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The present investigation examined the influence of athletic identity, expectation of toughness, and reported attitude toward pain and injury on instrumental and emotional social support help-seeking tendencies for the pains and injuries athletes experience during their participation in sports. This investigation involved the administration of a self-report survey to 222 student-athletes representing 12 athletic teams at two Midwestern NCAA Division III institutions. Targeted teams for participation included men's and women's teams for the sports of basketball, ice hockey, and swimming. Results indicated that the expectation of toughness aspect of the sport ethic, which involved willingness to play through pain and willingness to make physical sacrifices for the game, along with attitude toward pain as something to be denied and ignored, negatively influenced athletes' help-seeking tendencies for pains and injuries experienced during sport participation. An athlete who experiences pain and injury and chooses to ignore or deny its occurrence places himself or herself at risk for experiencing more severe and potentially disabling injury. In addition, significant mean gender differences were found for expectation of toughness and instrumental and emotional social support help-seeking tendencies. Significant mean differences based on sport were found for athletic identification and expectation of toughness. It is clear from this investigation that athletes' expectations of toughness in sport, in particular, negatively influenced athletes' willingness to seek help for pains and injuries. Additional research is warranted to address what can be done to buffer the effects of the sport ethic and promote athletes' willingness to seek help for pains and injuries experienced during participation in sport.

THE INFLUENCE OF ATHLETIC IDENTITY, EXPECTATION OF TOUGHNESS, AND ATTITUDE TOWARD PAIN AND INJURY ON ATHLETES' HELP-SEEKING TENDENCIES

by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

Athletes accept risk of physical injury every time they prepare for competition through practice or step onto the competitive fields of play, some athletes to a greater degree than others. There is a normalization of this risk acceptance within the culture of sport. Nixon (1993) surveyed nearly 200 male and female athletes participating at the Division I level in a variety of sports. Over 75% of these athletes reported having experienced significant injuries, and nearly all of the athletes reported having played while hurt. Higher level athletes who are willing to accept the risk and play through pains and injuries are often glorified in the eyes of the media and spectators. Commentators within professional football can be heard complimenting athletes for being tough and legitimize players' injuries as "just a part of the game" (Trujillo, 1995, p. 413). Young athletes, seeing these tough athletes held up as role models, may readily take on the beliefs of the culture of risk themselves. In order to be considered athletes, they too may feel they need to be willing to make the physical sacrifices for the game and play through pains and injuries, regardless of any long-term health consequences.

A number of psychosocial factors may influence both athletes' risks of experiencing injuries, as well as their emotional and behavioral responses following injuries (Andersen & Williams, 1988; Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998; Williams & Andersen, 1998). Based on the research performed during the 1980s and early 1990s, an integrated model of the psychosocial response to athletic injury was

developed by Wiese-Bjornstal et al. (1998). This was the first model to identify both personal and situational factors that may influence athletes' emotional and behavioral responses to athletic injuries, and this model provides a theoretical basis for the current investigation.

In the Wiese-Bjornstal et al. (1998) model, personal factors including injury-related factors (e.g., injury history, type of injury, injury severity), personality factors (e.g., self-motivation, athletic identity), and demographic information (e.g., gender, age, ethnicity) influence one's interpretation of the injury. Among these personal factors is athletic identity, which Brewer, Van Raalte, and Linder (1993) described as the degree to which athletes identify themselves with their roles as athletes. A strong identification as an athlete can lead to positive outcomes, such as adherence to extensive training programs leading to improved athletic performance (Danish, 1983). However, when an athlete's athletic identity becomes too strong or when athletic identification becomes the sole source of information regarding how athletes see themselves, negative consequences can result. For those athletes who identify themselves exclusively as athletes, even minor or moderate physical injuries can have catastrophic psychological effects. The presence of a physical injury may threaten to take away the athlete component of the individual's identity. If they only see themselves as "athletes", then they are left not knowing who they are or where they belong following injuries. To minimize the risk of losing their core identity, these athletes are likely to make significant physical sacrifices in order to maintain their athletic identity, including playing through pains and injuries.

The Wiese-Bjornstal et al. (1998) integrated model also identified situational factors including factors related to the nature of the sport itself (e.g., type of sport, level

of participation, time in season, playing status), social factors stemming from involvement in sport (e.g., teammate influences, coach influences, sports medicine team influences, sport ethic), and environmental factors (e.g., rehabilitation environment, accessibility to rehabilitation). One social-situational factor identified in the model, the sport ethic, has been described as representing four key elements involved in the culture of risk associated with sport participation, including the acceptance of risk and willingness to play through pain, the willingness to make sacrifices, a continual striving for distinction, and a refusal to accept limits (Hughes & Coakley, 1991). Much like athletic identity, some subscription to the sport ethic is likely to be healthy and lead to positive outcomes. However, over-emphasis and overcomformity to the risk and sacrificial components of the sport ethic have the potential to lead to negative consequences. The risk comes when athletes follow the sport ethic, often to the extreme, without questioning it and placing their own safety and well-being at risk (Eitzen, 2006). These negative consequences can result when athletes refuse to accurately interpret and accept that injuries have occurred. This misinterpretation and potential refusal to acknowledge the injuries may lead to athletes' continued participation in sport following injuries, resulting in increased severity of the injuries or risk of additional injuries.

The primary intent of this investigation was to begin to address the influence of athletes' acceptance of the sport ethic on help-seeking tendencies for pains and injuries. According to the integrated model, these personal and situational factors, including athletic identity and belief in the sport ethic, influence athletes' cognitive appraisals of the injuries (Wiese-Bjornstal et al., 1998). During cognitive appraisal, athletes examine the demands of the situation, evaluate their resources for dealing with the situation, and

consider the consequences for their potential responses. During this phase, athletes gauge the severity of the injuries to determine whether they have sufficient coping strategies to continue participation or whether injuries are going to stop them from participating and perhaps require medical attention. Athletes may also determine the injuries are not significant and conclude the pains and injuries experienced can be played through. Brewer (1994) proposes that athletes' perceptions of athletic injuries are more important than the actual occurrences of the injuries in determining how athletes respond to the physical injuries. These perceptions are based on athletes' abilities to accurately interpret the severity of the injuries and on their willingness to accept the presence of the injuries (Rose & Jevne, 1993). Athletes' cognitive appraisals of physical injuries, including interpretations, acknowledgements, perceived abilities to cope with the injuries, and potential consequences following attempts to cope with the injuries, influence how athletes respond emotionally and behaviorally to the injuries. Athletes who accurately interpret the severity of the injury and accept it are most likely to seek help for the injuries, resulting in a decreased risk of further, more significant injuries. However, athletes who accurately interpret injury severity, but consciously choose to deny its occurrence, are likely to continue participation and refrain from seeking help. As a result, these athletes experience increased risks of making the initial injuries worse, as well as experience increased risks of additional injuries.

Although there are a number of personal and situational factors that may be examined, it was the intent of this investigation to begin to address the role of the sport ethic. It was hypothesized within this investigation that the two constructs of athletic identity and expectation of toughness related to athletes' participation in sport were related to athletes' help-seeking tendencies. For example, athletes with greater

expectations of toughness for those considered athletes and higher levels of athletic identification were hypothesized to seek less help for their pains and injuries in order to live up to their athlete title and live up to the expectations placed upon them. However, athletes with lower levels of athletic identity may equally believe in the expectation of toughness for those seen as athletes, yet not for themselves; they may not feel the need to live up to those expectations as they do not see themselves as athletes.

Emotional and behavioral responses follow the acknowledgement and cognitive appraisal of the injuries. For some athletes, emotional responses, involving anger and frustration, may occur as they realize the injuries are going to keep them out of the big game or potentially end their athletic careers. Other athletes may view the injuries as positive in nature and providing relief. For these athletes, the injuries may be seen as safe escapes from the sports or activities they are being pressured to play, or an acceptable exit from a poor performance. The cognitive appraisals and emotional responses toward the injuries influence athletes' behavioral responses. In the case of acute injuries, athletes who have strong desires to participate in sport and see injuries as something that must be overcome are more likely to attempt to "walk off" the injury and continue to play despite the pain being experienced. Athletes seeing injuries as a safe way out of a pressure situation may be more likely to stay down when the injury occurs and seek assistance to manage the injury.

Behavioral responses to athletic injuries may involve a continuum of responses ranging from the continuation of play despite pain and discomfort to immediate discontinuation of play and seeking of help to manage the injuries. Many athletes choose to play hurt to maintain their reputations of being tough, yet encouraging athletes to acknowledge, accept, and seek help for pain and injuries experienced in sport may

promote the appropriate management and treatment of the injuries. Although athletes likely partake in a number of coping resources in response to pains and injuries in sport, the focus of this investigation was on the role of the sport ethic, particularly the expectation of toughness, on athletes' help-seeking tendencies. Therefore, athletes' tendencies to seek instrumental and emotional social support for the pains and injuries they experience during sport participation were examined in this investigation. Instrumental social support involves seeking advice, assistance, or information (Carver, Scheier, & Weintraub, 1989). Specifically, instrumental social support as it is related to help-seeking for athletic injuries can involve seeking information about the nature of the injury and ascertaining from others what concrete tasks need to be done to properly manage the injuries. On the other hand, emotional social support involves getting sympathy and understanding from significant others (Carver et al., 1989). Particular to athletic injury, emotional social support may involve seeking a safe space in which athletes are able to talk about their thoughts and feelings about the injuries.

Within this investigation, the relationships among five constructs were examined. To provide a common understanding of the terminology, definitions of these key constructs are provided below.

1. Athletic Identity. Described as the degree to which athletes identify themselves with their roles as athletes (Brewer et al., 1993).

2. Expectation of Toughness. Component of the sport ethic related to the expectation of exhibiting toughness regarding risk, pain, and injury in sport (Nixon, 1996b) and the *No Pain, No Gain* mentality.

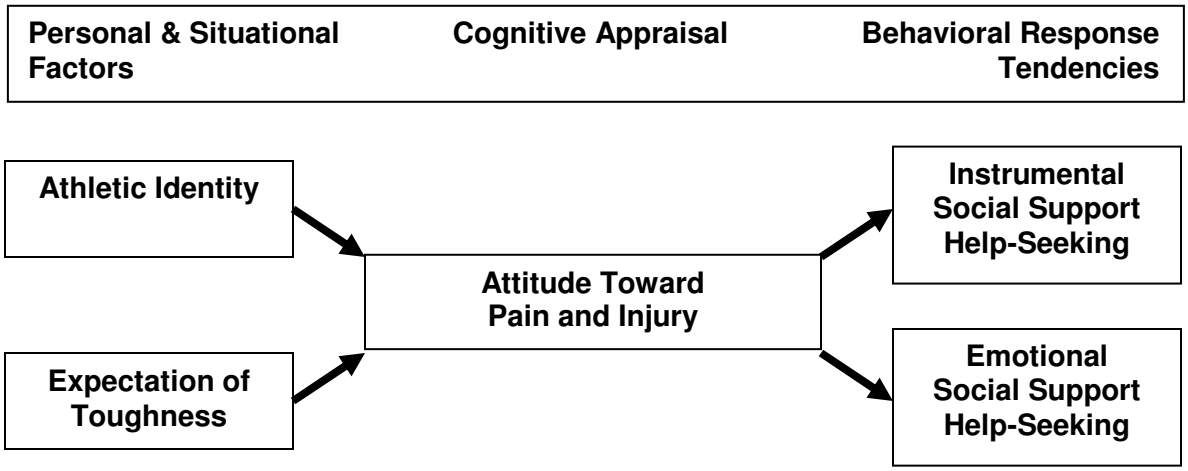
3. Attitude Toward Pain and Injury. Mind-set of toughness and use of general coping strategies that allow individuals to ignore pain and minimize its impact on performance.

4. Instrumental Social Support Help-Seeking Tendencies. A form of problem-focused coping that involves the seeking of advice, assistance, or information about the situation/stressor (Carver et al., 1989).

5. Emotional Social Support Help-Seeking Tendencies. An aspect of emotion-focused coping that involves seeking moral support or understanding (Carver et al., 1989).

In general, athletes often accept the risk of physical pain and injury as a price to be paid for their sport participation, and to varying degrees they choose to play through pains and injuries, regardless of the potential long-term health consequences of such actions. This investigation specifically examined the roles of athletic identity and expectations of toughness on athletes' attitudes toward pain and injury and instrumental and emotional social support help-seeking tendencies following injuries. (See Figure 1.) Many athletes are socialized from their days in youth sport to just "rub a little dirt on it and you'll be fine", rather than being encouraged to accurately recognize and acknowledge the pains and injuries they experience during their participation in sport. This socialization promotes the ideals of playing hurt and decreases the likelihood that proper management and treatment of the injuries are sought.

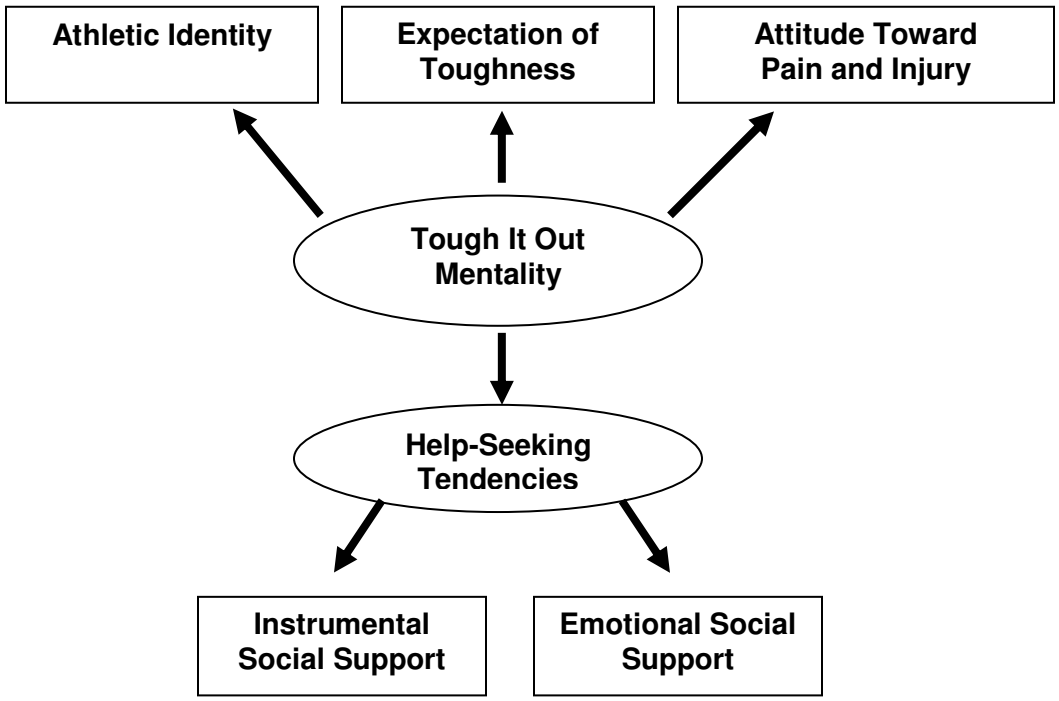
Figure 1. Primary model of constructs being addressed in this investigation.



Research addressing the role of the sport ethic in relation to behavioral responses following athletic injury is limited. To date, the majority of research addressing the sport ethic has originated within sport sociology literature (Hughes & Coakley, 1991). In addition, the sport ethic was identified by Wiese-Bjornstal et al. (1998) as a critical construct to be addressed by sport psychology researchers investigating the psychological response to sport injury. It was hypothesized within this investigation that athletic identity and belief in the sport ethic influence athletes' attitudes toward pain and injury, which in turn influence instrumental and emotional social support help-seeking tendencies. However, it is possible that an athlete's attitude toward pain and injury may actually be an additional personal factor that influences instrumental and emotional social support help-seeking tendencies for pains and injuries working in conjunction with athletic identity and belief in the sport ethic. Due to the preliminary nature of the work addressing the role of the sport ethic on responses to pains and injuries, an alternative model was tested using athletic identity, expectation of toughness, and attitude toward

pain and injury to represent one factor (Tough It Out Mentality) and instrumental and emotional social support help-seeking tendencies to represent the second factor (Help-Seeking Tendencies). (See Figure 2.)

Figure 2. Alternative model of constructs being addressed in this investigation.



Statement of Research Questions

Many athletes push their bodies to the breaking point in the name of their sport, and as a result may risk permanent disability and even death. Athletes learn very early in their athletic careers that being tough is a highly regarded trait. They are taught they must be willing to “take one for the team” or told they should “tough it out” in order to be respected and successful as athletes. This mentality, known as the sport ethic, is described as “a framework within which (athletes) learn to define sacrifice, risk, pain, and

injury as the prices that must be paid to be competitive athletes" (Wiese-Bjornstal, 2000, p. 60). By gaining a better understanding of the social forces that influence athletes' responses to pains and injuries, sports medicine personnel may be better prepared to educate student-athletes and coaches regarding the forces at play and may also work to promote a safe and supportive environment for athletes to seek help for the pains and injuries they experience during sport participation. This, in turn, will allow athletes to seek and receive the necessary medical care to address their pains and injuries, promoting an optimal environment for healing and recovery.

The intent of this investigation was to examine the influence of athletic identity, expectation of toughness, and reported attitude toward pain and injury on instrumental and emotional social support help-seeking tendencies for the pains and injuries athletes experience during their participation in sports. More specifically, this study investigated the following research questions:

Research Question 1. Are athletic identity, expectation of toughness, and reported attitude toward pain and injury related to athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries experienced during sport participation?

> Research Question 1a. Do athletic identity and expectation of toughness predict reported attitude toward pain and injury and, in turn, does attitude toward pain and injury predict athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries?
>
> Research Question 1b. Do athletic identity, expectation of toughness, and attitude toward pain and injury, together, predict athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries?

Research Question 2. Are there differences for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies and on item response for the RPII Tough subscale and SIP TCR scale based on gender (i.e., male and female) and sport (i.e., ice hockey, basketball, and swimming)?

Research Question 2a. Are there significant mean differences for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on gender (i.e., male participants and female participants), sport (ice hockey, basketball, and swimming), and the interaction of gender and sport?

Research Question 2b. Do the items of the RPII Tough subscale and SIP TCR scale exhibit differential item functioning when the reference and focal groups are males versus female or when the reference and focal groups are type of sport (e.g., ice hockey versus basketball)?

Hypotheses

Athletes likely differ in the degree to which they identify themselves as athletes and their expressed levels of toughness. These beliefs and perceptions in turn influence athletes' attitudes toward pains and injuries, as well as influence their help-seeking tendencies for pains and injuries. It is expected that athletes who report higher levels of athletic identity and greater levels of expectation of toughness will report greater willingness to avoid and ignore pains and injuries to allow for continued participation. As a result, these athletes will be less likely to seek instrumental or emotional social support or report help-seeking tendencies for pains and injuries. More specifically, the

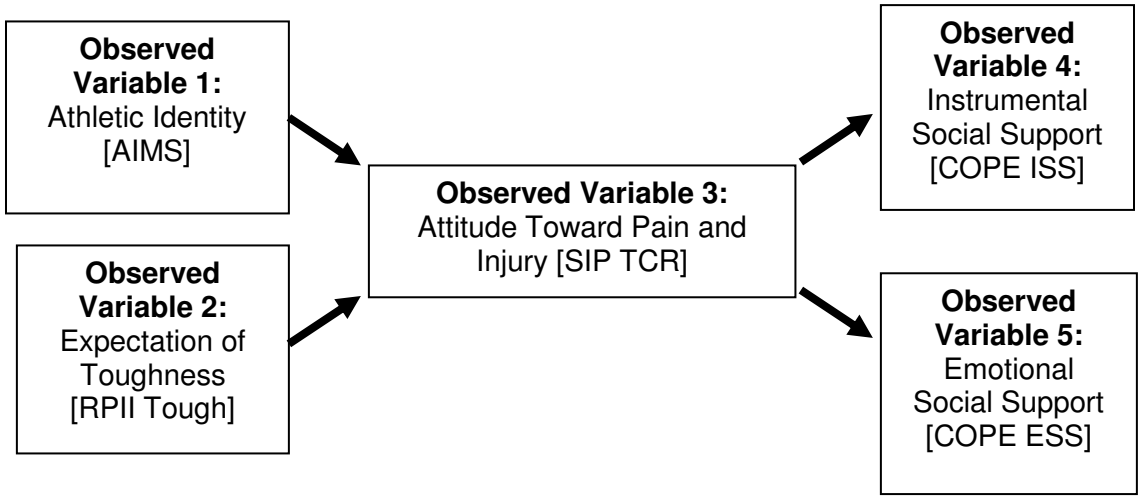
hypotheses for this investigation included the following:

Research Question 1. Are athletic identity, expectation of toughness, and reported attitude toward pain and injury related to athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries experienced during sport participation?

