionality during competition (White & Zellner, 1996).

Researchers have offered a variety of explanations for the differential outcomes associated with task versus ego orientations (Ames, 1992; Nicholls, 1992; Roberts et al., 2007). First, intelligence and ability tend to be viewed as fixed by ego oriented individuals, and malleable/incremental by those high in task-orientation (Nicholls, 1989; Duda & Nicholls, 1992). For task oriented individuals, effort and ability covary such that competence in a task is expected to increase as effort is applied. Conversely, ego oriented individuals view the expenditure of effort as a sign of lower ability, since ability is fixed and a truly skilled competitor would be successful while expending minimal effort (Ames, 1992). These differing perspectives also may explain in part why task oriented athletes show higher levels of persistence and effort expenditure under a variety of achievement settings than their ego oriented counterparts (Duda & Hall, 2001). Because task oriented individuals believe in the importance of effort for success and focus on self-referenced goals, progress and competence are judged flexibly and incrementally, resulting in consistent motivation and striving for improvement (Dweck, 1999).
Second, the perceived purposes of sport that are associated with each orientation differ. A task orientation is associated with the belief that the purpose of sport is to foster mastery and cooperation, increase self-esteem, strengthen pro-social skills and values, such as cooperation and adherence to rules, and promote a healthy lifestyle (Duda, 1989; White et al., 1998; Roberts & Ommundsen, 1996). In contrast, an ego orientation is linked to the belief that sport is for gaining social status, popularity, and career mobility, while teaching superiority and deceptive tactics (Roberts et al., 1996; Roberts & Ommundsen, 1996; Duda, 1989; Duda & White, 1992). Not surprisingly, the differential beliefs about competence, success, and the purposes of sport found for ego and task oriented individuals profoundly influence the way in which sport is played and experienced.

In sum, goal orientations are conceptualized as cognitive schemas that influence achievement striving through the establishment of goals, perceptions of success and competence, and the behaviors associated with goal attainment (Duda, 1993). A mastery goal orientation, as with a task oriented motivational climate, has been associated with a number of positive psychological, emotional, and performance outcomes in sport, such as high sport competence, self-esteem, and intrinsic motivation (Sarrazin et al., 2002; Van Yperen & Duda, 1999), whereas an ego goal orientation, similar to an ego oriented climate, has been associated with negative outcomes in sport, such as greater state and trait anxiety, less enjoyment, and burnout (Duda et al., 1995; Duda & Nicholls, 1992; White & Zellner, 1996). These goal orientations are thought to develop from the motivational climates created by important social agents (e.g., parents, coaches), and to influence the adoption of adaptive or maladaptive achievement behaviors (Ames, 1992). Task oriented individuals, for example, exert effort and work towards mastery and improvement in achievement settings (Roberts, Treasure, & Kavussanu, 1997), whereas ego
oriented athletes are concerned about their ability relative to others and may adopt a maladaptive win-at-all-cost mentality (Nicholls, 1989). From an athletic standpoint, goal orientations may provide valuable insight into athletes’ internalized frameworks for how they understand, approach, and respond to competitive situations, such as in practices and competitions. Consistent with the conceptualizations of mental toughness proposed by Gucciardi et al. (2009) and Harmison (2011), task oriented athletes’ beliefs, goals, values, and affects are likely to be adaptive and conducive to optimal performance, resulting in behaviors considered indicative of mentally tough athletes (e.g., remaining calm under pressure, regulating emotions, maintaining motivation despite setbacks).