Research Question 1a. Do athletic identity and expectation of toughness predict reported attitude toward pain and injury and, in turn, does attitude toward pain and injury predict athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries?

Hypothesis (Primary). Athletic identity and expectation of toughness will predict attitude toward pain and injury, which in turn will predict instrumental and emotional social support help-seeking tendencies. (See Figure 3.)

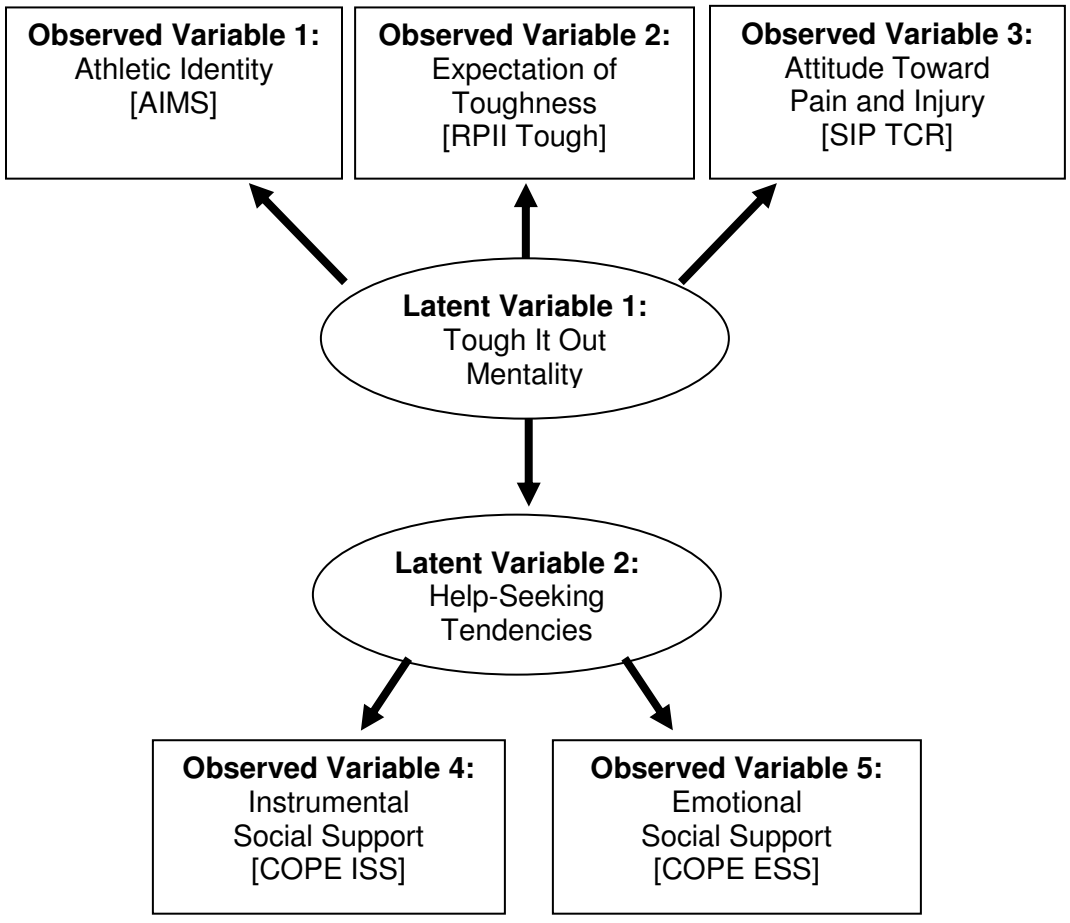
Figure 3: Primary Structural Path Analysis Model Hypothesis



Research Question 1b. Do athletic identity, expectation of toughness, and attitude toward pain and injury, together, predict athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries? (See Figure 4.)

Hypothesis (Alternate). Athletic identity, expectation of toughness, and reported attitude toward pain and injury will collectively represent a *Tough It Out Mentality* latent variable, which will predict *Help Seeking Tendencies* latent variable represented by instrumental and emotional social support help-seeking tendencies.

Figure 4: Alternative Structural Regression Model Hypothesis



Research Question 2. Are there differences for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies and on item response for the RPII Tough subscale and SIP TCR scale based on gender (i.e., male and female) and sport (i.e., ice hockey, basketball, and swimming)?

Research Question 2a. Are there significant mean differences for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on gender (i.e., male participants and female participants), sport (ice hockey, basketball, and swimming), and the interaction of gender and sport?

Hypothesis 1. Male athletes are expected to report greater athletic identity, expectation of toughness, and disassociative attitudes that allow athletes to continue to participate despite pain and injury, while female athletes are expected to report greater instrumental and emotional social support help-seeking tendencies.

Hypothesis 2. No differences are expected on athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on sport.

Hypothesis 3. No differences are expected on athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on the interaction of gender and sport.

Research Question 2b. Do the items of the RPII Tough subscale and SIP TCR scales exhibit differential item functioning when the reference and focal groups are males versus female or when the reference and focal groups are type of sport (e.g., ice hockey versus basketball)?

Hypothesis 1. No differences are expected on item responses on the RPII Tough and SIP TCR scales based on gender and sport.

Significance

Athletes are taught at a very early age that being able to tolerate pain and play with injury are rewarded behaviors and represent the glorification of "the character of athletes who endure with a high pain threshold, sacrifice for the team, and ignore the personal consequences" (Nixon, 1993, p.188). Meanwhile, athletes who choose to openly talk about their pain and injury may be viewed negatively as "weak" or as "damaged goods". Athletes are encouraged that if they can walk, they should play. They are often pressured by teammates, coaches, and even sports medicine personnel to play as long as possible with pain and injury. And, when the pain finally becomes too much, the emphasis or pressure often changes to getting the athlete back to participation as soon as possible. "Since the culture of risk is part of what identifies them as members of an athletic subculture, (athletes) are unlikely even to consider challenges" to the system (Nixon, 1992, p. 130).

It is clear that the acceptance of the culture of risk in sport places athletes at risk when they choose to ignore pain and injury and risk more significant injury. Athletes are sent a variety of messages carrying the expectation that they must be willing to endure physical pain and injury in the name of their sport. Gaining a better understanding and

appreciation of the social forces at play when athletes experience pains and injuries may assist sports medicine personnel in standing a fighting chance against the powerful *sport ethic*. This understanding and appreciation will allow sports medicine personnel to provide athletes with a safe and supportive environment in which to seek assistance for their pain and injuries, which in turn will encourage athletes to seek help and minimize risk of permanent injury or disability.

CHAPTER II

REVIEW OF THE LITERATURE

Injury is a common result of participation in sport, despite a sense of invincibility by many athletes. It is believed that illnesses and injuries themselves are socially constructed. “Most people experience health symptoms all the time, but interpretation and actions vary” (Cardol, Groenewegen, Spreenuwenberg, Van Dijk, Van Den Bosch, & DeBakker, 2006, p. 921). In other words, on a daily basis distinctions are made whether the discomforts and pains being experienced are considered normal or whether they are out of the ordinary and require medical attention. These distinctions are dependent on the messages received from society as a whole and on the messages received from the significant others around us. These interactions provide the basis for how discomfort and pain are viewed. The distinction between normal and abnormal pains can also be influenced by previous personal experiences with similar discomforts, pains, and illnesses.

Epidemiological studies in the United States suggest that more than 70 million injuries occur each year that require medical attention or involve at least one day of restricted activity due to the injury (Williams, 2001). Within sport, Booth (1987) estimated that more than 17 million injuries occur each year. Hardy and Crace (1990) reported that nearly half of all amateur athletes experience an injury each year that keeps them from participating in sport, and nearly 25% of these injuries are severe enough to require at least one week of restriction from sport participation. With 1 in 2 athletes expected to be

injured during their participation in sport each year, researchers are addressing psychological antecedents and consequences related to athletic injury risk and incidence. Alone, the above statistics indicate a clear need for research to determine strategies to reduce injury risk and prevent injuries. It is equally important to determine strategies to help athletes who have been injured to progress smoothly through the recovery process and to help these athletes return safely to sport participation.

Yet, the previously mentioned injury incidence statistics only indicate the incidence of injuries that require medical attention and those injuries that are accompanied by time loss from sport. Within the collegiate athletic setting, Powell and Dompier (2002) found that only 22% of the injuries reported to sports medicine staffs involved a loss of participation time in men's sports and only 16% of injuries in women's sports involved time loss. This study indicates that the vast majority of athletic injuries reported to sports medicine staffs in the collegiate setting do not require time loss and that athletes often continue to participate in their sport despite the pains and injuries they experience. These statistics are based on injuries that were reported to appropriate personnel and that the injuries were properly recorded. The numbers still do not reflect the potential number of injuries athletes play with and are not reported to appropriate personnel.

Nixon (1994a) found that of the 156 athletes surveyed that indicated they had previously experienced a significant injury requiring at least 5 days of missed participation or a missed event, 145 (93.6%) athletes reported they had played hurt and 71 (45.5%) of the athletes reported they continued to experience lingering effects from the injuries. In addition, 46 of the 156 athletes (29.5%) reported that they were currently actively participating in their sport, despite the presence of an injury or considerable pain

at the time the survey was administered. Therefore, it is likely that many of the injury incidence statistics greatly underestimate the true incidence of injury in sport. The need for research addressing the physical and psychological antecedents and consequences of athletic injury is great, as is the need for the development of strategies to prevent injuries from occurring and to promote proper management and treatment when injuries do occur to allow for optimal health and healing.

Participation in sport involves an inherent risk of physical injury, although the levels of risks may vary depending on the physical nature of the sports. The Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletes (AMCIA) classifies athletes' risks of experiencing injuries while participating in sports based on two factors, injury risk factors and catastrophic index (NATA, 2003). The injury risk factors represent athletes' potentials for experiencing injuries while participating in the sport, while the catastrophic index addresses athletes' potentials for experiencing life-threatening injuries, spinal cord injuries, major head injuries, or permanent disability while participating in the sport. The rating system was developed as a tool to assist sports medicine personnel and other athletics' personnel in determining the appropriate amount of emergency medical coverage for particular sports.

According to the recommendations and guidelines for AMCIA, sports such as football, men's and women's ice hockey, wrestling, and men's basketball are included in the increased risk category due to the high physical contact of the sports and the increased risk of experiencing catastrophic injury. Moderate risk sports include women's basketball, men's and women's diving, men's and women's soccer, and men's and women's volleyball. Baseball, softball, men's and women's cross country running, men's and women's swimming, and men's and women's tennis are included in the lower risk

category due to the limited physical contact involved in the sports and decreased risk of experiencing catastrophic injury while participating in those sports.

Despite a sense of invincibility, injury is often an inevitable consequence of regular participation in sport, particularly in sports involving more physical contact. In 1982, the NCAA developed an Injury Surveillance System (ISS) to provide current and reliable data on injury trends in intercollegiate athletics (NCAA, 2006). The system monitors injuries for 16 different sports with the goal of reducing injury rates through suggested changes in rules, protective equipment, or coaching techniques based on the results. Of the 16 sports monitored, six of the sports are considered winter sports including men's and women's basketball, men's and women's ice hockey, women's gymnastics, and men's wrestling. At this time, swimming has not been monitored, likely due to its low risk for acute and catastrophic injury risk. For an injury to be reported to the NCAA ISS, it must meet the three specific criteria. A reportable injury is one that (NCAA, 2003, p. 91):

1. Occurs as a result of participation in an organized intercollegiate practice or game;
2. Requires medical attention by a team athletic trainer or physician;
3. Results in restriction of the student-athlete's participation or performance for one or more days beyond the day of injury.

According to 2006 NCAA ISS injury reports, men's ice hockey was found to have a game injury rate equivalent to one injury every three games with 49% of all injuries occurring during competition involving time loss of seven days or more. The majority of the severe injuries occurring during games involved shoulder sprains (20%), knee sprains (14%), and concussions (12%). Player to player contact was the top mechanism

of injury (58%), followed by contact with the boards (21%), non-contact (14%), and concussions (12%). In contrast, women's ice hockey injuries equated to one injury for every six games, with 29% of the injuries reported during games requiring seven or more days out of participation. Injuries occurring during women's ice hockey games most commonly involved the lower extremity (31%), followed by upper extremity (30%), and head injuries (25%). Player to player contact was again the top injury mechanism during games in women's ice hockey accounting for 40% of the injuries. Player contact was followed by contact with the ice (15%) and contact with the boards (12%).

Men's basketball statistics demonstrated a game injury rate of one injury every eight games with 30% of those injuries requiring seven or more days out of participation and six percent requiring surgery. Lower extremity injuries accounted for 60% of all competition injuries in men's basketball, followed by injuries to the trunk (14%), and head injuries (10%). Player to player contact accounted for 49% of injuries occurring during competition, while non-contact injuries resulted in 24% of competition injuries. Less than two percent of competition injuries were caused by contact with the rim, standards, or out of bounds objects in men's basketball. Women's basketball had a game injury rate of one injury for every 10 games with 37% of the injuries requiring seven or more days out of participation and eight percent requiring surgery. Lower extremity injuries accounted for 58% of competition injuries within women's basketball, followed by head injuries (21%) and trunk injuries (13%). These injury statistics indicate that injury due to participation in sports, such as ice hockey and basketball, is a likely occurrence and a physical risk of harm is assumed each time athletes step onto the ice or court.

It is evident that injuries are a common and even expected part of sport participation. Moreover, many athletes may feel pressured by others to participate in their sports while injured and feel that playing through pains and injuries are expected components of being athletes, regardless of the potential long-term health consequences of such actions. Nixon (1994a) has performed research addressing personnel within the sport culture who may influence athletes' thoughts and behaviors referred to as the sportsnet. Within Nixon's work, the sportsnet includes addressing the role coaches, teammates, and athletic trainers play in relation to athletes' responses to pain and injury. It was found that nearly half of the 156 collegiate athletes surveyed reported feeling pressed by their coach to play hurt, (Nixon, 1994a). Moreover, 41% of athletes surveyed reported feeling pressed by teammates to play hurt, followed by 17% of athletes felt pressed by athletic trainers.

Long-term consequences of sport injuries have been addressed in research performed by professional athletic associations and players associations. These organizations have done the best job in tracking the impact of sport injury on athletes' lives after retirement from the game. In a 1990 study commissioned by the NFL Players Association (NFLPA), 65% of 870 former players reported having experienced a major injury, an injury that required surgery or forced them to miss at least eight games, while participating in football (Nack & Munson, 2001). Of these athletes, nearly two-thirds of the former players indicated they experienced a permanent disability from their participation in football, which limited their abilities to participate in sport and other recreational activities during their retirement (Nack & Munson, 2001).

Eitzen (2006) suggests that physicians and sports medicine personnel may hasten the problem of lasting effects of injuries by providing athletes with medications

and by providing treatments to injured athletes that allow them to continue participation in sport while injured. However, athletes may be the driving force behind the tendency to push physical limits because they "1) are socialized to accept pain and injury as part of the game and to 'play hurt', 2) fear losing a starting position or even a place on the team, 3) want to keep their careers going as long as possible, 4) feel pressure of teammates or coaches to play, or 5) want to sacrifice themselves for the good of the team" (Eitzen, 2006, p 76). Therefore, to make any changes to the way athletes view pains and injuries and how injuries are managed and treated, it is important to address not only the culture of sport related to athletic injury, but also the role that key sport personnel may play within the culture.

Consider the following scenario:

An athlete approaches. As he gets closer, it becomes apparent that he has a cast on his arm and he proceeds to tell the saga of the past week. He reports that during the track and field meet the other night, he had missed the pit while warming up for the pole vault. Although his arm hurt, he went on to pole vault his typical 13+ feet. He then reports that when he woke up the next morning, his arm had swelled significantly and was quite sore. His mother had taken him to the family doctor where they took x-rays and learned that his arm had actually been fractured during the previous night's event. However, the next question out of the athlete's mouth comes as no surprise; he asks if there is any way he can still pole vault with the cast on his arm in the upcoming track and field meet.

Fast forward 10 months to the section championship wrestling meet. Following his second round match, the same athlete approaches with concern about neck pain after being dropped on his head in a previous match. After evaluation of the injury and a

lengthy discussion between the athletic trainer, the athlete, the athlete's coach, and the athlete's parents, it is decided the athlete will forfeit the section championship match and not participate in any additional matches or practices until undergoing further medical evaluation to rule out more significant injury. As a result, the athlete misses his last opportunity to wrestle against his conference rival, a senior, who would be going down a weight class for the upcoming state tournament.

The previously mentioned athlete likely experienced discomfort in his arm after missing the landing pit during his warm-up run, but decided the discomfort wasn't severe enough to keep him from continuing to participate in the regular season track and field meet without any emergency care coverage. The same athlete distinguished the potential for more significant injury and made a point to seek help from the athletic trainer prior to that section championship match and also abided by the recommended course of management, which included the forfeiture of the championship match.

Therefore, it makes one wonder how do athletes know when to say when regarding participation in their sports with pains and injuries? How do athletes determine how much pain is too much to require them to stop their participation and seek help? What factors influence athletes' willingness to endure pain and injury in the name of their sport and in some cases even risk permanent disability or worse? Most importantly, can these factors be manipulated to encourage athletes to seek help for the pains and injuries they experience during sport participation?

The following sections review the theories and research related to these issues starting with an overview of guiding stress and injury response models. Next, the theoretical models addressing psychological antecedents and injury prevention are described and pertinent research findings discussed. Although pre-injury characteristics

are not a central focus of this investigation, they are being discussed as a lead-in to the post-injury characteristics. In addition, it is important to consider that the pre-injury characteristics that have been identified may also influence athletes' cognitive, emotional, and behavioral responses following injury. The models and research addressing injury response and recovery are discussed next. Lastly, a literature review and review of research discussing the normalization of pain and injury are discussed, including risk of overconformity to the sport ethic.

Stress Models

Selye's Stress Response

In addressing injury prevention and response, researchers have based much of their inquiry on the initial stress-health models, such as that by Hans Selye. Selye defined stress as the "nonspecific result of any demand upon the body" (Selye, 1993, p.7). This definition was based on the work addressing the changes that occur following the introduction of a demand. Through this definition and Selye's work, stress is seen as the response of the body to any perceived change. The stress response is a universal response to any threat, whether real or perceived. Stressors are factors that, when present, have the potential of producing a stress response in an individual. The stress response can be positive or negative in nature, depending on the interpretation of the stressor by the individual. Positive stress responses, such as happiness and joy, are termed as eustress, while negative stress responses, such as anger and frustration, are termed as distress.

In addition to making the distinction between good and bad stress, Selye described how the autonomic nervous system responds to stressful situations through

his General Adaptation Syndrome (1974). The General Adaptation Syndrome involves a three stage process including: 1) the alarm reaction stage, 2) the stage of resistance, and 3) the stage of exhaustion. In the presence of a potential stressor (either real or perceived), the body first prepares to cope with the stressor through physiological and psychological activation. This response is known as the *alarm reaction stage* and functions to prepare the body to either fight the perceived threat or flee to safety to allow for self-preservation. Although this response is critical to survival when a real physical threat is present, such as a wild animal attack or a car nearly hitting you when crossing the street, the stress response often occurs when there is only a perception of a threat without the presence of real imminent danger. Following the body's initial physiological and psychological response to the stressor (fight or flight), resistance to a continued state of activation occurs. The *resistance stage* functions to return the body to a level of homeostasis by decreasing the physiological and psychological arousal that occurred during the alarm reaction stage. This phase can be prolonged when there is continued exposure to the initial stressor, such as when there is a perceived, cognitive threat. However, with the continued exposure to the stressor, the adaptation energy may become depleted leading to stage three, the *exhaustion stage*. During this stage, the systems responsible for the activation of the stress response and those systems responsible for returning the body systems to normal levels begin to breakdown. If the stressor is not removed, permanent damages can result to the systems, and death may occur. If the strength and duration of the stressor is such that the individuals are not overwhelmed, they enter an *adaptation phase* resulting in the individuals becoming stronger than they were initially. According to the General Adaptation Syndrome, under the right circumstances, the exposure to stressors can promote higher levels of

functioning and adaptation.

While the work of Selye added to the literature by defining stress and by providing a basis for additional stress research, its focus on the "nonspecific *general adaptation syndrome* forces an extreme response based definition, and the exact nature of the stressor becomes largely irrelevant" (Brenitz & Goldberger, 1993, p. 4). However, the explanation by Selye does not account for individual differences in the perception and response to stress, which has been indicated to be of most relevance in addressing the stress experience in humans (Brenitz & Goldberger, 1993). The individual differences in how persons interact with potentially stressful environments are represented with cognitive appraisal approach to understanding stress.

Lazarus' Model of Stress Development

To account for individual differences in the activation of the stress response, Lazarus (1966) identified six key decisional components within appraisal and the development of stress, three primary components and three secondary components. Primary appraisal of an event involves addressing what is happening and whether the event is worthy of one's attention (Lazarus, 1993). The individual determines whether the potential stressor is a threat based on previous experiences, knowledge about oneself, and knowledge about the event. Primary appraisal includes three components that are related to the motivational aspects of the encounter with the event. Specifically, primary appraisal includes addressing goal relevance, goal congruence, and the type of ego involvement (Lazarus, 1993). *Goal relevance* indicates whether there is anything at stake to be interfered with by the perceived threat or barrier. If there is nothing to be lost by the presentation of the threat, then no stress response will occur. If the situation is

viewed as relevant to the individual's achievement goals, a stress response will result. The second factor of primary appraisal involves goal congruence. *Goal congruence* refers to whether the conditions are seen as facilitative or obstructive in getting what is desired. This evaluation of the impact of the event on one's desired goal determines whether the conditions are seen as a threat, as potentially harmful, as a challenge, or as a benefit to the individual (Lazarus, 1993). Classification of a stressor as harm occurs when damages or losses have already occurred, while the classification of a stressor as a threat implies that future harm or loss is anticipated by the presence of the stressor. Viewing a stressor as a challenge suggests that although potential barriers and obstacles have been identified, they are seen as components that may be overcome by the individual, and goal achievement is still possible and is viewed more positively. The third factor of primary appraisal involves the type of ego involvement. *Type of ego involvement* addresses the type of personal goal that is at stake in a given situation and refers to one or more of the six types of ego-identity for which we are dedicated. These six types of ego involvement goals have been identified, including self and social - esteem, moral values, ego-ideals, meanings and ideas, persons and their well-being, and life goals (Lazarus, 1993). How the potential stressor is seen to interfere with the type of ego involved in a given situation will result in different stress and emotion responses. Lazarus (1993) suggests that emotions often employ some facet of ego-identity, although there are likely to be individual differences.

If the potential stressor is seen as irrelevant or is seen as a non-threat, then the stress response does not occur. However, if the potential stressor is perceived as threatening or has already caused harm, then a negative stress response occurs followed by the secondary appraisal. *Secondary appraisal* focuses on coping options

and the expectations about what will happen. Similar to primary appraisal, secondary appraisal also contains three components, including attribution of blame or credit, coping potential, and future expectations (Lazarus, 1993). The attribution for blame or credit focuses on addressing who is responsible for the harm, threat, challenge, or benefit, and whether these persons could have controlled the potentially harmful or beneficial actions. It is suggested that when the blame is directed internally, we often blame ourselves and experience emotions such as guilt, shame, or anger toward ourselves. However, when the blame is directed externally, such as toward another person, anger toward that external source often results. Positively, when we take credit for something positive, we experience pride and experience an increase in the related ego-identity, but if positive things happen for which we do not take credit, we may experience the happy emotion, rather than pride (Hume, 1957). Based on the understanding of the situation and the stressor, the individual then decides what can be done in the given situation, and coping occurs. *Coping potential* involves judgment as to whether one can respond to remove the harm or threat and overcome the barrier or challenge in front of them and act to influence the desired change to the person-environment relationship. Lazarus (1993) warns that coping potential does not involve actual thoughts of behavior of coping, but rather an appraisal of important conditions. The final component of secondary appraisal involves *future expectations,* which consists of the consideration of whether the changes in the person-environment interaction are believed to take place and whether these changes will be positive or negative in nature (Lazarus, 1993).

Overall, coping refers to the efforts made to manage demands that are placed upon us that challenge or exceed our resources (Lazarus, 1993). Specifically, Lazarus and Folkman (1984) define coping as “constantly changing cognitive and behavioral

efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Kerr and Miller (2001) recognize three important components of this definition. First, there is an emphasis that coping is seen as a process that results in changes of thoughts and behaviors that is context specific for a given event in time. It is suggested regarding athletic injury, athletes' cognitive and behavioral responses are likely to change depending on factors surrounding the injury occurrence. Second, the coping process is seen as contextual in nature. Based on this, coping must not be viewed as an isolated response, but rather one's response will likely be influenced by many personal and situational factors related to the situation at hand. The third component of the definition focuses on the possible differentiation between the coping process and the outcome of the coping. Lazarus and Folkman (1984) emphasize that coping involves any actions or thoughts a person has about the demand, regardless of whether the coping works or not. The strength of this approach toward stress and coping is the individualized nature of the perception and appraisal of the stressor, as well as on the focus of the context within which the demand presents itself. In the case of athletic injury, it is realistic to presume that an athlete who is injured during the final game of the season will emotionally and physically respond differently than an athlete injured during a non-traditional season practice. It is important to consider additional contextually relevant factors that may influence appraisal and coping responses.

Psychological Antecedents and Injury Prevention

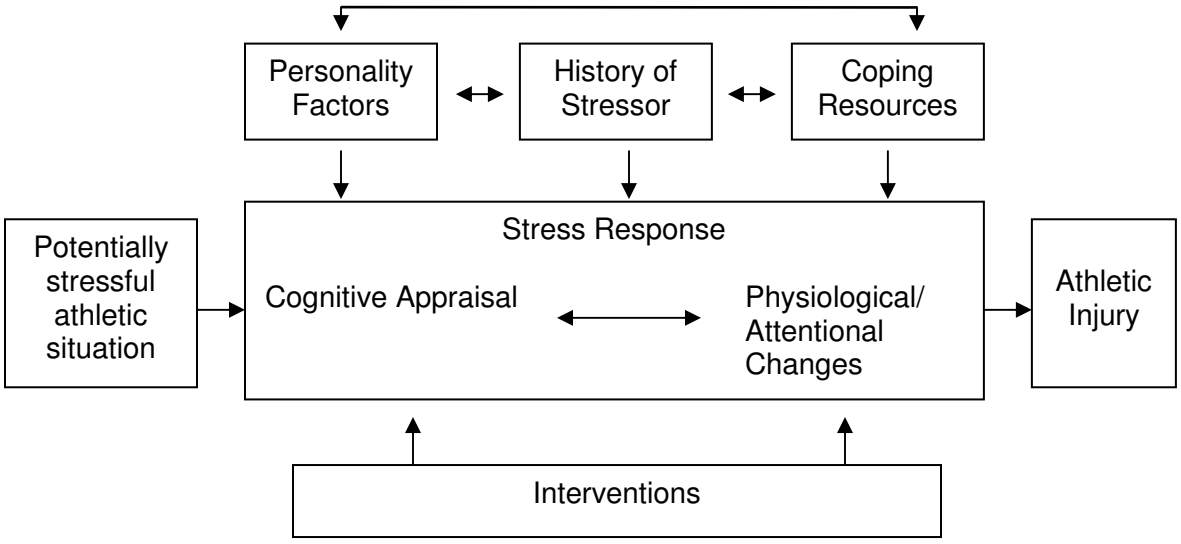
Although this research investigation is addressing athletes' behavioral responses following injury (i.e., help-seeking tendencies) and how specific personal and situational factors may influence those responses, it is also important to acknowledge the presence of factors that may increase athletes' risks of experiencing injury and that these factors may also influence how athletes respond following injury. In light of the high incidence of injuries from sport participation, many factors addressing risk of injury are being researched in an attempt to minimize risk and decrease injury incidence during participation in sport. Great strides have been made to prevent injuries from occurring by addressing physical components related to injury risk, including the improvement of training practices, modification of game rules, and the improvement in construction and effectiveness of protective equipment. However, potential psychological risk factors shown to increase injury risk have not received the same attention by those responsible for implementing systematic changes. Although sport psychology literature is filled with significant findings regarding the myriad of psychosocial factors that influence injury risk, little is being done from a practical standpoint to address these risks.

Stress-Injury Model

Building on the previously discussed stress-health models, Andersen and Williams (1988) provided the first theoretical model identifying psychological antecedents of athletic injury. Although the model had its limitations, it provided an initial framework for researchers to focus their work. The model identified four categories of antecedents, including personality, history of stressors, coping resources, and interventions. In the initial model, it was proposed that when a potentially stressful situation presented itself, it

was these factors that directly influenced the strength of the stress response, which in turn affected risk of injury occurrence. In 1998, Williams and Andersen revised the model to suggest personality, history of stressors, and coping resources may have a direct impact on the stress response, and that these factors may also impact the stress response indirectly through their interaction with each other. (See Figure 5.) Additional arrows were added in the revised model to indicate these added relationships. The revised model also introduced two components within the stress response, cognitive appraisal and physiological/attentional changes.

Figure 5: Revised Stress-Injury Model (Williams & Andersen, 1998)



The cognitive appraisal component of the stress response involves a primary and secondary appraisal of the situation. The primary appraisal involves the assessment of the situation to determine if it is important to the well-being and goal achievement for the individual. If the event is determined to be important, it may lead to a stress response.

The secondary appraisal involves assessing the demands of the situation, but also involves the assessment of the individual's ability to meet those demands and the consideration of potential consequences or outcomes for successfully or unsuccessfully meeting the demands. The perception and interpretation involved in the cognitive appraisal is believed to interact with the physiological and attentional changes observed in the stress response. Together, cognitive appraisal and physiological/attentional changes influence risk of injury in the presence of a potential stressor. To see cognitive appraisal at work, an athlete preparing for a major competition reports being excited and ready to go, while another athlete preparing for the same event reports being very nervous. These athletes may have the same physiological arousal and attentional changes, but the second athlete's negative interpretation of the arousal as anxiety and perception of the situation as distressing increases his/her risk of injury. The general premise of the model suggests the interaction of personality factors, history of stressors, and coping resources influence how a potentially stressful situation is viewed, and in turn, affects the resulting level of stress response. With an increased stress response through a negative appraisal and an increase in physiological arousal and attentional narrowing, the risk of the injury increases. The revised model indicates that interventions may be implemented to address either the cognitive appraisal component or the physiological/attentional changes component of the stress response. Therefore, it is believed the introduction of mental skills training or other modes of intervention that reduce the stress response may also reduce the associated risk of injury.

Personality Factors

Personality factors are one of the components believed to have a moderating effect on injury risk from sport participation. Hardiness, locus of control, sense of coherence, competitive trait anxiety, and achievement motivation were the personality factors identified in the Andersen and Williams (1988) model. Williams (2001) reported that no sport injury research has addressed the influences of hardiness and sense of coherence on injury incidence. Only one study has addressed the relationship between achievement motivation and injury incidence, and no relationship was found (Van Mechelen, Twisk, Modendijk, Blom, Snel, & Kemper, 1996). Of the five personality factors identified in Andersen and Williams' model, locus of control and competitive trait anxiety have received the most attention, but with mixed results. In a sample of freshman college football players, higher injury rates were found in athletes with an external locus of control, where they believed the things that happened to them were outside of their control (Pargman & Lunt, 1989). Yet in a study involving non-elite gymnasts, a stronger internal locus of control was found to be a significant predictor of injury (Kolt & Kirkby, 1996). Within competitive trait anxiety research, increases in trait anxiety in football players were found to have a positive relationship with injury rates for starters, but not for injury rates for non-starters (Petrie, 1993). In relating competitive trait anxiety with cognitive appraisal, the greatest risk of injury was found in athletes who reported high anxiety and perceived that anxiety as being detrimental to performance (Williams, 2001).

Additional personality factors, including mood states and self-concept, have also been compared with injury incidence. Regarding mood states, Lavallee and Flint (1996) found a significant relationship between increases in tension/anxiety and higher rates of

injury. The authors also found a significant correlation between higher tension/anxiety, anger/hostility, and total negative mood state with greater injury severity. Williams, Hogan, and Andersen (1993) found that athletes who experienced more positive states of mind were less likely to become injured. Mixed results have been reported in the influence of self-concept on injury incidence. Young and Cohen (1981) found injured players had greater self-concept prior to tournament play and also viewed themselves more positively relating to their identity, health, and physical appearance. The authors suggested the increased self-concept in the injured players may have been present prior to the injury, influencing their willingness to take more risks, and thus being injured as a result. In contrast, Lamb (1986) looked at female college varsity field hockey players and found players scoring low on self-concept tended to have more injuries than players with higher self-concept scores.

History of Stressors

History of stressors is the second component believed to influence injury risk through its moderating effect on the stress response and is made up by major life events, daily hassles, and previous injury history. Life stress resulting from issues within sport (such as conflicts with teammates, performance issues, etc.) and from issues outside of sport (such as academic problems, issues with significant others, etc.) are believed to negatively affect athletes physically and psychologically. Williams, Tonymon, and Andersen (1990, 1991) found that individuals who reported recent substantial life event stress and daily hassles also experienced greater peripheral narrowing during laboratory-induced stress than did individuals with less reported stress and daily hassles. This increased peripheral narrowing may increase injury risk by decreasing

athletes' abilities to detect important visual cues that may alert athletes to potential danger (Udry & Andersen, 2002).

Early research addressing life stress found a positive relationship between life stress and injury incidence. Fifty percent of athletes with high levels of life stress were found to have experienced an athletic injury involving missed practice or game time, while only nine percent of low level stress athletes and 25% of moderate level stress athletes experienced injuries involving time loss (Holmes, 1970). Consistent with those findings, Bramwell, Masuda, Wagner, and Holmes (1975) found a similar progression of increased injuries with increases in life stress levels. As previously discussed, it is believed that the effect of stress on injury risk is dependent on the individual's perception of the potential stress-inducing situation, and this perception can be either positive or negative in nature. The initial research in the area of life stress addressed only overall event stress without the distinction of whether it was viewed as facilitative or debilitative. In making the distinction, Hardy and Riehl (1988) found injured athletes to have significantly higher negative life event stress levels than non-injured athletes, and injured female athletes were found to have higher total life event stress levels than uninjured females. Williams (2001) reviewed 35 studies addressing the relationship between life event stress and injury and found 30 of the 35 studies (86%) reported significant relationships between life event stress and injury incidence in a variety of sports and competitive levels. Yet, in these same studies only two-thirds found significant positive relationships between life event stress and injury severity, while one-third of the studies found no relationship between life event stress and injury severity.

Coping Resources

The third group of factors believed to directly and indirectly influence stress response is coping resources. Within the original stress-injury model, Andersen and Williams (1988) identified four components of coping resources, including general coping behaviors, social support systems, stress management and mental skills, and medication. In the revised model, medication has been removed (Williams & Andersen, 1998). Overall, research addressing the relationship of coping resources and injury has led to mixed results. In 1986, Williams, Tonymon, and Wadsworth found low levels of coping resources to be a significant predictor of injury in college volleyball players, while Blackwell and McCullagh (1990) found injured athletes had higher scores on life-stress and competitive anxiety, and lower scores on coping resources than uninjured athletes. In addition, Hanson, McCullagh, and Tonymon (1992) found the presence of coping resources influenced injury frequency and injury severity. Similar to findings in personality, coping resources are suggested to have a moderating effect on injury occurrence through its influence on negative life event stress. Smith, Smoll, & Schutz (1990) found a strong relationship between negative life events and injury outcome for athletes with low social support and low coping resources only.

The use of support networks have also been addressed in research dealing with psychological antecedents to athletic injury. Social support has been described as a multidimensional construct involving the seeking of help from others to allow for the completion of a task. This help may take the form of tangible support, such as money, instrumental support, or emotional support. Research has found athletes with reported high levels of social support had a lower incidence of injury, while athletes with low levels of social support experienced more injuries (Hardy & Crace, 1990). Yet, Lavallee

and Flint (1996) found no relationship between level of social support and injury risk. Crocker, Kowalski, and Graham (1998) suggest these gender differences in coping may be due to differences in the types and levels of stressor experienced by men and women that require different coping strategies, and the potential for differences in the way men and women are socialized (through stereotyping and expectations) to use different coping strategies.

Injury Response and Recovery

Injury Response and Recovery Models

Although some athletic injuries may be prevented through increased awareness of psychological risk factors and through interventions to manage those risk factors, there is an inherent risk of injury with regular participation in sport. When excessive forces are placed on the human body, the weakest point of the chain will give, and most often it involves the structures of the human body, leading to athletic injury. Therefore, since injury is an expected part of sport participation, addressing how athletes respond to injuries, both favorably and unfavorably, will help athletic trainers and other sport professionals tip the balance toward a favorable response. Most often, the focus of athletic trainers and sports medicine personnel is on favorable behavioral responses and physical outcomes, including immediate reporting of the injury to appropriate personnel, compliance with treatment and rehabilitation plans, and full return to competition. However, it is also beneficial to address how psychological, sociocultural, and biological factors may influence both athletes' emotional and behavioral responses following athletic injuries.

Addressing the psychological responses to sport injuries and recovery involves identifying how personal and situational factors may influence athletes' cognitive appraisals of injuries, along with their emotional and behavioral responses. In addition, it may also involve identifying how athletes' responses to injuries impact their overall psychological well-being, which in turn may influence athletes' compliance and adherence to treatment and rehabilitation programs. In addressing psychological responses to sport injury, three general types of approaches have been proposed, including stage models, cognitive-appraisal models, and the biopsychosocial approach. These approaches have been borrowed from other psychological domains and modified to work within the context of sport injuries.

Stage Models

The initial research in the area of psychology of sport injury involved the use of stage models. These models suggested a linear progression through a number of stages leading to an indicated outcome. Some of the first discussions involving the psychological response to athletic injury used Kubler-Ross' (1969) five stages of grief model that was developed based on clinical experiences with terminally ill patients. Based on this model, it was proposed that experiencing a physical injury during sport participation involved similar losses as those experienced with a loss of health from terminal illness. However, Morrey, Stuart, Smith, and Wiese-Bjornstal (1999) and Rose and Jevne (1993) suggested there are likely differences in the experiences of athletes who experience temporary physical disability due to injuries and those experiences of patients with terminal illnesses. The application of Kubler-Ross' model to injury response indicates that all injured athletes experience a sequential and predictable progression

through the five stages of grief, including denial, anger, bargaining, depression, and acceptance on the way toward positive adjustment (Brewer, 1994).

Support for the model has been found. For example, researchers have found athletes' psychological responses to injury tend to become more adaptive as time passes following the injury (McDonald & Hardy, 1990; Smith, Scott, O'Fallon, & Young, 1990). Yet, Silver and Wortman (1980) found no substantial evidence supporting the belief that there is a stage-like pattern of psychological response to injury. The major problem of the stage-based models is that they do not acknowledge individual differences in emotional reactions to sport injuries (Brewer, 2001). In general, the stage models ignore individual and situational differences that may influence psychological responses to injury. Therefore, subsequent models have been developed to better explain the psychological response to athletic injury to begin to address the individual differences seen in cognitive and behavioral responses to injury.

Cognitive Appraisal Models

Cognitive appraisal models have been developed to address psychological responses to sport injuries. Based on the work of Lazarus and Folkman (1984), cognitive appraisal models have also been developed relating to athletes' responses toward athletic injury. Through these models, there is an emphasis placed on the influence of personal and situational factors in athletes' appraisals of injuries and their behavioral and emotional responses to those injuries. However, the focus of these models is on the individual's cognitive appraisal of the situation (i.e., injury). In other words, how the individual interprets and appraises an injury determines how the individual will react emotionally and behaviorally. This review will discuss the basic stress process model (Weiss & Troxel, 1986), the four-phase risk model (Rose & Jevne, 1993), the integrated

model response to sport injury (Wiese-Bjornstal et al., 1998), and the biopsychosocial model of sport injury rehabilitation (Brewer, Andersen & Van Raalte, 2002).

Basic Stress Process Model

Weiss and Troxel (1986) proposed a basic stress process model related to the psychological response to athletic injuries, where injury is viewed as a stressor that consequently prompts cognitive appraisal. Specifically, the first phase of their model involves the occurrence of the injuries. Phase two then follows involving the cognitive appraisal of the injury. During cognitive appraisal, athletes attempt to determine the severity of the injuries and assess whether the injuries are significant enough to keep them from participating and require the seeking of medical attention. During this phase, athletes also determine whether they have the necessary coping abilities and resources to deal with the injuries they have experienced and also judge the expected outcome based on their successful or unsuccessful ability to cope with the injuries.

Following cognitive appraisal is the third phase of the model, which involves athletes' emotional responses to the injuries. For some athletes, this phase may involve anger and frustration as they realize the injuries are going to keep them out of the big game or potentially end their athletic careers. For other athletes, the injuries may actually be viewed positively as a way out of the sport that the athletes were being pressured to play by their parents or as an acceptable exit from a poor performance. How athletes perceive and interpret the injuries through the cognitive appraisal phase influences how athletes emotionally respond to the injuries (phase three), as well as how they behaviorally respond to the injuries (phase four). In the case of acute injuries, athletes who really want to participate or may feel they have something to prove may be more likely to try to walk off the injuries and continue to play, while athletes who perceive

the injuries as a way out may be more likely to stay down or immediately seek assistance from appropriate medical personnel. In addition to the progression through the four phases of the model, it is also suggested that during the injury recovery process, there is continual re-appraisal and returning to phase two, which in turn influences continual changes to athletes' emotional and behavioral responses.