Motivational Climate, Goal Orientation, and Mental Toughness

As mentioned previously, the motivational climate and goal orientation constructs are similar in regards to how they may influence athletes’ views of and responses to achievement related situations (e.g., competitions). Goal orientation refers to the internalized achievement-related schemas from which individuals operate, whereas the motivational climate refers to the particular environments, messages, values, and behaviors regarding achievement that are created and communicated by significant others. From a theoretical standpoint, prolonged exposure to a particular type of motivational climate (task or ego), leads to the internalization of messages about achievement, success, and competition, resulting in the adoption of a task or ego goal orientation (Ames, 1992; Nicholls, 1989). Indeed, this relationship has been examined in numerous studies (e.g., Duda & Horn, 1993; Malete, 2006; Smith et al., 2005; Waldron & Krane, 2005), and findings consistently have shown a task oriented climate to be related positively to the adoption of a mastery goal orientation, and a performance oriented climate to be associated with the adoption of an ego orientation. When the social agents in an environment emphasize skill
mastery and personal progress, individuals are more likely to orient towards self-referenced goals and the intrinsic rewards of learning and improving than in contexts emphasizing being better than others.

Athletes’ goal orientations do change and develop over time, influenced by the motivational climates created by their coaches, parents, and teammates. However, once established, goal orientations are somewhat stable over time (Duda & Whitehead, 1998; Roberts, Treasure, & Balague, 1998). Dweck and Leggett (1988) proposed that the stronger a certain goal orientation has been internalized, the weaker the expected impact of the current motivational climate on the athlete’s goal orientation. However, although the motivational climate may have a minimal influence on athletes’ goal orientations once established, it is unclear how influential the perceived motivational climate (parent, peer, and coach-created) may be on various psychological outcomes in addition to, or separate from, goal orientations’ influences. Thus, in considering a potential motivational climate – goal orientation – mental toughness relation, attention must be paid to both situational (motivational climate) and dispositional (goal orientation) factors, as both may influence the adoption or strengthening of those characteristics considered indicative of mentally tough athletes.

Motivational Climate and Mental Toughness. As previously mentioned, the environments (parent, coach, or peer initiated) in which athletes develop, learn, and compete have been identified as important contributors to mental toughness development. Although the existing qualitative studies examining mental toughness development (e.g., Connaughton et al., 2008; Connaughton et al., 2010; Gucciardi et al., 2009; Weinberg, Butt, & Culp, 2011) mention various environmental factors considered important, a few key components have emerged that appear to parallel motivational climates findings in sport. For example, the influence of coaches in creating
confident, motivated, and resilient athletes has received attention both in the mental toughness development and motivational climate literature. Gucciardi et al., (2009), based on interviews with elite male coaches, discussed the importance of coaches establishing a positive and supportive relationship with their athletes, emphasizing hard work and pushing themselves to their physical limits, viewing mistakes as learning opportunities, and taking personal responsibility for actions in order to build the mental toughness characteristics of emotional intelligence, concentration, perseverance, and self-motivation. These coach messages and behaviors are very similar to ones composing a task-involving motivational climate (e.g., Smith et al., 1995; Weiss, Amorose, & Wilko, 2009). Indeed, Connaughton et al. (2011) described mental toughness development occurring in part from coaches “nurturing the correct motivational climate that was challenging, rewarding, enjoyable, and enabled the efficient mastery of relevant skills.” (p. 149). Not surprisingly, many of the positive outcomes associated with a coach created task-involving climate – high levels of intrinsic motivation, sport competence, effort, and low levels of anxiety (Smith et al., 2007) – are consistent with descriptions of a mentally tough athletic profile. Gucciardi et al., (2009) also identified certain actions performed by coaches that may impede the development of mental toughness, such as imposing unrealistic expectations, overemphasizing success to the detriment of player development, and not encouraging the adoption of personal responsibility. These messages and behaviors are thought to undermine athletes’ enjoyment and motivation, hurt their confidence, and increase their anxiety (Gucciardi et al., 2009).