One of the strengths of this model is that it begins to explain the individual differences found in athletes' responses to injury with the cognitive appraisal component of the model. It suggests that how athletes perceive injuries influence how they respond both emotionally and behaviorally to the injury. Yet, the model did not identify factors that may lead to the differences in cognitive appraisal by athletes. This model provided a guiding framework for additional models by building on the concept of cognitive appraisal and identified additional factors that may influence athletes' perceptions of injuries.

Four-Phase Risk Model

Rose and Jevne (1993) used qualitative inquiry in the development of their 4-phase risk model of the psychosocial process associated with moderate to severe athletic injuries. The first phase of Rose and Jevne's (1993) model involves the onset or occurrence of the injury followed by phase two consisting of the acknowledgement of the injuries. During this second phase, the authors described a continuum of interpretation regarding the severity of injuries ranging from misinterpretation and denial to accurate interpretation and acceptance. A misinterpretation of the severity of the injuries by athletes during this phase leads to minimal *acknowledgment* of the injuries and also leads to the potential denial that the injuries have occurred. The authors characterized this response as "ignoring or hoping it would go away on its own" (Rose & Jevne, 1993, p. 320). This is commonly seen in the real world of sport as athletes attempt to literally

“shake off” the hand injury or attempt to “walk off” the ankle sprain in order to continue to play. On the other end of the interpretation continuum is accurate interpretation of the severity of the injuries and involves an acknowledgment and acceptance of the injuries. At this end of the continuum, athletes recognize the seriousness of the injuries and likely also recognize the need for appropriate management and treatment of the injury. This acknowledgement and acceptance that the injuries have occurred and seeking of appropriate medical care promotes the proper management of the injuries and also minimizes risk of experiencing further injury.

With the extremes of the continuum involving misinterpretation and accurate interpretation, it was also suggested there is the presence of an intermediate element involving bargaining. Within the bargaining component Rose and Jevne’s (1993) injury risk model, it is believed that athletes are likely to do what is necessary to allow for continued participation in events. This bargaining may involve modification of training schedules or loads to allow for continued participation in games or competitions. Frequently, this response comes from a belief or mentality that the key player at 75% is still better than the back-up player at 100%. The injured player then becomes known as a “gamer”, which is often seen in today’s sport settings. The final two stages of this model involve dealing with the impact of the injury through the physical and psychosocial outcomes of the injury. The physical outcome of the injury may range from full return to activity to withdrawal from participation, while the psychosocial outcome also works across a continuum of psychosocial functioning.

Lastly, the model proposes that throughout the injury to recovery process athletes learn lessons that will influence how they respond to injuries in the future. However, the authors found through their qualitative work that athletes choose to act on

or ignore the lessons learned. Ignoring the lessons may involve forgetting or deliberately ignoring the lessons from the injuries experienced (Rose & Jevne, 1993). It was suggested that these athletes therefore have an increased risk of injury. Athletes who act on the lessons learned were thought to take preventative action to minimize the risk of further injury by performing proper warm-up activities and may not delay seeking out medical care when injured in the future. These athletes were also found to be compliant with prescribed injury management and rehabilitation programs. Overall, athletes that chose to act on the lessons learned decreased their risks of injuries.

Although the Rose and Jevne model (1993) did provide a unique way of looking at athletes' responses to injury, it has not received a significant amount of attention in the literature. Rather, there has been a focus on the cognitive appraisal component within injury response. The remaining two models discussed in this section are the most commonly sited models related to sport injury response today.

Integrated Model of the Psychological Response to Sport Injury

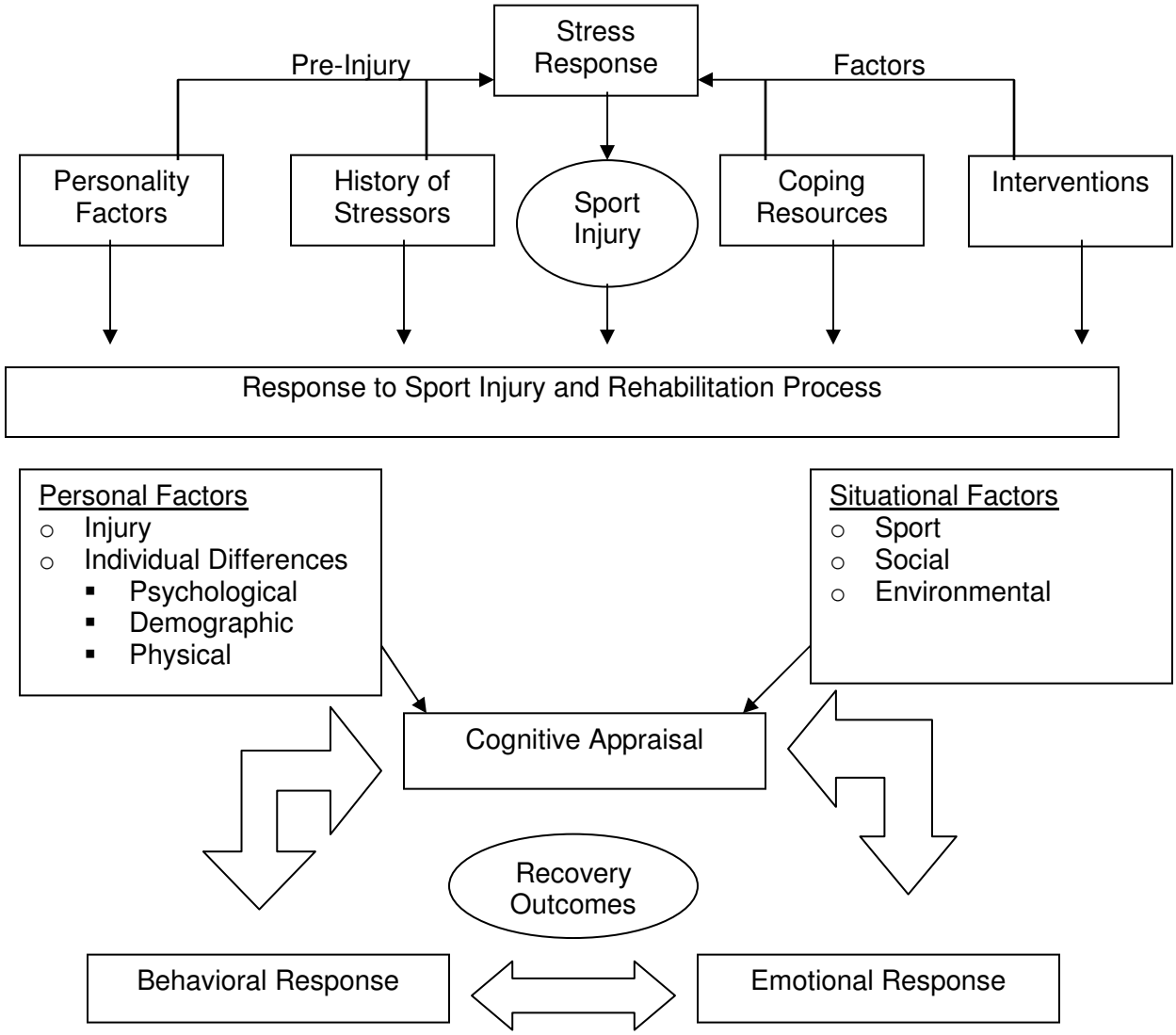
In response to the increased attention to the psychological response to athletic injury, Wiese-Bjornstal et al. (1998) developed an integrated model of the psychological response to sport injury from both the psychological and sociological perspectives. (See Figure 6.) The integrated model added to the model proposed over a decade earlier by Weiss and Troxel (1986) by identifying specific personal and situational factors that may influence an athlete's cognitive appraisal of sport injury in greater detail. The integrated model suggests that the factors that influence athletes' increased risk for experiencing injuries may also influence athletes' responses to injuries; thus, pre-injury factors and post-injury factors are integrated in the psychosocial response to injury. The pre-injury factors include personality, history of stressors, coping resources, and interventions, as

was proposed in Williams and Andersen's (1998) model.

However, Wiese-Bjornstal et al. (1998) addresses how personal and situational factors may influence cognitive appraisal of injury, and in turn influence emotional responses and behavioral outcomes following injury. The personal factors include factors specifically related to the nature of the injury (e.g., injury history, type of injury, severity of injury), psychological characteristics (e.g., personality, self-motivation, athletic identity), demographic information (e.g., gender, age, ethnicity), and physical factors (e.g., physical health status and presence of disordered eating patterns). It is proposed through the model that these personal factors, in combination with situational factors, influence athletes' cognitive appraisals of injury and subsequent emotional and behavioral responses to injury.

Situational factors identified in the model included factors related to the sport itself (e.g., type of sport, level of competition, time in season), social factors related to the current situation (e.g., the sport ethic/philosophy along with influences of family, teammates, coaches, and sports medicine personnel), and environmental factors (e.g., rehabilitation environment and accessibility to rehabilitation). The general premise of the model is that the personal and situational factors directly influence cognitive appraisal. In turn, cognitive appraisal (e.g., goal adjustment, beliefs and attributions, cognitive coping) influences emotional responses (e.g., fear of unknown, anger, depression, frustration, positive outlook) and behavioral responses (e.g., rehabilitation adherence, use of psychological skills training strategies, effort and intensity). For example, if a negative cognitive appraisal occurs involving beliefs about future negative outcomes, a negative emotional response will likely result (e.g., anger, frustration) followed by negative behavioral response (e.g., non-compliance in rehabilitation, etc.).

Figure 6: Integrated Model of Response to Sport Injury (Wiese-Bjornstal et al., 1998)



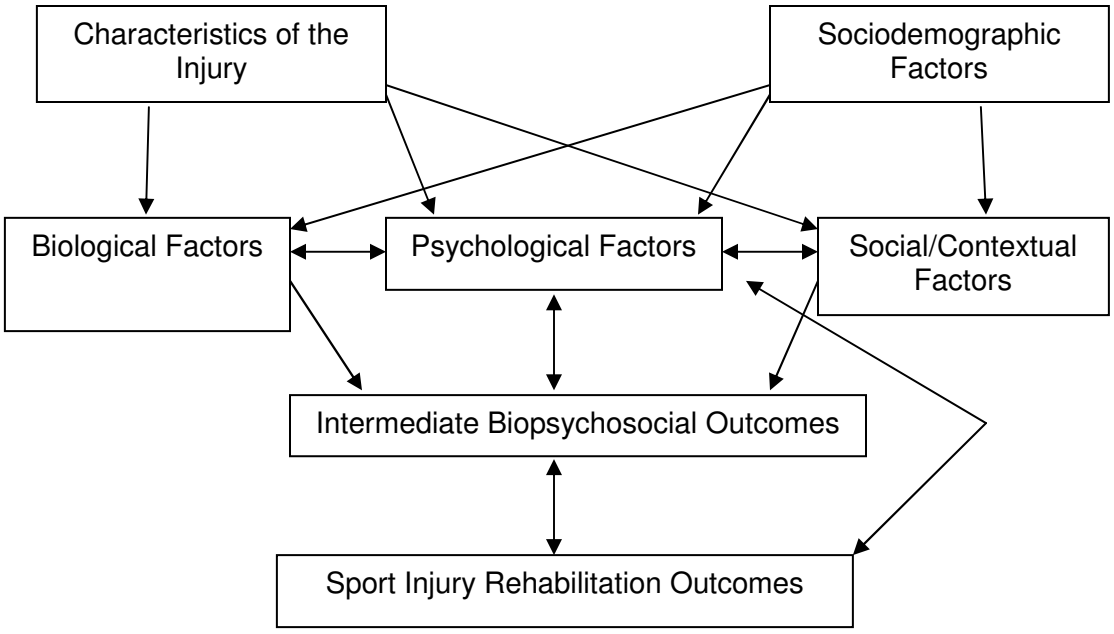
Biopsychosocial Model

While the integrated model by Wiese-Bjornstal et al. describes the relationship of personal and situational factors with cognitive interpretation and emotional and behavioral outcomes, it does not address factors related to injury rehabilitation processes and outcomes. Therefore, the biopsychosocial model was proposed as a four-tier model of factors influencing injury rehabilitation in sport, starting at injury occurrence and progressing to injury rehabilitation outcomes (Brewer, Andersen, & Van Raalte, 2002). (See Figure 7.) The first tier of the model represents factors related to injury characteristics and sociodemographic factors. The specific characteristics of the injury include factors related to the injury, including the type of injury, expected course of the injury, severity of the injury, etc., while the sociodemographic factors include characteristics related to age, gender, race/ethnicity, and socioeconomic status. The model does not indicate a relationship between these two factors, but it does suggest injury characteristics and sociodemographic factors influence each of the three second tier components.

The tier two factors include biological factors, psychological factors, and social/contextual factors. Psychological factors include characteristics related to personality, cognition, affect, and behavior; they also serve as the central component of the second tier. Biological factors (e.g., sleep, nutrition, metabolism) and social/contextual factors (e.g., social networks, life stress, situational characteristics) are both shown to have a reciprocal relationship with psychological factors and a direct relationship with the tier three factor, intermediate biopsychosocial outcomes. The biological factors, psychological factors, and social/contextual factor are all shown to influence intermediate biopsychological outcome with personality factors also being

influenced by intermediate biopsychological factors. The intermediate biopsychological outcomes include aspects of recovery, such as range of motion, strength, and rate of recovery. The fourth tier of the model is comprised of sport injury rehabilitation outcomes and is shown to have reciprocal relationships with both psychological factors and intermediate biopsychological outcomes. The sports injury rehabilitation outcomes include factors related to functional performance, quality of life, and treatment satisfaction.

Figure 7: Biopsychosocial Model of Sport Injury Rehabilitation (Brewer et al., 2002)



Psychological Response to Sport-Related Injury

The models describing the relationship of stress and health, injury risk, and injury response have provided a framework to conceptualize and begin to analyze the different roles psychological and social factors may play throughout the injury-recovery process.

A number of physical and psychological factors affect psychological response to sport injury. Most of the research addressing the psychological response to injury has focused on direct associations between various personal and situational factors and emotional and behavioral responses to injury, rather than the potential mediational effect (Brewer & Cornelius, 2003). Only indirect support has been found suggesting the mediational role of cognitive appraisal (Brewer & Cornelius, 2003). To date, the majority of the research addressing psychological response to injury has been based on the Wiese-Bjornstal et al. (1998) integrated model. Therefore, relevant research related to the primary components of that model, personal factors, situational factors, cognitive appraisal, and emotional and behavioral responses are discussed.

Personal Factors

The personal factors identified in the Wiese-Bjornstal et al. (1998) integrated model include factors related to the nature of the injury (e.g., injury history, type of injury, severity of injury) and individual differences, including psychological characteristics (e.g., personality, self-motivation, athletic identity), demographic information (e.g., gender, age, ethnicity), and physical factors (e.g., physical health status and presence of disordered eating patterns). It is believed these personal factors work with the situational factors to influence athletes' cognitive appraisals of injuries, which in turn influence emotional and behavioral responses to injuries.

Prior experiences with injury, as well as characteristics of the current injury and perceived cause of injury, comprise the first component of personal factors. Research has found a negative relationship between perceived recovery status and mood disturbance in severely injured athletes (Smith, Scott, et al., 1990; Smith, Stewart, Wiese-Bjornstal, Milliner, O'Fallon, & Crowson, 1993). Crossman and Jamieson (1985)

found that an overestimation of injury severity related to reports of more pain, higher state anxiety, and greater feelings of anger, apathy, loneliness, and inadequacy. Alzate, Ramirez, and Lazaro (1998) found a positive relationship between post-injury emotional disturbance and current injury status and injury severity. Smith et al. (1993) found injury severity based on time loss to be a significant predictor of post-injury depression.

The second component of personal factors seen as influencing psychological response to injury includes individual differences. These individual differences are broken into psychological differences, demographic differences, and physical differences. Personality characteristics are included within the psychological difference grouping and have been addressed in both their role of injury occurrence and also their role in response to injury. Grove (1993) found a relationship between the personality characteristics of pessimistic explanatory style, dispositional optimism, and hardiness. It was found that patients with a pessimistic explanatory style reported the highest levels of depression during the first month of rehabilitation for anterior cruciate ligament (ACL) injuries.

Athletic identity is another construct within the individual psychological differences. Athletic identity represents the degree to which individuals identify themselves with their roles as athletes (Brewer et al., 1993). Research has found positive and negative consequences related to strong identification as an athlete. An athlete whose self-identity is based solely on their role as an athlete has been shown to adhere to significant training programs, which often results in improved performance (Danish, 1983). However, other research has found athletes who exhibit this same strong identification as athletes commonly experience difficulties in dealing with injuries, career transitions, and athletic career termination (Pearson & Petitipas, 1990). With a

strong identification as an athlete, an injury may be seen as a threat to their whole being. Brewer (1993) found a positive relationship between athletic identity and depressed mood following injury. Athletes who identify themselves more strongly with their athlete roles experienced more depression when injured than did athletes who did not identify themselves as strongly as athletes. Hartman-Nippert (2005) supported this finding by reporting that older, varsity-level gymnasts were more likely to continue participation in their sport when injured if they had high athletic identity and task orientation. In addition, the author found gymnasts' internal drive to participate and external influence of teammates and the media had a greater influence on their willingness to play while injured than external influences of parents, coaches, and medical professionals. Athletes are often their own worst enemies, not only when it comes to setting high performance expectations, but also when appraising pain and injury and setting expectations for what they should play through.

Although athletic identity has been shown to have both positive and negative influences in athletes' responses to injury, it remains a key component in this investigation. For this investigation, athletic identity was linked with the sport ethic, or the belief system by which athletes' work regarding the sacrifices and dedication needed to be considered and remain athletes. Danish (1983) reported that the dedication athletes exhibit within their training programs can lead to positive outcomes, such as improved performance. This approach would be consistent of those athletes who conform to the sport ethic. Yet, Hartman-Nippert (2005) found that gymnasts with high identification as athletes were more likely to continue participation in sport when injured, placing them at risk of experiencing further injury. This approach may begin to delve into the overconformity to the sport ethic that is discussed in the following section.

Other personal factors believed to affect cognitive appraisal of athletic injury include trait anxiety, self-esteem, self-motivation, coping skills, extraversion, neuroticism, psychological investment in sort, and injury history. Of these, competitive trait anxiety (Petrie, Brewer, & Buntrock, 1997), investment in playing professional sports (Kleiber & Brock, 1992), level of sport involvement (Meyers, Sterling, Calvo, Marley, & Duhon, 1991), and previous injury history (Bianco, Malo, & Orlick, 1999) have been shown to have a positive relationship with post-injury emotional disturbance. Negative relationships have been found between post-injury emotional distress and age (Brewer, Linder & Phelps, 1995) and hardiness (Grove, Stewart, & Gordon, 1990). Meyers, et al. (1991) found participants between the ages of 20 and 39 reported greater levels of emotional disturbance than younger participants (10-19 years) and older participants (40-49 years). Therefore, athletes who are "young, least hardy, most strongly identified with their athlete role, most dispositionally anxious, most invested in having a career as a professional athlete, most experienced in the rigors of sports injury rehabilitation, and most pessimistic" tend to have the greatest difficulty in emotionally adjusting to injury (Brewer & Cornelius, 2003, p. 166).

Significant positive relationships have been found between post-injury emotional disturbance and recovery progress (McDonald & Hardy, 1990), social support during rehabilitation (Fisher, Domm & Wuest, 1988), and impairment of sport performance (Brewer, Andersen, & Van Raalte, 1992). Negative relationships have been reported between post-injury emotional disturbance and injury severity (Pargman & Lunt, 1989; Smith, Scott, et al., 1990), impairment of daily activities (Crossman & Jamieson, 1985), and life stress (Brewer, 1993).

Several personal factors have been linked to adherence to injury rehabilitation programs. Self-motivation (Duda, Smart, & Tappe, 1989), task involvement (Duda, et al., 1989), pain tolerance and perceived exertion (Fisher, et al., 1988) have been shown to have positive relationships with better rehabilitation adherence. Patients scoring high on the MMPI hypochondriasis and hysteria scores experienced less improvement following knee surgery than low-scoring patients on those scales (Wise, Jackson, & Rocchio, 1979). Shaffer (1992) found a positive relationship between rehabilitation self-efficacy and joint functioning over the course of rehabilitation for athletes with ankle sprains. In addition, LaMott (1994) found greater range of motion differences between the injured and uninjured knee following knee reconstruction were linked with greater anger, pain, fear, frustration, and pessimism. Grove, Stewart, and Gordon (1990) found an increase in depression and anger across the rehabilitation process in pessimistic athletes.

Situational Factors

A number of situational factors are also believed to influence cognitive appraisal and emotional response following injury. Three categories of situational factors are identified in Wiese-Bjornstal et al. (1998) model, including sport factors, social factors, and environmental factors. Sport factors can include factors such as type of sport, level of participation, time in season, playing status, and whether the injury occurred during practice or a game. Social factors within the model included addressing social dynamics involving family, coaches, teammates, and sports medicine personnel, as well as the influence of the overarching sport ethic. Environmental factors identified include the rehabilitation environment and accessibility to rehabilitation.

The majority of psychological response to injury research has addressed the personal factors. However, a few researchers have addressed situational factors and have reported significant findings. Specifically, impairment of sport performance (Brewer, Linder, et al., 1995), level of sport performance (Crossman, Gluek & Jamieson, 1995), social support for rehabilitation (Brewer, Linder, et al., 1995) and social support satisfaction (Green & Weinberg, 1998; Petrie, Falkstein & Brewer, 1997) have been shown to be negatively associated with emotional disturbance following injury. Morrey (1997) found that competitive-level athletes experienced greater mood disturbances during their return to participation following ACL reconstruction than did recreational-level athletes.

Although situational factors have been identified in previous literature and in the models regarding psychological response to athletic injury, research addressing their roles in the psychological response to injury is limited. One area that has received some attention is the role of the sportsnet, coaches, teammates, and sports medicine personnel, in athletes' responses to injury (Nixon, 1994b). Social influences within the key members within the sport network can also play a significant role in athletes' emotional and behavioral responses to athletic injury. Nixon (1994b) reported approximately two-thirds of the athletes in his investigation reported having avoided coaches or attempted to hide their pain and injuries from their coaches when they were hurt. In addition, nearly half of the athletes reported feeling pressure from their coaches to play hurt. Peers and teammates can also put pressure on other teammates to participate in sport while in pain or while injured. Nearly half of the athletes surveyed reported trying to avoid or hide injuries from teammates, and 40% felt pressured by teammates to play hurt (Nixon, 1994b). Nixon (1994b) reported the greatest determinant

in whether an athlete will report injury to an athletic trainer was found to be the athletic trainer's expression of sympathy or caring about the pain and injury being reported. Yet, Lewis and LaMott (1992) found that professional football players indicated coaches and athletic trainers were less supportive than other support providers examined. This research suggests that although there is potential for sports medicine personnel to impact athletes' physical and psychological well-being following athletic injury, there is room for improvement.

Another social aspect that may influence athletes' responses to injuries and the primary focus of the current investigation is the sport ethic. Athletes are often socialized into the culture of sport that emphasizes achievement at any cost. Wiese-Bjornstal et al. (1998) identified the sport ethic as one of the social components within the situational factors that influence cognitive appraisal within the integrated model. In addition, it is suggested that addressing the role of the sport ethic in the psychological response to injury is critical and needs to be considered by sport psychology researchers investigating the psychological consequences of sport injury (Wiese-Bjornstal el al., 1998). To date, the majority of the literature regarding the sport ethic has come from sport sociology literature. Specifically, Hughes and Coakley (1991) identified four criteria that are seen as necessary to be identified and treated as an athlete. These critical criteria include the willingness of athletes 1) to make sacrifices for the game, 2) to continually strive for distinction, 3) to accept risks and express a willingness to play through pain, and 4) to refuse to accept limits in the pursuit of possibilities. Limited research has addressed the role of the sport ethic in athletes' responses to pain and injury, the key focus of this investigation.

It is believed that all athletes adhere to the same sport ethic. Young, White, and McTeer (1994) found athletes in over 20 sports reported a willingness to conceal pain in order to continue to participate in their sport. These sports ranged from high jumping and downhill skiing to the expected high contact sports of football and ice hockey. To date, research has not found a difference in the degree to which male and female athletes comply with the rules of the sport ethic. Young and White (1999) found that male and female athletes adopted similar techniques in addressing pain and injury associated with their sport participation. They reported that male and female athletes typically addressed pain and injury with four common themes: hiding the pain (keeping the presence of pain and injury from others), disrespecting the pain (differentiating pain from injury and willingness to play through it), unwelcoming the pain (view pain as a distracter or demoralizer for the team), and depersonalizing the pain (referring to the injured part as separate from the person). These tendencies in dealing with pain and injury allow athletes to continue to participate despite their discomforts and allow them to live up to the expectations of the sport ethic.

Messner (1992) identified external pressures and internal threats to masculine identity as primary reasons to risk injury. These external pressures and internal drives can lead to athletes choosing to play hurt. “In many of our most popular sports, the achievement of goals (scoring and winning) is predicted on the successful utilization of violence, that is, these are activities in which the human body is routinely turned into a weapon to be used against other bodies, resulting in pain, serious injury, and even death” (Messner, 1990, p. 203). The physicality of today’s sporting environment is apparent. The sport culture stresses the importance of making sacrifices in order to be bigger, faster, and stronger than competitors. Often times, this mentality encourages

athletes to play through the pains and injuries they experience and also rewards them when they are willing to endure more than their competitors.

Within the cognitive appraisal models addressing the psychological response to injury, the theoretical framework suggests that personal and situational factors influence athletes' cognitive, emotional, and behavioral responses. The following sections will review previous literature addressing cognitive, emotional, and behavioral responses following injury.

Cognitive Responses

The personal and situational moderators discussed in the previous sections have been shown to positively and negatively influence cognitive, emotional, and behavioral responses to injuries. The cognitive appraisal component of the injury response models involves the mental processes of injured athletes that occur at the initial onset of injury and throughout the injury recovery process. The interrelationship among the cognitive, emotional, and behavioral responses in dealing with athletic injuries is considered to be dynamic in nature. Continual changes in the cognitive response throughout the injury-recovery process lead to concurrent emotional and behavioral changes. Behavioral changes experienced during the process can also influence cognitive and emotional response changes.

Changes in self-perceptions have received a significant focus in addressing cognitive responses to athletic injury and involve the changes in how athletes view themselves. Within sport psychology literature, the most commonly measured components of self-perception include self-esteem, self-worth, self-confidence, and self-efficacy. Chan and Grossman (1988) found significantly lower self-esteem levels in

injured runners than in their non-injured counterparts. Another investigation found significant decreases in global self-worth in injured football players compared to uninjured teammates (McGowan, Pierce, Williams, and Eastman, 1994). However, Smith, et al. (1993) did not find differences when comparing pre-injury and post-injury global self-worth levels in athletes participating in basketball, volleyball, baseball, and ice hockey. Brewer (1993) found physical self-worth predicted post-injury depression in a sample of athletes at a sports medicine clinic. Additional changes were found in pre-injury and post-injury differences in total self-esteem and physical self-esteem in a sample of NCAA Division I male athletes (Leddy, Lambert, & Ogles, 1994). In addition to self-esteem and self-worth, research has addressed the impact of injury on self-confidence and self-efficacy. Self-confidence refers to one's general belief in oneself, while self-efficacy involves the belief in oneself in specific situations. In addressing psychological responses of athletes recovering from ACL surgery, LaMott (1994) found self-confidence increased across time in injured athletes compared to non-injured matched controls. Connelly (1991) found a loss of efficacy involving football skills as a result of injury when comparing pre-injury and post-injury levels.

Coping Responses

Although many athletes start participating in sport for the mere fun and enjoyment of playing the game, continuing to play the game can at times lead to negative psychological stresses and consequences. Constantly needing to perform at a high level and a continual desire to perform at one's best and outperform others can lead to negative psychological consequences for an athlete. Above and beyond this pressure to perform, a physical injury that limits athletes' abilities to perform at this top level can

be perceived as catastrophic, even if the physical injury is only temporary in nature. The impact of such events not only affects the athletes, but will also likely affects those individuals closest to the athletes, including teammates, coaches, and others in the athletes' social network. How athletes deal with the stresses of participating in sport and their abilities to deal with the psychological stresses related to injuries likely influences their behavioral responses following injuries, including their willingness to seek help and follow through with recommended courses of treatment and rehabilitation.

Coping with stress has received a significant amount of attention in general psychology and health psychology literature (Vaillant, Bond, & Vaillant, 1986; Strack & Feifel, 1996). However, little research has addressed stress and coping with respect to competitive athletes. In the sport psychology realm, the majority of the research has focused on pre-injury psychological states and on personal factors that influence athletes' risks for experiencing injuries and athletes' emotional and behavioral responses following injuries. Additional research has addressed psychological responses related to physical rehabilitation compliance (McDonald & Hardy, 1990; Bianco, Malo, & Orlick, 1999), while not addressing the in-between step related to the immediate help-seeking tendencies for the pains and injuries experienced by athletes. McDonald and Hardy (1990) examined affective responses to athletic injury and reported on the importance of athletes accepting the reality of the injury, and of expressing and experiencing the changes in emotions to allow for a smooth transition throughout the recovery process. Bianco et al. (1999) also focused on the acceptance and focus during the rehabilitation process and found that the athletes interviewed identified a variety of cognitive, emotional, and behavioral responses as they progressed through the phases of recovery. The research findings emphasized the importance of maintaining a positive

attitude and approach toward injury and the rehabilitation process and that the belief that they would return to sport was a key force for the elite level skiers returning who had suffered severe injuries or illnesses.

Lazarus and Folkman (1984) define coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). In other words, coping involves the use of cognitive and behavioral resources in an attempt to deal with stressors when they are introduced. Due to the dynamic nature of coping, it is seen as a process that constantly changes throughout one’s exposure to a stressor and addressing the context in which the coping is occurring is essential (Kerr & Miller, 2001). In the case of athletic injury, a variety of coping resources and strategies will likely be used throughout the injury-recovery process as cognitions, emotions, and physical demands of the injury change. The individual, current situation, coping resources available, and nature of the stressor (i.e., injury severity, time of season, etc.) also add to the complexity of the coping response. In general, coping resources can be external to the individual, such as seeking social support, or can occur within the individual, such as implementing emotion and anxiety management skills.

Wethington and Kessler (1991) identified six types of coping strategies, including avoidance, positive reappraisal, religion, active coping, active behavioral coping, and social support. Avoidance involves performing behaviors that take your mind off the given situation, while positive reappraisal involves modifying how one thinks about the given situation in order to reduce distress. Active coping involves thinking about potential ways that the situation can be improved, and active behavioral coping involves doing things to improve the given situation. Lastly, seeking social support, the final type of

coping strategies that have been identified, includes talking to others regarding the given situation.

Coping has two primary functions or objectives based on the focus of the coping resources. One function involves the management and regulation of the situation or issue that is causing the stress, and is referred to as problem-focused coping. Problem-focused coping is described as coping that involves taking action on the stressor to help improve the given situation, thereby reducing the amount of stress experienced (Lazarus & Folkman, 1984). This type of coping generally involves situations in which the person involved has control over the situation. Problem-focused coping for the injured athlete may involve such coping strategies as seeking medical advice regarding the proper management and treatment of the injury, adherence to the prescribed treatment and rehabilitation program, and the setting of goals for rehabilitation and for one's return to participation.

The second function of coping involves an attempt to maintain an optimal level of psychological equilibrium, and is referred to as emotion-focused coping. Emotion-focused coping involves focusing on the person's response to the given stressor or situation through cognitive and behavioral efforts to manage and regulate emotional responses to the stressor (Lazarus & Folkman, 1984). Rather than trying to fix the problem, emotion-focused coping emphasizes how the stressor is viewed and involves making a conscious effort to modify the mental, emotional, and behavioral responses to the stressor. Emotion-focused coping for the injured athlete may involve the seeking of social support to help with the management of thoughts and emotions regarding the injury or may involve the use of cognitive-management strategies, such as thought stoppage, thought reframing, and positive self-talk.

Research has found that personality traits, such as self-esteem and locus of control can influence the use of coping strategies and the effectiveness of those strategies. Individuals with an internal locus of control and high self-esteem have been found to use more problem-focused coping strategies than individuals with an external locus of control and low self-esteem (Kerr & Miller, 2001). Taylor and Aspinwall (1996) found that university students with higher self-esteem levels and increased optimism used higher levels of active coping strategies and were less likely to use avoidance type strategies, such as daydreaming, substance use and abuse, or withdrawal. Stanton and Snider (1993) found optimism to be a predictor of lower levels of avoidance coping among women anticipating a potential diagnosis of breast cancer.

Gender has also been found to influence the use of particular coping strategies. Gilligan (1993) suggested that women are more likely to use expressive styles of coping, including social support seeking tendencies, writing about the situation, and a willingness to express feelings. In contrast, men were found to analyze or critically think through situations and were more likely to accept the situation. Research also supports men's tendencies to not seek help for health related issues. Regardless of age or ethnic and racial background, men have been found to be less likely to seek help than women (Husaini, Moore, & Cain, 1994; Neighbors & Howard, 1987). Men visit their primary care physicians and other medical specialists less often than women (Neighbors & Howard, 1987; Rafuse, 1993). When they do, it is generally a result of the presence of physical symptoms (Moller-Leimkuhler, 2002), and they ask fewer questions than women (Courtenay, 2000). Men have been found to report reluctance to seek even informal help from friends and reported they would never seek psychological assistance for depression (Padesky & Hammen, 1981; Weissman & Klerman, 1977).

Specifically, research has also addressed gender differences in coping with athletic related injuries. Similar to findings with the general population, Henert (2001) found that male athletes use more problem-focused coping and take steps to improve a given situation or problem, while finding it difficult to express their feeling and emotions regarding the injury. Female athletes have been found to use more emotion-focused coping, thereby addressing their emotions related to being injured, which allows them to converge both the physical and emotional recovery from injury. These findings are consistent with general health literature, which indicates that women were more likely to recognize and acknowledge emotional distress issues than men (Kessler, Brown, & Boman, 1981). Females are likely to react differently to the negative feedback they receive from significant others, which may explain their preferences in using emotion-focused coping strategies (Goyen & Anshel, 1998).

Harrison, Chin, and Ficaraotto (1989) suggested that specific behaviors commonly associated with male sex role (masculinity) are those that can be potentially hazardous to men's health, not biological sex. The idea of men acknowledging vulnerability by seeking help goes against the messages regarding the importance of exhibiting the traditional masculine traits. Bem (1974) identified being individualistic, dominant, competitive, and willingness to take risks as some of these masculine traits, while being sensitive to others, understanding, compassionate, and warm were identified as feminine traits. Courtenay (2000) argues that "by dismissing their health care needs, men are constructing gender. When a man brags, 'I haven't been to a doctor in years', he is simultaneously describing a health practice and situating himself in a masculine arena" (p. 1389). Kimball and Freysinger (2003) suggest that women who participate in physically aggressive sports are commonly viewed as unfeminine and having the same

masculine characteristics that may place men at greater risk for not seeking help.

Research has found significant differences in coping strategies used by athletes based on the nature and severity of injury. Wasley and Lox (1998) found chronically injured athletes scored significantly higher on 'escape/avoidance' and significantly lower on 'seeking social support' than athletes with acute injuries. No significant differences were noted on the 'acceptance of responsibility' subscale. The authors concluded that chronically injured athletes exhibit significantly different coping behaviors than athletes who experience acute injuries. In addition, athletes who experience more severe injuries are believed to experience greater psychological and emotional responses and often require greater coping resources than athletes experiencing less severe injuries (Smith, 1996). Grove and Gordon (1995) found that athletes who experienced significant injury that required withdrawal from sport for a period of time tended to initially respond with shock and denial and a false belief that the injury was superficial in nature.

Emotional Responses

Affective responses have received much of the focus of research addressing the psychological response to injury. It is believed that athletes' emotional responses are affected by their cognitive appraisal of the injury, as well as their behavioral responses. Sport injuries have been found to be a significant source of stress and have been found to produce emotional disturbance in athletes experiencing injuries (Brewer & Petrie, 1995). Although the emotional disturbances experienced following injury are not likely to be clinical in nature (Heil, 1993), it is estimated that five to 24% of athletes experiencing sport injury experience clinically significant levels of psychological distress (Brewer et al., 1995; Brewer, Petitpas, Van Raalte, Sklar, & Ditmar, 1995; Brewer & Petrie, 1995).

Injury severity has been found to be a significant predictor of post-injury depression among male and female competitive athletes who experience acute injuries (Smith, et al., 1993).

As discussed in previous sections, personal and situational factors have been shown to influence emotional disturbance in athletes following athletic injury. Beyond initial emotional disturbances, post-injury feelings have been shown to change over time throughout the injury and recovery process. McDonald and Hardy (1990) and Smith, Scott, et al. (1990) found changes in mood disturbance corresponded with athletes' perceptions of recovery during the six to 12 weeks following the injury. In monitoring ACL injured athletes over the course of three and six months, LaMott (1994) and Morrey (1997) noted an inverted-U pattern of mood disturbance during recovery. They found elevation in negative mood scores at the first interval, but found steady decreases during the second and third intervals, and increases in disturbance when entering the fourth interval of evaluations. Professionals working with injured athletes should not assume that all injured athletes will experience mood disturbance following injury. Smith, Scott, et al. (1990) found significant mood disturbance only in athletes who had experienced serious injury, and they reported mild to moderately injured athletes showed less mood disturbance than norms for non-injured college students.

Behavioral Responses

How athletes behaviorally respond to injury is influenced by their thoughts and feelings about the injury. Coping mechanisms and adherence to treatment and rehabilitation programs are commonly studied in athletes' behavioral responses to injury. Coping mechanisms may include accepting that the injuries have occurred and actively seeking help to manage, treat, and rehabilitate the injuries. Others may deny the injuries

have occurred and continue to participate, while actively hiding their injuries from others. Heil (1993) describes that athletes with poor adherence may be more somatically anxious, have psychological adjustment problems, be less confident about the proposed treatment, lack a sense of social support, be less self-motivated, and be less goal-oriented. On the other hand, athletes' perceptions of the importance of particular therapeutic treatments, expectations for positive outcomes, beliefs that the benefits of rehabilitation will outweigh the costs, and perceptions of active involvement have been shown to promote rehabilitation adherence following injury. It is likely that the personal, social, and physical factors previously discussed to influence injury risk and injury response also influence rehabilitation adherence.

Kerr and Miller (2001) suggest that researchers must examine the broader context of the sport ethic when investigating coping responses following injury. Nixon (1994a, 1994b) found that many athletes report playing while injured, report they return to sport participation prior to full physical recovery, and report being exposed to significant pressures from coaches, teammates, and athletic trainers to participate in their sports while injured. This acceptance of physical risk has been identified as a key component in many experiences of male athletes who are willing and even encouraged to participate in their sports while injured (Young & White, 1995). They found disassociative strategies were commonly employed to deal with injury, including denial that an injury has occurred, disregarding and depersonalizing the pain and the injured body part. In addition, female athletes who were also willing to expose themselves to the risk and injury involved in sport participation and who were also exposed to pressure to play aggressively or while injured were found to use disassociative strategies similar to their male counterparts (Young et al., 1994).

Together, it is believed that personal and situational factors influence athletes' cognitive appraisals of injury, which influence athletes' emotional and behavioral responses. How athletes appraise injuries and their abilities to cope with injuries influence how athletes emotionally and behaviorally respond. Although addressing particular components of the puzzle is important, it is equally important to address the potential for interaction among a number of factors.

The focus of this investigation is to begin to address the role of the sport ethic, particularly the toughness component, on athletes' willingness to seek help for the pains and injuries experienced during participation in sport. Although there are a number of additional coping strategies that may be addressed, help-seeking is the central coping focus of this investigation. It is believed that although athletes may find additional ways to successfully and unsuccessfully deal with the pains and injuries associated with sport, such as denial, avoidance, venting, etc, ideally it is important for athletes to seek professional medical help to aid them in determining the severity and potential long-term consequences of playing through the pain and injury. Oftentimes, athletes may not be able to accurately recognize or may not be willing to acknowledge the severity of the injury. And even when they do recognize and acknowledge the injury is present, they may choose to deny or downplay its presence in order to continue to participate in sport. The following section will discuss literature regarding the normalization of pain and injury in sport, the sport ethic, and the risk of overconformity to the sport ethic.

Normalizing Pain and Injury in Sport

When watching athletes participate in sport, it does not take long to see to what extreme degree some athletes are willing to place their bodies in harms way in the name of sport. In addition to personal factors such as identification as an athlete, athletes are socialized from their days in youth sport that pain and injury are to be expected from participating in sport. Through their participation, athletes learn to rationalize injuries as expected components of the game, and uphold their ability and willingness to play with pain as character development and as a way to gain the needed respect of others involved in their sporting world (Messner, 1990). Pain and injury are commonly seen as the price to be paid by athletes for their opportunity to play the sports they love.