Similarly, there appears to be much overlap between the parent and teammate messages and behaviors thought to aid in the development of mental toughness, and the descriptions of task-involving motivational climates created by parents and peers. For example, a sample of elite
gymnasts interviewed on the development of mental toughness cited the importance of parents providing support ‘with no pressure,’ providing guidance, instilling a hard work ethic, and encouraging an internalized desire for success (Thelwell et al. 2010). Mallett and Coulter (2011), summarizing research on parental influences on mental toughness, also mentioned the value of parents promoting learning, providing ongoing support, and emphasizing a positive approach to sport as keys to developing a winning mentality. These descriptions of parental influence on mental toughness appear to promote messages, behaviors, and environments that constitute a task-involving climate (Anderson et al., 2003; Roberts et al., 2007).

Although most research studies have focused on coach and parent influences on mental toughness, the importance of teammates has not been entirely overlooked. Thelwell et al. (2010), in their study with elite female gymnasts for example, discussed teammates who provided emotional support, encouragement, and learning opportunities, as well as pushed each other to work harder and perform better as valuable influences on mental toughness. In examining positive psychological attributes in sport more broadly, various research studies have also assessed teammate influences, with similar findings to Thelwell et al. (2010). For example, Gould et al. (2002) in their interviews with ten U.S. Olympic champions, found that teammates who provided encouragement and support and modeled positive psychological and physical skills were cited as important for “fostering, nurturing, and instilling helpful psychological characteristics” (p. 193).

In attempting to understand the mechanisms by which mental toughness emerges, researchers have highlighted certain environments that they believe may help to foster or hinder development. Although a specific and detailed connection between certain types of motivational climates initiated by parents, coaches, and peers and mental toughness has not yet been
established, the previously discussed research suggests that a task-involving motivational climate may be an important variable in its development, and that an ego-involving climate may hinder it. Thus, it appears that the current motivational climates created by parents, coaches, and peers in which athletes’ live, train, and compete on a daily basis will directly relate to athletes’ mental toughness. Motivational climates may be considered situational variables that directly interact with the individual encodings, goals, beliefs, affects, and self-regulation skills of athletes and contribute to either adaptive or maladaptive behaviors in sport (e.g., giving up when losing, not putting in full effort in the weight room, losing composure under pressure). Athletes who feel supported, encouraged, and respected by significant others (i.e., immersed in task-involving climates) may more likely to display mentally tough behaviors than athletes immersed in ego-involving climates because they have gotten feedback and encouragement that increases their competence beliefs, expectations and values for success, and motivations to improve.

Goal Orientation and Mental Toughness. As described in achievement goal theory, the sport climates created by parents, coaches, and peers become internalized over time by athletes and influence the way they approach achievement related situations (e.g., sports; Ames, 1992; Dweck & Leggett, 1988, Nicholls, 1984). This dispositional tendency is referred to as the athlete’s goal orientation, and, as previously discussed, is conceptualized along two main dimensions: task and ego. According to Harmison’s (2011) and Gucciardi et al.’s (2009) conceptualizations, mental toughness is not really about the amount of confidence, emotional control, or consistency that an athlete displays; rather, it reflects athletes’ beliefs, attitudes, values, and cognitions that subsequently determine how they approach sport, think about themselves, and behave under a variety of contexts. Thus, an athlete’s goal orientation, already shown to be an influential variable in sport settings (see Biddle, Wang, Kavussanu, & Spray,
2003 for a review), particularly in how individuals perceive and approach athletic achievement (Roberts et al., 2007), may be a key determinant of mental toughness. Both goal orientation and mental toughness have been conceptualized as frameworks through which achievement striving and various behaviors and outcomes (e.g., psychological, performance) in sport may be understood, and I propose that examining a potential relation between the constructs may prove fruitful for applied work and advancing knowledge of mental toughness. Athletes’ goal orientations, influenced and fostered by the motivational climates they are exposed to, would be expected to directly influence their mental toughness. In other words, the differential beliefs, attitudes, values, and cognitions of task and ego oriented individuals and the way that they conceptualize success, failure, effort, talent, and improvement impact their confidence, persistence, motivation, emotional states, and ultimately, their performance.

Task oriented individuals, as compared to low task and high ego oriented individuals, are more persistent during practices, have higher levels of sport competence and self-efficacy, report greater enjoyment, satisfaction and flow, have less competitive anxiety and worry, and engage in more adaptive learning strategies (Biddle et al., 2003). Many of these characteristics (e.g., high levels of sport competence and persistence, low anxiety) also have been discussed as reflective of mental toughness (Jones et al., 2002; Bull et al., 2005; Sheard, 2010). Perhaps more importantly, however, are the underlying ways in which mentally tough and task-oriented athletes conceptualize success, failure, talent, and effort, frameworks that ultimately guide their feelings, thoughts, and behaviors in and out of their training and competitive venues. For example, two defining aspects of mental toughness are a high degree of motivation and a resilient attitude (handling mistakes, setbacks, and successes, never give up determination; Bull et al., 2005; Jones et al., 2002; Thelwell et al., 2005). Goal orientation research would suggest
that these characteristics are the result of a task-orientation, through which both losses and successes are perceived as learning and improvement opportunities, and an orientation from which athletes are driven by self-referenced goals and intrinsic pleasure, resulting in consistently high motivation and effort (Ames, 1984; Nicholls, 1989). Similarly, the ability to handle pressure effectively has been discussed in the mental toughness literature (e.g., Thelwell et al., 2005), and may be a function of an athlete perceiving the pressure of competition as a challenge and a chance to demonstrate his or her talents (task orientation; Duda, 1993) rather than a potential threat to his or her efficacy and an opportunity for failure (ego orientation; Duda, 1993).

Conversely, a significant negative relationship may exist between an ego orientation and mental toughness. It is important to note that individuals high in task orientation or ego orientation both can be considered competitive, interested in winning, and goal directed. However, it is the meaning and importance placed on competition and winning, as well as the goals that are set, that distinguish ego oriented individuals from task oriented ones, and which could impact levels of mental toughness. Specifically, ego oriented athletes place a high degree of emphasis on being better than others and consider losing as indicative of failure. Subsequently, research has shown that when faced with a competitive situation where they believe there is a likelihood of losing, high ego oriented individuals are more likely than task oriented ones to demonstrate lower effort, devalue the activity, and have higher anxiety, as well as a greater chance of withdrawing from the competition completely (Lewthwaite, 1990; Boyd, Callaghan & Yin, 1991). The aforementioned outcomes are thought to result from a desire to protect one’s esteem and efficacy, which, for ego oriented individuals, are strongly tied to winning and being better than others (Jagacinski & Nicholls, 1984; Roberts et al., 2007). Various other negative psychological and performance outcomes (e.g., high anxiety, decreased
motivation and effort, increased burnout) have been shown to correlate with a high ego goal orientation (cf., Biddle et al., 2003), outcomes that are in contrast to descriptions of mental toughness in sport.

In sum, the differential ways in which task and ego oriented athletes perceive success, competition, mistakes, and achievement have been shown to directly relate to various outcomes (psychological and performance) in sport. Based on established research on both goal orientation (e.g., Ames, 1992; Roberts et al., 2007 and mental toughness (e.g., Gucciardi et al., 2009; Harmison, 2011), a connection between task and ego orientations and mental toughness seem not only reasonable, but also potentially valuable for advancing our understanding of why certain athletes demonstrate mental toughness under a variety of situations, whereas others do not. For example, athletes who shy away from the spotlight in high pressure situations and demonstrate high levels of anxiety when competing may be simply labeled as not mentally tough, when in fact it is their views of competition, success, and winning which negatively influence their performance under high pressure situations specifically. Thus, establishing relations between goal orientation and mental toughness may provide a more comprehensive understanding of how athletes operate in sport and what can be done to improve motivation, confidence, persistence, and performance, a departure from labeling athletes as either mentally tough or not.
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