Conceptually, the idea of athletes' willingness to play through pain has received more attention in the sport sociology literature than sport psychology literature. The idea that athletes are willing to sacrifice their bodies by playing through pain or by taking other substances that allow athletes to play despite injury has been addressed as one part of deviance in sport (Coakley, 2007). Deviance is defined by Coakley (2007) as an "action, trait, or idea that falls outside a range of acceptance as determined by people with the power to enforce norms in a social world". Studying deviance in sport has been described as being difficult since problems specific to the sport culture often arise. For example, certain behaviors that are accepted within the sport setting may be seen as deviant in other areas of society, and actions viewed as acceptable in society may be viewed as deviant in sport (Coakley, 2007). The norms, or expectations placed on those within a culture, in sport are often different from those accepted norms in other domains. Specifically, athletes who are willing to risk their health and well-being and inflict pain on others are often praised within the sport setting, while outside the sport setting, the same

behavior would be considered deviant and unacceptable (Coakley, 2007). Persons in power often take action to control deviant underconformity, or those who ignore or reject the norms, often through the use of punishment, while those athletes who actually exhibit deviant overconformity are often praised for their willingness to accept the norms and follow them to extreme levels (Coakley, 2007).

Another issue that arises in studying deviance in sport involved the often "unquestioned acceptances of norms, rather than rejection of norm" (Coakley, 2007, p.154). Rather, the sport culture often encourages athletes to perform excessive behaviors and actions that promote the ideals of sport, including commitment and dedication. Within a variety of sports, Nixon (1996a) found athletes expressed similarity in toughness and in regards to choices made about enduring risk, pain, and injury, regardless of the nature of the sport activity. Athletes responded comparably whether they participated in team and individual sports or contact and non-contact sports. Nixon (1996a) concluded from his findings that "the pervasiveness and normalcy of pain and injury experiences in all kinds of sport may explain why the structure of the sport did not affect athletes' pain and injury attitudes or experiences" (p.41). These findings representing a variety of sports suggest that the sport ethic and mentality that pain and injury are inevitable when participating in sport are universal across sport.

The culture and social system within which athletes perform places a significant emphasis on athletes' willingness to make physical and mental sacrifices and on their abilities to exhibit toughness. Despite the positive view of these characteristics within the context of sport, the characteristics can also have a negative impact on athletes when athletes become unwilling to stop participation regardless of pain and injury (Wiese-Bjornstal, 2000). Many athletes learn very early in their athletic careers that risk of pain

and injuries is present as a result of their participation in the activity. Athletes also commonly learn they need to play hurt and play through the pain to be successful at being athletes and to maintain their memberships in the “athlete” club. Whether it is a coach telling the athlete that he or she just needs to “tough it out”, or teammates praising one another for being willing to “take one for the team”, athletes learn from the very beginning that being “tough” is a trait that is viewed very highly by those in the sporting community. “As athletes are socialized into sport, this normative ethic provides the framework within which they learn to define sacrifice, risk, pain, and injury as the prices that must be paid to be competitive athletes” (Wiese-Bjornstal, 2000, p. 60). Not only are athletes taught they need to make sacrifices and accept risks, they are also taught guilt, shame, and uncertainty regarding their position on the team may be associated with athletes who complain about pain and injuries, regardless of the severity or nature of the injury (Nixon, 1993).

Risk of Overconformity to the Sport Ethic

One way in which athletes show deviance in sport involves the norms associated with the sport ethic. The components of the sport ethic were identified as the “normative core of high-performance sport culture” (Coakley, 2007, p. 161). Hughes and Coakley (1998) found these four prevalent norms encompassed by the sport ethic consist of the following:

1. Exhibits dedication to the game above all other things,
2. Strives for distinction,
3. Accepts risk and plays through pain, and
4. Accepts no obstacles in the pursuit of possibilities.

The authors concluded that within the culture of sport, as long as athletes are willing to stay committed to the sport ethic and do not question the degree to which they abide to the rules of the sport ethic, athletes will do and try whatever they can to continue participation in sport, often times leading to deviant overcomformity. Athletes are willing to pay this price and make the necessary sacrifices in order to be live up to the expectations placed on them when they consider themselves as athletes (Coakley, 2007). These athletes will do what they need to do in order to show others they belong in the athletic fraternity by being willing to pay the price, strive for distinction, accept risks, and exceed limits. They live up to the rules of the sport ethic; no questions asked.

Oftentimes, athletes are willing to make these sacrifices even if their future health is placed into question. For some athletes, making the necessary sacrifice may simply mean playing with a little discomfort and for other athletes it may require playing through excruciating pain. Some athletes may use non-prescription and prescription medications in order to allow them to make it through a practice or game (Hughes & Coakley, 1991). Hughes and Coakley (1991) also suggest that some athletes take their sacrifices to an even greater extreme by enduring repeated surgeries for one more chance to play or as a result of having played while injured. Many athletes make these sacrifices without consideration of the long-term consequences of their actions. Although many people believe that athletes make these sacrifice for the rewards they receive from playing such as money or the joy of winning, for many athletes “it is simply to play, to be an athlete, and maintain their membership in the special and elite athletic fraternity” (Hughes & Coakley, 1991, p. 314).

In the more physical sports such as football and ice hockey, it is common for athletes to be rewarded not only for their willingness to endure personal discomfort and

pain, but also for their willingness to inflict discomfort and pain on others. When athletes choose to no longer make these sacrifices, their masculinity may come into question and the athlete may no longer be accepted within the sport culture (Messner, 1990; Young et al., 1994). For some athletes, this ridicule and questioning by their peers may be more damaging for the athlete than the physical injury itself. Two characteristics have been identified that make athletes more likely to overconform to the sport ethic (Hughes & Coakley, 1991, p.312), including the following:

1. Those athletes who have low self-esteem or who, for other reasons, are vulnerable to group demands and less able to withstand pressures to sacrifice themselves for the group.
2. Those athletes who see sport as an exclusive mobility route, and for whom mobility demands an extreme commitment to achievement and a willingness to make great personal sacrifices as they strive for achievement.

The authors suggested sport culture, which uses the degree to which athletes abide by the rules of the sport ethic as a determinant of athletes' commitment and courage, plays into the hand of those who emphasize the entertainment and business side of sport, not for those looking out for the health and well-being of the athletes (Hughes & Coakley, 1991). Therefore, it is suggested that coaches whose own careers are dependent on whether their starting player is able to play on Sunday will not need to pressure the player to play regardless of pain or injury. The athletes likely put more pressure on themselves to not let their coaches and teammates down than anyone else can place on them.

How athletes perceive pain and injury comes from their early socialization regarding playing with pain. Choosing to participate in sport while injured and risking potentially life-threatening or career-ending injury has been described as within the gendering of injury. “This ultramasculine gesture is accorded even greater status if by returning to action the athlete puts himself at risk to be permanently disabled if he is reinjured” (Young et al., 1994, p. 191). When athletes are praised for their willingness to play with pain, this reinforces the behavior and athletes are likely to continue that behavior, often regardless of the severity of injury. Athletes who are unwilling to make the sacrifice are believed to not have sufficient disrespect for pain and may be perceived as soft or feminine (Young et al., 1994).

Athletes are trained, not only physically, but also mentally to accept certain amounts of pain and risks of injuries as a part of their sport. However, it can be dangerous when those in charge of the programs are placing more emphasis on the outcome of the competition than on the health and well-being of the athletes. Nixon (1994) reported that over half of the coaches surveyed indicated an expectation for athletes to push themselves to their physical limits. A majority of these coaches also reported that they felt their athletes could rely on coaches, officials, and sports medicine personnel to protect and care for them. However, this research addressing what coaches report their behaviors to be and their actual behaviors on the sideline or on the bench do not always match. Although coaches often care about their athletes’ health and well-being off the court, they often express their expectation and likely even encourage their athletes to take physical risks.

When athletes are ridiculed or made fun of for not being willing to play with an injury, this negative feedback is likely to leave the athlete feeling poorly about

himself/herself, and feel pressured to play with the pain, or to leave the setting completely by quitting the sport. Athletes commonly get the messages that they should play as long as they can with pain or injury, and when they succumb to the injury, they may be pressured to return as soon as possible (Nixon, 1993).

Summary

Athletes are taught at a very early age that being able to tolerate pain and play with injury is a rewarded behavior, and represents a glorification of "the character of athletes who endure with a high pain threshold, sacrifice for the team, and ignore the personal consequences" (Nixon, 1993, p.188). Meanwhile, athletes who choose to openly talk about their pain and injury may be viewed negatively as "weak" or as "damaged goods". Athletes are pressured by teammates, coaches, and even sports medicine personnel to play as long as possible with pain and injury. And, when the pain finally becomes too much, the emphasis or pressure often changes to getting the athlete back to participation as soon as possible.

Many athletes are willing to pay the physical price in order to be considered an athlete and be a member of the athlete "club". As a result of this loyalty, athletes often live up to the rule of the sport ethic – willing to pay the price, accept risks, and exceed limits - no questions asked. Injury is not only accepted within sport, but those who experience significant pains and injuries and who are willing to play through those pains and injuries often receive the accolades of others. Athletes who are willing to play injured or who are willing to put their personal health on the line for the team are glorified. Oftentimes, athletes are willing to make these sacrifices even if their future health is placed into question. Whether it is having repeated surgeries to fix the damage or using

medications to dull the pain enough to be able to play, athletes are willing to do almost anything to continue playing in their beloved sport. The power of the athlete identity can be very significant, as is the motivation to remain within the “athlete” fraternity.

“Since the culture of risk is part of what identifies them as members of an athletic subculture, (athletes) are unlikely even to consider challenges” to the system (Nixon, 1992, p. 130). It is clear that the acceptance of the culture of risk in sport places athletes at risk when they choose to ignore pain and injury and they risk more significant injury by choosing to play with pain and injury. Athletes are being sent a variety of messages regarding what is expected of them in regards to their willingness to endure physical pain and injury in the name of their sport and athletes often choose to live up to the sport ethic, regardless of the long-term health consequences. Hughes and Coakley (1991) concluded that “as long as athletes are committed to the sport ethic without qualification; they will think it is honorable to try anything to stay involved in sport” (p. 321). Gaining a better understanding and appreciation of the social forces at play when athletes experience pain and injury in sport may assist sports medicine personnel countering the powerful sport ethic. This understanding and appreciation will allow sports medicine personnel to provide athletes with a safe and supportive environment in which to seek assistance for their pain and injuries, which in turn will encourage athletes to seek help and minimize risk of permanent injury or disability.

The long-term goal for this line of research is to identify personal and situational factors that may influence athletes’ immediate responses to pains and injuries and their willingness to seek assistance for the pains and injuries experienced during participation in sport. More specifically, this investigation examined the influences of the sport ethic, in particular the expectation of toughness component, athletic identity and attitude toward

pain and injury on overall help-seeking tendencies. It is believed that by increasing the understanding of how the social-situational factors impact athletes' responses to pain and injury and willingness to seek help, it may be possible for coaches and sports medicine personnel, those who are responsible for the health and well-being of athletes, to develop and implement strategies to promote a supportive environment for athletes to seek assistance for pain and injury. This supportive environment may counter potentially negative forces that may encourage athletes to play through pain or injury resulting in increased risk of permanent disability. Today's athletes often receive mixed messages regarding what is expected of them in regards to physical pain and injury in sport. Gaining a better understanding and appreciation of the social forces at play when athletes experience pain and injury in sport may assist sports medicine personnel to develop a supportive and health-promoting environment to work against the powerful culture of risk associated with sport. The safe and supportive environment will in turn encourage athletes to seek help for pain and injuries and minimize risk of permanent injury or disability.

CHAPTER III

METHODS

Overview

The purpose of this investigation was to examine the influence of athletic identity, expectation of toughness, and attitude toward pain and injury on instrumental and emotional social support help-seeking tendencies for the pains and injuries athletes experience during their participation in sports. A self-report survey design was used with a convenience sample of 222 collegiate athletes representing 12 athletic teams at two Midwestern NCAA Division III institutions. Roster members of selected teams were asked to complete a survey measurement tool designed to assess a) their degree of identification as an athlete, b) their expectation of toughness associated with sport participation, c) their reported attitude toward pain and injury within the context of sport participation, and d) their instrumental and emotional social support help-seeking tendencies for pains and injuries experienced during sport. Demographic information was also collected to aid in gaining insight into the role of the athletic identity, expectation of toughness, reported attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on gender and sport of participants. In addition to gender and sport, other information was collected for use in further analyses, including age, race/ethnicity, current year of athletic eligibility, and current playing status. Questions addressing participants' previous participation in co-ed sport, injury history severity, whether participants had missed at least one month due to

injury, and whether participants had ever experienced pain or injury during participation in sport for which they did not immediately seek assistance were also included within the participant information form.

Pilot Investigation

A pilot investigation examining the validity of the measurement tools addressing athletic identity, expectation of toughness, reported attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies was performed during Spring 2006. A self-report survey was administered to a convenience sample of 103 undergraduate students. Participation was voluntary and all participants were asked to complete the questionnaire designed to assess their degree of athletic identification, expectation of toughness, reported attitude toward pain and injury within the context of sport and exercise, and instrumental and emotional social support help-seeking tendencies following athletic injury through their responses to Likert-type response statements.

Sample Description and Selection

Participants included 103 college students (35 males, 68 females) enrolled in physical activity classes or current roster members of a university sanctioned athletic team. Thirty-one participants identified themselves as currently participating in organized sport. Although the remaining participants in the sample did not identify themselves as currently participating in organized sport, 74 participants (69.9%) reported previous participation in organized sport, thus indicating involvement in the culture of sport at some point in their lives. Participants' ages ranged from 18 to 50 years of age with a mean age of 21.2 (SD = 4.65). Although participants under age 18 were to be excluded

from this investigation due to issues with obtaining informed consent, all participants in this investigation identified themselves as 18 years or greater of age. Participants were recruited from activity classes and athletic teams due to the physically active lifestyle of the sample, their risks of experiencing physical pains and injuries related to physical activity, and the likelihood of their current and/or previous participation in organized sport.

Measurement Instruments

A survey measurement tool was administered to all participants after written informed consent was obtained. The measurement tool for this study contained the following five components:

1. The first component included demographic information, consisting of gender of the participant, current sport, current sport participation status, race/ethnicity, age, and brief injury/pain history.
2. The second component of the measurement tool was the Athletic Identity Measurement Scale (AIMS) developed by Brewer et al. (1993). Athletic identity has been defined as "the degree to which an individual identifies with the athlete role" (Brewer et al., 1993, p. 237). The AIMS consists of 10 statements to which the participants respond based on their agreement or disagreement with each statement. Data reduction for the AIMS involved summation of scores on the ten items and the reporting of a single AIMS score represents the degree to which they identify themselves as athletes. A coefficient alpha of .93 was found for the 10-item measure with the 103 participants of the pilot investigation, consistent with previous reliability statistics for the measure (Brewer et al., 1993).

3. The Risk, Pain, and Injury Items (RPII) questionnaire comprised the third component of the measurement tool. The RPII questionnaire was developed by Nixon (1994) and was previously used to determine the extent to which coaches and athletes subscribe to the beliefs of the sport ethic, or culture of risk associated with sport participation (Nixon, 1994; 1996). The questionnaire was developed based on previous research by Nixon (1993) who identified content items (messages) in popular media related to athletic socialization and rationalization as it relates to risk of pain and injury from sport participation through qualitative inquiry. The RPII questionnaire was developed with three subscales, including Tough, Pressed, and Rational Choice. The Tough subscale exhibited a coefficient alpha of .79 and was reported by Nixon (1996b) to address athletes' "expectation of toughness regarding risk, pain, and injury in sport" (p. 36). The five-item Rational Choice subscale addressed athletes' premeditated willingness to accept the risks of sport, while the three-item Pressed subscale was defined by the notion of pressure by coaches (and fans) to play hurt (Nixon, 1996b). The Rational Choice subscale and Pressed subscale exhibited low reliability (.35 and .53, respectively) with pilot testing, and thus were not used in the current study. The current investigation focuses on the expectation of toughness aspect of the sport ethic and the Tough subscale for further analysis and comparison. The 11 items of the Tough subscale were summed to represent participants' expectation of toughness related to the pain and injuries experienced in sport. Again, due to the low reliability of the Rational Choice and Pressed subscales and focus of this investigation on the toughness aspect of the sport ethic, only the Tough subscale was used in this investigation.

4. The Sports Inventory for Pain (SIP) was the fourth component and involved questions related to athletes' attitudes toward pain and injury while participating in sport, as well as strategies for coping with pain and injury (Meyers, Bourgeois, Stewart, & LeUnes, 1992). Five subscales were identified in the SIP including Direct Coping (SIP COP), Cognitive (SIP COG), Catastrophic (SIP CAT), Avoidance (SIP AV), and Bodily Awareness (SIP BA).The *Direct Coping* subscale addresses how much attention athletes provide pain, discomfort, and injury during competition, with items such as "when hurt, I tell myself I can't let the pain stand in the way of what I want to do". High scorers in direct coping tend to ignore pain and in general 'tough it out' (Meyers et al., 1992). The Direct Coping subscale exhibited the greatest reliability during the pilot investigation with a coefficient alpha of .88. The *Cognitive subscale* exhibited the next highest reliability with a coefficient alpha of .74. The Cognitive subscale signifies the use of mental strategies in attempting to deal with pain, including "when in pain, I replay in my mind pleasant performances from my past." High scorers on the Cognitive subscale reflect the use of a number of mental skills to maintain a focus on the given task, thereby minimizing the effect of pain on completion of the task (Meyers et al., 1992). The *Catastrophizing subscale* emphasizes the tendencies for athletes to dwell on the pain and essentially 'give up', for instance, "When in pain, I worry all the time about whether it will end". Low scores on Catastrophizing indicate athletes' abilities to minimize catastrophic thinking and maintain an optimistic frame of mind (Meyers et al., 1992). Independently, the Catastrophizing subscale exhibited a reliability coefficient of .41. The fourth subscale included in the SIP was the *Avoidance subscale,* which assesses the use of avoidant strategies to deal with pain, for example "when in pain, I have to be careful not to

make it worse". High scorers in Avoidance are believed to be less competitive when injured (Meyers et al., 1992). The *Body Awareness Subscale* addresses hyposensitivity and hypersensitivity to pain, with items including "I seldom notice minor injuries". Psychometric analyses on the Avoidance and Body Awareness subscales revealed low reliability for both of the subscales (coefficient alpha = .32 and .44, respectively).

A Total Coping Response (SIP TCR) score using the three SIP subscales was calculated by subtracting the Catastrophizing subscale from the sum of the Coping and Cognitive subscales. Coefficient alpha for reliability for the overall composite score (SIP TCR) was found to be .86 for the 17 items during pilot testing. Although the SIP has not been shown to be a good predictor of behavior when pain has been introduced (Bartholomew, Brewer, Van Raalte, Linder, & Cornelius, 1998), the SIP is the only existing measure of the athlete's self-reported tendencies for responding to pain and injury, a central issue addressed in this research. The demonstrated reliability and construct validity of the overall composite score representing the SIP TCR support its use in this investigation.

5. The COPE Inventory was the final component of this measurement tool. The COPE Inventory was developed to assess a broad range of coping responses and involved a number of associative and disassociative responses to stressors (Carver et al., 1989). COPE is a measure of tendencies of dealing with general stress, however, the instructions of the measure were further specified to ask participants to focus on athletic injury as their stressor. Fifteen scales were identified in the COPE and two of the scales were focused on for this investigation. The intent of this investigation was to address help-seeking tendencies for pain and injuries that commonly occur during

participation in sport and other physical activities. Therefore, only the Instrumental Social Support (COPE ISS) and Emotional Social Support (COPE ESS) scale were used for further analyses. Each scale of the full COPE involves four items. In the pilot investigation, a coefficient alpha of .82 was found for the COPE ISS scale, and a coefficient alpha of .88 was found for the COPE ESS scale.

Pilot Results

To compare male and female responses on the measures, as well as compare current sport participation status (dichotomous response indicating whether the participants were currently participating in organized sport), a two-way (2x2; gender by sport participation status) analysis of variance was performed for each measure. Regarding athletic identification as measured by the AIMS, significant mean differences were noted based on gender ($F= 14.05$, $p<.001$, ES=.12) and sport participation status ($F= 37.99$, $p<.001$, ES=.28), but not for the interaction of gender and current sport participation status ($F=.24$, $p=.63$). In general, males reported greater identification as athletes (mean=38.33, SD=6.84) than females (mean=25.88, SD=7.28), and those participants who identified themselves as currently participating in sport also reported greater identification as athletes (mean=40.04, SD=6.17) than participants not currently participating in sport (mean=25.95, SD=6.92). For the 11-items representing the Tough subscale of the RPII, significant mean differences were found based on gender ($F= 14.79$, $p<.001$, ES=.01) and the interaction of gender and current sport participation status ($F= 4.10$, $p=.046$, ES=.04), but not for current sport participation status alone ($F=1.26$, $p=.26$). Overall, the findings suggested that male participants reported greater levels of expectation of toughness (mean=29.93, SD=4.58) than female participants (mean=25.91, SD=3.82). Male participants who identified themselves as currently

participating in organized sport reported greater levels of expectation of toughness (mean=31.21, SD=4.26) than males not currently participating in organized sport (mean=27.73, SD=4.43). Yet, female participants who identified themselves as not currently participating in organized sport reported greater levels of expectation of toughness (mean=26.05, SD=3.80) than females identified as currently participating in organized sport (mean=24.71, SD=4.07).

A significant mean difference was found based on gender for attitude toward pain and injury (SIP TCR) ($F=12.31$, $p<.001$, ES=.11), but not based on current sport participation status ($F=3.70$, $p=.06$) or based on the interaction of sex and current sport participation status ($F=1.92$, $p=.17$). Male participants reported greater attitudes of seeing pain and injury as a challenge to be overcome or as something to be ignored (mean=32.47, SD=8.34) than female participants (mean=24.51, SD=6.58), and participants identifying themselves as currently participating in sport also reported greater attitude of seeing pain and injury as a challenge to be overcome or ignored (mean=32.27, SD=6.57) than participants not currently participating in sport (mean=25.03, SD=7.67).

Significant group differences were also noted on social support help-seeking tendencies as indicated by scores on the COPE-Instrumental Social Support (ISS) and Emotional Social Support (ESS) scales. Significant mean differences were found for ISS based only on gender ($F=11.92$, $p=.001$, ES=.11). Male participants reported significantly less instrumental social support help-seeking tendencies (mean=10.40, SD=1.89) than female participants (mean=12.50, SD=2.72). No significant mean differences were found in instrumental social support help-seeking tendencies based on current sport participation status ($F=0.12$, $p=.73$) or the interaction of gender and current

sport participation status (F=3.86, p=.05). Significant mean differences were found for emotional social support help-seeking tendencies based on gender (F=15.47, p<.001, ES=.14) and the interaction of gender and current sport participation status (F=5.59, p=.02, ES=.05), but not for current sport participation status alone (F=1.73, p=.19). Male participants reported less emotional social support help-seeking tendencies (mean=8.67, SD=2.52) than female participants (mean=11.71, SD=2.80). Male participants who identified themselves as currently participating in organized sport reported less emotional social support help-seeking tendencies (mean=7.90, SD=2.38) than males not currently participating in organized sport (mean=10.00, SD=2.28). Female participants who reported currently participating in organized sport reported greater emotional social support help-seeking tendencies (mean=12.43, SD=2.82) than females not currently participating in organized sport (mean=11.62, SD=2.81).

Results of regression analysis demonstrated significant predictive relationships. (See Table 1 for regression statistic values.) Using stepwise regression, attitude toward pain and injury, as measured by SIP Total Coping Response, was found to be a significant predictor of both instrumental social support help-seeking tendencies, (t=-2.84, p=.006, Adjusted R^2=.16) and emotional social support help-seeking tendencies (t=-3.71, p<.001, Adjusted R^2=.24). In addition, both athletic identification (t=5.41, p<.001) and expectation of toughness (t=4.62, p<.001) were found to be significant predictors of participants' attitude toward pain and injury explaining 46.4% of the variance.

Data reduction analyses were performed by analyzing the correlation matrix for the five scales and through factor analysis with Varimax rotation. These analyses were performed to examine whether the five scales included in this investigation were

representing one general construct or whether the presence of correlated factors was evident. Analysis of the correlation matrix indicated the possible presence of two factors within the five scales. The AIMS, RPII Tough, and SIP TCR scales seemed to hang together, while the COPE ESS and COPE ISS showed a negative relationship with the other three scales and a strong positive relationship with each other. (See Table 2.)

Table 1. Pilot Regression Statistics (* indicates significance at p<.05)

Dependent Variable	Predictor	F	Standard. Beta	t
COPE ISS		16.86*		
	AIMS		-0.16	-1.36
	RPII Tough		0.11	0.97
	SIP TCR		-0.37	-2.84*
COPE ESS		11.35*		
	AIMS		10.14	-1.27
	RPII Tough		0.06	0.52
	SIP TCR		-0.45	-3.71*
SIP TCR		42.97*		
	AIMS		0.44	5.41*
	RPII Tough		0.38	4.62*

Table 2. Correlation Matrix for Pilot Measures. (Reliability coefficients in diagonal.)

Measure	AIMS	RPII Tough	SIP TCR	COPE ISS	COPE ESS
AIMS *10 items*	*.93*				
RPII Tough *11 items*	.40	*.79*			
SIP TCR *17 items*	.61	.56	*.86*		
COPE ISS *4 items*	-.34	-.16	-.39	*.88*	
COPE ESS *4 items*	-.41	-.23	-.51	.79	*.89*

The results of the factor analysis indicated a two-factor model with an eigenvalue of 1.13 and 78.26% of the variance explained. With Varimax rotation, one component included the AIMS, RPII-Tough, and SIP TCR scales with factor loadings of .74, .85, and .80, respectively. COPE ISS and COPE ESS scales loaded on the second component with factor loadings of .94 and .91, respectively. This analysis and the results indicating the presence of two factors among the measures supports the proposed model of Research Question 1b.

Table 3. Pilot Factor Analysis Results: Eigenvalues and Percent Explained Variance

Component	Eigenvalue	Cumulative % Variance
1	2.79	55.75
2	1.13	78.26
3	0.56	89.51
4	0.34	96.40
5	0.18	100.00

Table 4. Pilot Factor Analysis Results: Factor Loadings on Two-Factor Model

	PCA		Varimax Rotation	
Scale	**1**	**2**	**1**	**2**
AIMS	.73	.31	.74	-.28
RPII Tough	.61	.60	.85	.01
SIP TCR	.83	.30	.80	-.35
COPE ISS	-.74	.60	-.13	.94
COPE ESS	-.81	.48	-.26	.91

Overall, the results of this pilot investigation supported the use of the measures in investigations addressing the roles of athletic identity, belief in the sport ethic, and attitude toward pain and injury on instrumental and emotional social support help-seeking tendencies following injury. Reliability coefficients for the five scales ranged from .79 to .93, which are within acceptable limits. Although research is in its early stage in addressing the role of the sport ethic in athletes' responses to pain and injury, results of the pilot investigation indicate further research in the area is warranted. Significant mean differences were noted based on gender for all measures, and differences were also noted on athletic identity and attitude toward pain and injury based on current sport participation status.

Participants

The current investigation involved 222 participants representing 12 athletic teams from two Midwestern NCAA Division III institutions. All participants were current members of the six identified athletic teams at each institution as indicated by their presence on the team roster. The institutions were selected partly because they included the sports of men's and women's ice hockey, men's and women's basketball, and men's and women's swimming. Participants were between 18 and 26 years of age with an average age of 20.1 (SD=1.51). In preparation for this investigation, it was determined that participants under age 18 would be excluded due to issues with obtaining informed consent. However, this was not an issue as all 222 participants indicated they were 18 years and older in age.

As indicated, this investigation included athletes representing increased risk, moderate risk, and lower risk sport from the sport teams of men's and women's ice

hockey (increased risk), men's and women's basketball (increased risk and moderate risk, respectively), and men's and women's swimming (lower risk). An equal number of male and female teams were recruited from companion sports (ice hockey, basketball, and swimming) to allow for comparisons across gender and sport. All of these sports are considered winter season sports and were midway through their seasons at the time of participant recruitment.

Instruments of Measurement

This investigation was conducted employing self-report survey methodology to collect the data. The measures used in this investigation were previously used and tested in a pilot study performed during Spring 2006. The measurement tool used for this investigation contained five components. (See Appendix A.)

1. The first component included demographic information for the participants. The demographic information obtained included age, gender, race/ethnicity, institution, sport, previous participation in co-ed sport, current playing status, brief injury history, whether participants had experienced pain or injury during participation in sport for which they did not immediately seek assistance, how bad the pain has to get before seeking help, and how likely participants were to play through pain and injury in sport. Gender and sport group were the focus for comparison of the measures.
2. The second component of the survey was the Athletic Identity Measurement Scale (AIMS) developed by Brewer et al. (1993). The AIMS consists of 10 statements to which the participants respond based on their agreement or disagreement with each statement. Summation of scores on the ten items yields a single AIMS score that represents the degree to which the individual identifies as an athlete. A coefficient

alpha of .81 was found for the 10-item measure with the 222 participants of this investigation, which is below the previous .93 reliability statistic for the measure found in pilot work and reported by its developer, Brewer et al. (1993). Although the reliability coefficient decreased from previous investigations, it remained within acceptable limits for use in the investigation. In addition to reliability testing, factor analysis for the 10 items using principal components analysis revealed one factor (eigenvalue = 3.87) accounting for 37.44% of the variance and with factor loadings on the 10-items ranging from 0.39 to 0.76. (See Tables 5-6.)

Table 5. AIMS Principal Components Analysis

	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	3.77	37.74	37.74
2	1.46	14.56	52.30
3	1.09	10.91	63.21
4	0.74	7.39	70.60
5	0.69	6.85	77.45

Table 6. AIMS Items Factor Loadings for 1 Factor

	Component 1
AIMS 1	.56
AIMS 2	.60
AIMS 3	.53
AIMS 4	.74
AIMS 5	.76
AIMS 6	.51
AIMS 7	.66
AIMS 8	.39
AIMS 9	.65
AIMS 10	.65

3. The Risk, Pain, and Injury Items questionnaire was the third component of the measurement tool. The Risk, Pain, and Injury Items (RPII) questionnaire was developed by Nixon (1994a, 1996b) and was previously used to determine the extent to which coaches and athletes subscribe to the beliefs of the sport ethic, or culture of risk associated with sport participation. The questionnaire was developed from previous research by Nixon (1993) after identifying content items (messages) in popular media related to athletic socialization and rationalization as it relates to risk of pain and injury from sport participation. Nixon presented three subscales addressing Tough, Rational Choice, and Pressed (1996b). The Tough subscale addressed athletes' "expectation of toughness regarding risk, pain, and injury in sport" (Nixon, 1996b, p. 36) with reported factor analysis loadings greater than 0.46 for all items. The Rational Choice subscale addressed the athletes' premeditated willingness to accept the risks of sport, but contained only five items. The Pressed subscale is defined by the notion of pressure by coaches (and fans) to play hurt, with only three items comprising the subscale.

   Reliability coefficients for the three subscales based on the data in this investigation were found to be .80 for the Tough subscale, .58 for the Pressed subscale, and .31 for the Rational Choice subscale. These findings were consistent with the pilot testing reliabilities found for the subscales (.79, .53, .35, respectively). The focus of this investigation remains on the toughness aspect of the sport ethic and its relationship to help-seeking behaviors. Although the Pressed and Rational Choice subscales may also provide insight into components of the sport ethic, they did not exhibit sufficient psychometric properties to be included in this investigation.

Therefore, the 11 items of the Tough subscale were summed to represent participants' expectations of toughness related to the pain and injuries experienced in sport. Factor analysis of the Tough subscale using principal components analysis revealed the presence of one factor (eigenvalue = 3.87), which explained 35.22% of the variance. Factor loadings ranged from .25 to .73 for the 11 items of the Tough subscale. (See Tables 7-8.) Item 11 of the questionnaire had the lowest loading (.25), while the next lowest loading was .44 (Item 16). Despite the low factor loading on Item 11, the item has relevance within this investigation and was not considered problematic; therefore, the full 11-item Tough subscale developed by Nixon (1994) was used in this investigation, which exhibited adequate psychometric properties.

Table 7. RPII Tough Subscale Principal Components Analysis

	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	3.87	35.22	37.74
2	1.32	11.98	52.30
3	1.08	9.82	63.21
4	0.82	7.43	70.60
5	0.79	7.17	77.45

Table 8. RPII Tough Subscale Items Factor Loadings with Varimax Rotation

	Component 1	Component 2
RPII 2	.56	-.25
RPII 3	.69	-.34
RPII 7	.73	-.06
RPII 9	.68	-.02
RPII 10	.62	.27
RPII 11	.25	.72
RPII 12	.64	-.31
RPII 14	.59	.45
RPII 16	.44	.09
RPII 25	.65	-.32
RPII 28	.50	.38

4. The Sports Inventory for Pain (SIP) made up the fourth component of this investigation and involved questions related to the athlete's attitude toward pain and injury while participating in sport, as well as strategies for coping with pain and injury (Meyers et al., 1992). The SIP is a copyrighted measure, and permission was obtained from primary author for use in this research investigation via electronic mail communication. Five subscales were identified in the SIP including Direct Coping (SIP COP), Cognitive (SIP COG), Catastrophic (SIP CAT), Avoidance (SIP AV), and Bodily Awareness (SIP BA). The *Direct Coping* subscale addresses how much attention athletes provide pain, discomfort, and injury during competition, with items such as "when hurt, I tell myself I can't let the pain stand in the way of what I want to do". High scorers in direct coping tend to ignore pain and in general 'tough it out' (Meyers et al., 1992). The *Cognitive subscale* signifies the use of mental strategies in attempting to deal with pain, including "when in pain, I replay in my mind pleasant performances from my past." High scorers on the cognitive subscale reflect the use

of a number of mental skills to maintain a focus on the given task, thereby minimizing the effect of pain on completion of the task (Meyers et al., 1992). The *Catastrophizing subscale* emphasizes the tendencies for athletes to dwell on the pain and essentially 'give up'; for instance, "When in pain, I worry all the time about whether it will end". Low scores on Catastrophizing indicate athletes' abilities to minimize catastrophic thinking and maintain an optimistic frame of mind (Meyers et al., 1992). The *Avoidance subscale* assesses the use of avoidant strategies to deal with pain, for example, "when in pain, I have to be careful not to make it worse". High scorers in Avoidance are believed to be less competitive when injured (Meyers et al., 1992). The *Body Awareness Subscale* addresses hyposensitivity and hypersensitivity to pain, with items including "I seldom notice minor injuries". A Total Coping Response (SIP TCR) is calculated by subtracting the Catastrophizing subscale from the sum of the Coping and Cognitive subscales.

Initial testing of the SIP by Meyers et al. (1992) confirmed internal consistency with Cronbach's coefficient alpha levels between .61 and .88. Test-retest reliability of coefficients ranged from .69 to .88. Overall composite scores (SIP TCR) were calculated for all participants. Although the SIP has not been shown to be a good predictor of behavior when pain has been introduced (Bartholomew et al., 1998), the SIP does address athlete's self-reported tendencies for responding to pain and injury, a central issue addressed in this research.

Psychometric testing of the SIP for the data in this investigation found reliability coefficients for the five subscales to be: Coping subscale=.85, Cognitive subscale=.69, Catastrophic subscale=.64, Avoidance subscale=.35, and Body Awareness subscale= 38. Reliability for the overall composite score (SIP TCR) was

found to be .82 for the 17 items used in this investigation, which includes the items of the Direct Coping, Cognitive, and Catastrophic subscales.

Principal components factor analysis for the items included in the SIP TCR yielded two factors explaining 45.28% of the variance. (See Results in Tables 9-10.) The first factor included the items of the Direct Coping and Cognitive subscales, while the second factor included the items of the Catastrophic subscale. Factor loadings for the Direct Coping and Cognitive subscales represented in the first factor ranged between .29 and .73. Items representing the Catastrophic subscale and representing the second factor presented factor loadings ranging from .56 to .71. These results supported the use of the SIP TCR composite score in further analyses.

Table 9. SIP TCR Composite Score Principal Components Analysis

	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	5.05	29.68	29.68
2	2.65	15.60	45.28
3	1.23	7.22	52.50
4	0.95	5.59	58.09
5	0.87	5.10	63.19

Table 10. SIP TCR Items Factor Loadings with Varimax Rotation

	Component 1	Component 2
SIP 1	.64	-.23
SIP 2	.72	-.24
SIP 3	.73	-.03
SIP 7	.63	-.04
SIP 8	.48	.43
SIP 12	.54	-.37
SIP 13	.61	.36
SIP 17	.67	-.14
SIP 18	.29	.42
SIP 22	.65	-.25
SIP 23	.40	.47
SIP 24	.72	-.13
SIP 25	.73	-.14
SIP 04	.20	.58
SIP 09	.05	.56
SIP 14	-.05	.71
SIP 19	.26	.64

5. The COPE Inventory (Carver et al., 1989) was the final component of this investigation. The COPE Inventory was developed to assess a broad range of coping responses and includes associative and disassociative responses. Fifteen scales constitute the COPE including positive reinterpretation and growth, mental disengagement, focus on and venting of emotions, use of instrumental social support, active coping, denial, religious coping, humor, behavioral disengagement, restraint, use of emotional social support, substance use, acceptance, suppression of competing activities, and planning. Because COPE is a measure of tendencies of dealing with general stress, instructions for this investigation asked participants to focus on athletic injury as their stressor.

The COPE Instrumental Social Support (COPE ISS) and COPE Emotional Social Support (COPE ESS) scales were used for analysis and comparison within this investigation. Although a number of additional coping strategies could be addressed in relation to coping with pain and injuries, the intent of this investigation was to focus on athletes' help-seeking tendencies for pains and injuries experienced in sport in the form of instrumental and emotional social support help-seeking. This investigation has been the first known work in the area addressing how the components of the sport ethic may influence ways athletes cope with pains and injuries experienced in sport. Further research should be explored to examine additional coping strategies used by athletes in dealing with pains and injuries experienced in sport, however, addressing the plethora of possible coping strategies was not the intent of this investigation.

Psychometric testing of the COPE was performed by its developers including confirmatory factor analysis and reliability. Factor loading ranges for the COPE ISS scale ranged between .55 and .66 with a scale reliability of .75. The COPE ESS scale exhibited factor loadings ranging between .58 and .71 with a reported scale reliability of .85 (Carver et al., 1989). In this investigation, a coefficient alpha of .86 was found for the COPE ISS scale, and a coefficient alpha of .79 was found for the COPE ESS scale. One factor was found to include the items of the COPE ISS scale (eigenvalue = 2.44), explaining 60.97% of the variance and with factor loadings ranging from .73 to .83. (See Tables 11-14 for results.) The items of the COPE ESS scale were also found to represent one factor (eigenvalue = 2.80) with factor loadings ranging from .76 to .87 and explaining 70.08% of the variance. These results supported the use of the scales in this investigation.

Table 11. COPE ISS Principal Components Analysis

	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	2.44	60.97	60.97
2	0.62	15.52	76.48
3	0.53	13.23	89.72
4	0.41	10.28	100.00

Table 12. COPE ISS Items Factor Loadings for 1 Factor

	Component 1
COPE04	.74
COPE14	.83
COPE30	.82
COPE45	.73

Table 13. COPE ESS Principal Components Analysis

	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	2.80	70.08	70.08
2	0.54	13.60	83.68
3	0.35	8.68	92.36
4	0.31	7.64	100.00

Table 14. COPE ESS Items Factor Loadings for 1 Factor

	Component 1
COPE 4	.84
COPE 14	.87
COPE 30	.76
COPE 45	.87

Procedures

Participant Recruitment

Following the notification of IRB approval, contact was made with the head coaches and/or athletic training personnel of the selected teams to arrange times to administer the measurement tool. Permission to recruit participants was obtained from the head coach and/or athletic training personnel for each athletic team prior to the recruitment of participants for this study. Times were arranged with each coach/athletic trainer to allow for the administration of the tool by the principal investigator or other designated person during December 2006 and January 2007. All sports are considered winter season sports and were one-third to one-half way through their competitive season at the time of administration.

Survey Administration Procedures

Participation in this investigation was strictly voluntary and confidentiality of responses was maintained. There were no physical risks and only minimal psychological risks to the participants who chose to participate in this investigation. Minimal psychological risk may result from the participants' recollections of their attitudes and responses to physical pains and injuries. After a brief explanation of the intent of the investigation, written consent was obtained from each participant and the participants were asked to complete the measurement instruments. Data collection involved a one-time administration of the battery of measurement tools and took participants between 20 and 30 minutes to complete. After obtaining written consent, all participants completed demographic information. The presentation of the remaining surveys within the packet [i.e., AIMS (A), RPII (B), SIP (C), and COPE (D)] was counterbalanced as follows:

Packet 1.	A	B	C	D
Packet 2.	B	A	D	C
Packet 3.	C	D	A	B
Packet 4.	D	C	B	A

The principal investigator administered the measurement instrument to 10 of the 12 participating teams. Due to scheduling conflicts, the head athletic trainer for the institution arranged for the administration of the survey to the remaining two teams. All survey materials were placed in individual envelopes that were able to be sealed by participants following the completion of the measures to assure confidentiality. The sealed envelopes were then returned to the principal investigator by the head athletic trainer.

Data Analysis

Preliminary statistical analyses were performed on the measurement scales to provide descriptive statistics. The proposed structural path analysis model (see Figure 8) and structural regression model (see Figure 9) were tested using regression analyses and through structural equation modeling. Fit indices described by Hu and Bentler (1999) and Browne and Cudeck (1993) were used to determine model fit. Multivariate analysis of variance was performed to identify differences based on gender and sport on the five measures. Lastly, statistical analysis was performed on the items included in the RPII Tough subscale and SIP TCR composite score to identify whether the items exhibited differential item functioning based on group (gender and sport).

Specifically, the research questions in this study were tested by using the following statistical analyses:

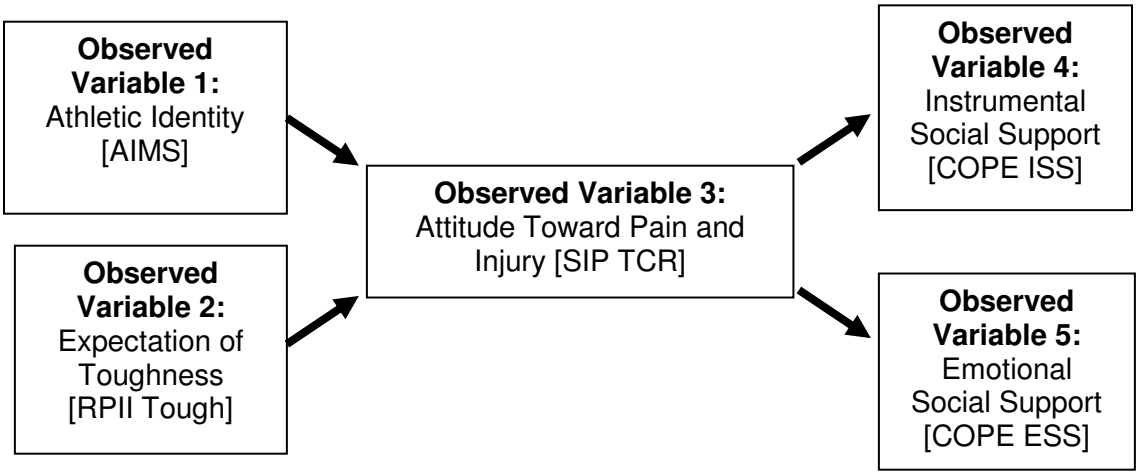
Research Question 1. Are athletic identity, expectation of toughness, and reported attitude toward pain and injury related to athletes' instrumental and emotional social

support help-seeking tendencies for pains and injuries experienced during sport participation?

Research Question 1a. Are athletic identity and expectation of toughness predictors of reported attitude toward pain and injury and is attitude toward pain and injury a predictor of athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries? (See Figure 8.)

Statistical Analysis: Structural equation modeling was used to test the following path analysis model.

Figure 8: Primary Structural Path Analysis Model Statistical Analysis

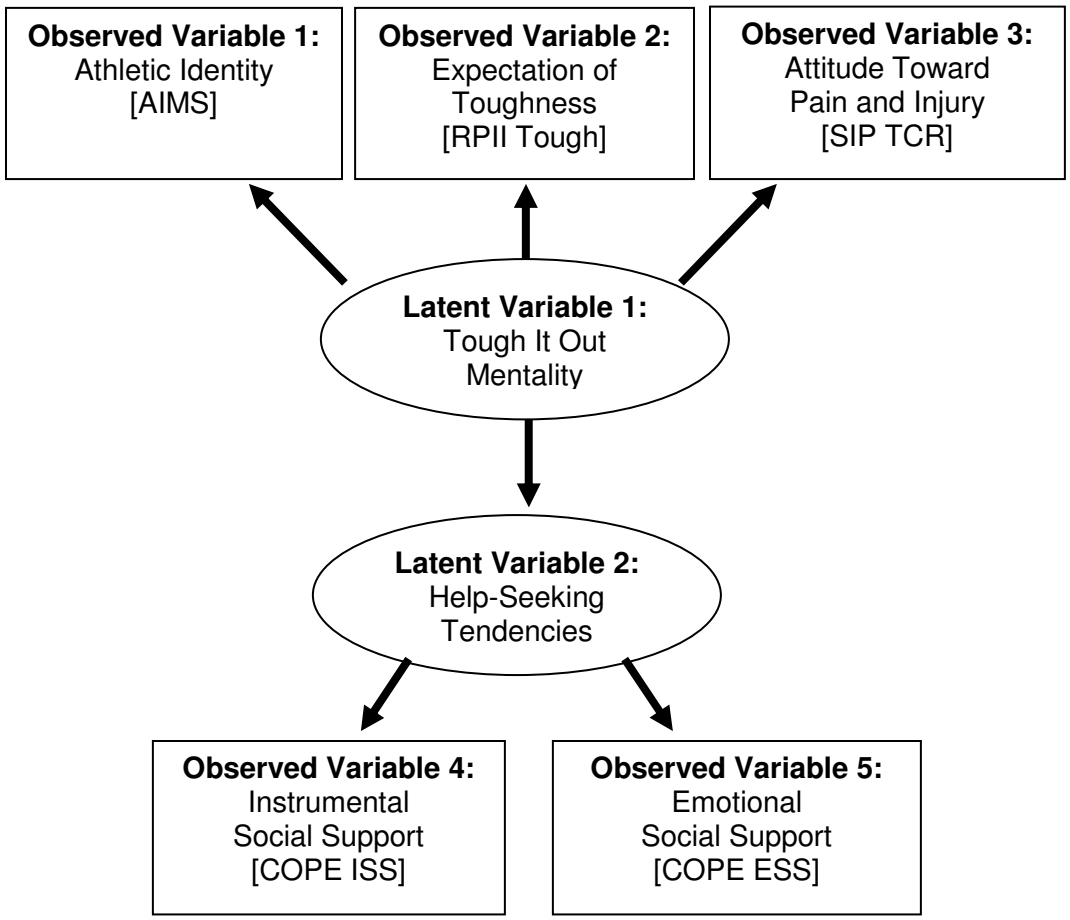


Research Question 1b. Are athletic identity, expectation of toughness, and attitude toward pain and injury predictors of athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries? (See Figure 9.)

Statistical Analysis: Structural equation modeling was used to test the following structural regression model. Athletic identity (AIMS), expectation of toughness

(RPII Tough), and attitude toward pain and injury (SIP TCR) made up the latent variable *Tough It Out Mentality*, while the *Help-Seeking Tendencies* latent variable included the instrumental social support (COPE ISS) and emotional social support (COPE ESS) observed variables. A comparison of fit indices for the two proposed models was performed to identify the model of best fit.

Figure 9: Alternate Structural Regression Model Statistical Analysis



Research Question 2. Are there differences for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies and on item response for the RPII Tough subscale and SIP TCR scale based on gender (i.e., male and female) and sport (i.e., ice hockey, basketball, and swimming)?

Research Question 2a. Are there significant mean differences for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on gender (i.e., male participants and female participants), sport (ice hockey, basketball, and swimming), and the interaction of gender and sport?

Statistical Analysis. A two-way (2x3; gender x sport) multivariate analysis of variance (MANOVA) was performed to identify significant mean differences in athletic identity, expectation of toughness, reported attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies for pains and injuries based on gender (i.e., male athletes and female athletes), sport (i.e., ice hockey, basketball, swimming), and the interaction of gender and sport?

Research Question 2b. Do the items of the RPII Tough and SIP TCR scales exhibit differential item functioning when the reference and focal groups are males versus female or when the reference and focal groups are type of sport (e.g., ice hockey versus basketball)?

Statistical Analysis. Conditional analyses were conducted using SIBTEST to examine the degree of differential item functioning (DIF) of the items on the RPII Tough and SIP Total Coping Response scales. Analyses to identify DIF have

been primarily used to identify differential performance within cognitive standardized testing situations. In those cases, DIF is said to occur when “test takers of equal proficiency on the construct intended to be measured by a test, but from separate subgroups of the population, differ in their expected score on the item" (Roussos & Stout, 2004, p. 107). In other words, the analysis identifies participants who have the same overall score on the test, and then examines whether participants from the different subgroups exhibit differences in their responses to each particular item of the test. Common subgroups examined with DIF analyses within standardized testing tend to be readily identifiable subgroups, such as ethnicity and gender.

In most DIF analyses the subgroups of interest are studied in pairs and are labeled as the *reference group* and the *focal group* (Roussos & Stout, 2004). The focal group represents the group of particular interest or the group of concern for the DIF analysis, whereas the reference group represents the norm or standard to whom the focal group is being compared. For this investigation, males were assigned as the reference group for comparison with the female focal group. Basketball was used as the reference group for its separate comparisons with the focal groups of ice hockey and swimming. For the comparison between ice hockey and swimming, ice hockey served as the reference group and swimming as the focal group. The assignment of sport as either reference or focal group was arbitrary and the overall results of the DIF analyses involving sport would be the same if the group assignments were reversed, only the direction (+/-) of the DIF statistic, beta, would change. After determining the statistical significance for each item by examining the p-value

associated with the calculated beta statistic, the sign of the beta statistic was examined to indicate which group was being favored by the item. A negative beta value indicates the reference group is being favored for the item, while a positive beta statistic indicates the focal group is being favored.

CHAPTER IV

RESULTS

This investigation examined the influences of athletic identity, expectation of toughness, and reported attitude toward pain and injury on instrumental and emotional social support help-seeking tendencies for the pains and injuries athletes experience during their participation in sports. This chapter discusses the results derived from the athletes' responses to the battery of survey instruments used in this investigation.

Descriptive Statistics and Demographic Information

Two hundred and twenty-two athletes representing two Midwestern NCAA Division III institutions completed the battery of survey instruments. Both institutions sponsored the intercollegiate sports of ice hockey, basketball, and swimming for both males and females. Of the total participants who took part in this investigation, 116 (52.3%) were male and 106 (47.7%) were female. Ninety-one (41.0%) participants were current roster members for the ice hockey teams, 62 (27.9%) participants were current roster members on the basketball teams, and 69 (31.1%) participants were current roster members of the swimming teams. Overall, participants ranged in age from 18 to 26 years, with an average age of 20.1 (SD=1.51). Participants included athletes who identified their current participation status in sport as playing rarely (N=19, 8.6%), playing sometimes (N=36, 16.3%), playing often (N=69, 31.2%), and starters (N=97, 43.9%). One athlete did not respond to the playing status item.

To briefly address injury history, participants were asked whether they had experienced pains or injuries resulting from participation in sport that required them to miss at least one month of participation in sport. Eighty-nine (40.1%) of the participants reported having experienced pain or injury that required them to miss at least one month of participation in sport. Significantly more male participants (48.3%) reported having missed at least one month of participation than female participants (31.1%) (Pearson Chi-Square=6.78, df=1, Asymp. Sig.=.009). (See Table 15 for frequency counts by gender.) Basketball participants reported having experienced injuries that involved a loss of one month of participation to a significantly greater extent than participants involved in swimming (Pearson Chi-Square=10.15, df=2, Asymp. Sig.=.006). (See Table 16 for frequency counts by sport.)

Table 15. Frequency counts (percentages) for missing one month by gender.

	Male	**Female**	**Total**
Yes	56 (25.2%)	33 (14.9%)	89 (40.1%)
No	60 (27.0%)	73 (32.9%)	133 (59.9%)
Total	116 (52.3%)	106 (47.7%)	222 (100%)

Table 16. Frequency counts (percentages) for missing one month by sport.

	Basketball	**Ice Hockey**	**Swimming**	**Total**
Yes	34 (15.3%)	36 (16.2%)	19 (8.6%)	89 (40.1%)
No	28 (12.6%)	55 (24.8%)	50 (22.5%)	133 (59.9%)
Total	62 (27.9%)	91 (41.0%)	69 (31.1%)	222 (100%)

In addressing severity of injury experienced by participants, participants were asked to indicate how long their most severe athletic injury kept them from participation in their sport. Significant differences were not found based on gender (Pearson Chi-Square = 8.626, df=4, Asymp. Sig.=.07), but were found based on sport (Pearson Chi-Square=17.66, df=8, Asymp. Sig.=.02). (See Table 17 for injury severity frequencies based on gender and Table 18 for injury severity frequencies based on sport.)

In all, 13 participants (5.9%) reported having experienced an athletic injury that kept them from participating in sport for more than six months, while 14 participants (6.4%) reported experiencing an athletic injury that kept them out of sport participation for three to six months. Forty-seven participants (21.5%) missed one to three months of sport participation due to athletic injury, 49 participants (22.4%) missed two weeks to one month, and 96 participants (43.8%) reported missing less than two weeks of sport participation due to athletic injury. Three participants did not respond to the item. It appears that male participants experience injuries requiring more time out of sport with 41.7% reporting having experienced pain or injury that kept them from sport at least 1 month compared to 25.7% of female participants who missed at least 1 month of sport due to pain or injury. Comparably, nearly half (46.7%) of participants involved in basketball reported having missed at least one month due to pain or injury, followed by 31.1% of hockey participants and 24.6% of swimming participants.

Interestingly, 171 participants (77.0%) reported that they had experienced pain or injury during their participation in sport for which they did not immediately seek assistance (i.e., played with it or attempted to “walk it off”), a key interest in this investigation. Failure to report pain or injury immediately did not differ based on gender of participants (Pearson Chi-Square=.01, df=1, Asymp. Sig.=.91), but a significant

difference was found based on sport (Pearson Chi-Square=9.43, df=2, Asymp. Sign.<.001). Fifty-six of 62 (90.3%) participants involved in basketball reported having not sought help immediately for pain and injury, compared to 63 of 91 (69.2%) of ice hockey participants and 52 of 69 (75.4%) of swimming participants. (See Table 19 and Table 20 for frequency of did not report injury based on gender and sport, respectively.)

Table 17. Frequency counts (percentages) for injury severity history by gender.

Injury Time Loss	Male	Female	Total
< 2 weeks	40 (18.0%)	56 (25.2%)	96 (43.2%)
2 weeks-1 month	27 (12.2%)	22 (9.9%)	49 (22.1%)
1 month-3 months	30 (13.5%)	17 (7.7%)	47 (21.2%)
3 months-6 months	8 (3.6%)	6 (2.7%)	14 (6.3%)
> 6 months	9 (4.1%)	4 (1.8%)	13 (5.9%)
Did not respond	2 (0.9%)	1 (0.5%)	3 (1.4%)
Total	116 (52.3%)	106 (47.7%)	222 (100.0%)

Table 18. Frequency counts (percentages) for injury severity history by sport.

Injury Time Loss	Basketball	Ice Hockey	Swimming	Total
< 2 weeks	17 (7.7%)	38 (27.2%)	41 (18.5%)	96 (43.2%)
2 weeks-1 month	15 (6.8%)	24 (10.8%)	10 (4.5%)	49 (22.1%)
1 month-3 months	16 (7.2%)	18 (8.1%)	13 (5.9%)	47 (21.2%)
3 months-6 months	5 (2.3%)	7 (3.2%)	2 (0.9%)	14 (6.3%)
> 6 months	7 (3.2%)	3 (1.4%)	3 (1.4%)	13 (5.9%)
Did not respond	2 (0.9%)	1 (0.5%)	0 (0.00%)	3 (1.4%)
Total	62 (27.9%)	91 (41.0%)	69 (31.1%)	222 (100.0%)

Table 19. Frequency counts (percentages) for did not report by gender.

	Male	Female	Total
Yes	89 (40.1%)	82 (36.9%)	171 (77.0%)
No	27 (12.2%)	24 (10.8%)	51 (23.0%)
Total	116 (52.3%)	106 (47.7%)	222 (100.0%)

Table 20. Frequency counts (percentages) for did not report by sport.

	Basketball	Ice Hockey	Swimming	Total
Yes	56 (25.2)	63 (28.4%)	52 (23.4%)	171 (77.0%)
No	6 (2.7%)	28 (12.6%)	17 (7.7%)	51 (23.0%)
Total	62 (27.9%)	91 (41.0%)	69 (31.1%)	222 (100.0%)

No significant differences were found for how bad the pain has to be to report based on gender or sport ($F=1.74$, $p=.19$; $F=.87$, $p=.42$, respectively). Additionally, no significant differences were found for how likely participants were to play through pain and injury based on sport ($F=.85$, $p=.77$). However, a significant mean difference was found for how likely participants were to play through pain and injury based on gender ($F=4.54$, $p=.03$, $ES=.02$), with female participants reporting a greater likelihood of playing through pain and injury than male participants. Group means for the item are available in Table 21 based on group (gender and sport).

Table 21. Group means (standard deviations) and *response ranges* for how bad pain has to be to report and how likely to play through pain. (Scale of 1 to 5, with 1 = pain free and 5 = worst pain ever experienced.)

	Male	Female	Basketball	Ice Hockey	Swimming	Total
How bad pain	3.38	3.53	3.47	3.37	3.54	3.45
to report	(.76)	(.71)	(.72)	(.81)	(.66)	(.74)
Response Range	*1-5*	*1-5*	*2-5*	*1-5*	*2-5*	*1-5*
Likely to play	3.97	4.18	4.03	4.14	4.01	4.07
through pain	(.76)	(.74)	(.71)	(.75)	(.81)	(.76)
Response Range	*2-5*	*2-5*	*3-5*	*2-5*	*2-5*	*2-5*

Data Analysis

The research findings of this investigation are discussed in three sections. The first section focuses on Research Question 1 and addresses the results found through structural equation modeling analysis and regression statistical analysis. The second section focuses on Research Question 2a and the results of multivariate analysis of variance (MANOVA) analyses based on group (gender and sport) on each of the measures. The third section reviews the findings for Research Question 2b addressing the presence of DIF on the survey items of the RPII Tough subscale and SIP TCR scale based on group (gender and sport).

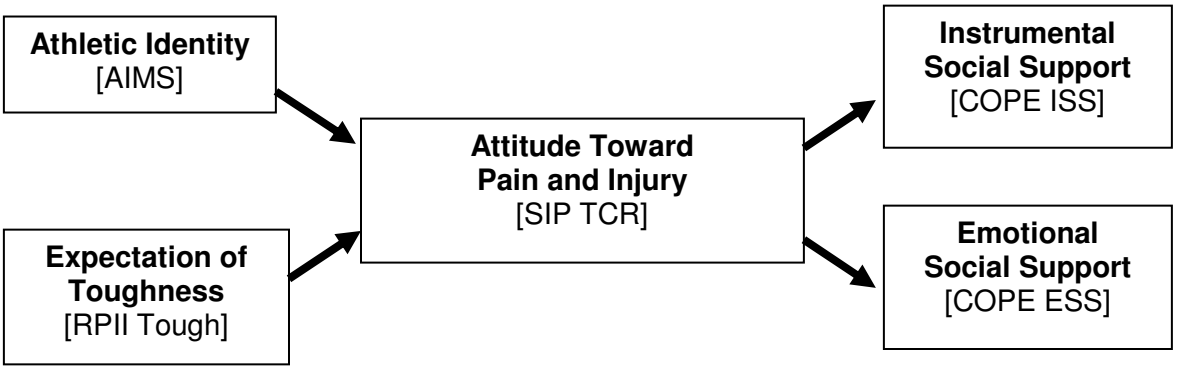
Research Question 1

Research Question 1 addresses the relationships among athletic identity, expectation of toughness, reported attitude toward pain and injury, and athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries experienced during sport participation. Two analyses were performed. The first analysis determined the relationships of the predictors of athletic identity and expectation of

toughness to reported attitude toward pain and injury, and the predictors of attitude toward pain and injury to athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries. See Figure 10. The second analysis examined the relationship of the collective predictors of athletic identity, expectation of toughness, and attitude toward pain and injury on athletes' instrumental and emotional social support help-seeking tendencies.

To investigate the Research Question 1a LISREL 8.3 was used to test the fit of the model seen in Figure 10 (Joreskog & Sorbom, 2000). The correlation matrix of observed variables was used for the analysis. The proposed model in Figure 10 did not exhibit adequate fit according to the model's fit indices, Chi-Square=87.44 (df=5, p<.001), RMSEA=0.28, CFA = 0.59, Standardized RMR = 0.15, and AGFI = 0.59. Due to the lack of fit, no further comparisons were made with the model.

Figure 10: Primary Structural Path Analysis Model Statistical Analysis



Although the model was not a good fit, multiple regressions did exhibit the presence of several significant predictive relationships. A significant predictive relationship was found between attitude toward pain and injury and instrumental social support help-seeking tendencies ($t=-2.96$, $p=.003$), with an explained variance of 7%. Furthermore, attitude toward pain and injury was found to have a significant predictive relationship with emotional social support help-seeking tendencies ($t=-2.78$, $p=.006$), explaining 8% of the variance. In addition, expectation of toughness was found to be a significant predictor of attitude toward pain and injury ($t=10.68$, $p<.001$), explaining 37% of the variance, and athletic identity was found to be a significant predictor of expectation of toughness explaining 14% of the variance ($t=5.87$, $p<.001$). Although the proposed structural equation model did not indicate good fit, results of the regression analyses indicate the presence of significant relationships warranting further analyses. (See Table 22 for regression results.)

Research Question 1b examined the predictive relationships among athletic identity, expectation of toughness, and attitude toward pain and injury on athletes' instrumental and emotional social support help-seeking tendencies for pains and injuries. Factor analysis to support the use of the proposed two factors was performed first. Next, correlations were calculated for the five constructs used with the proposed structural regression model.

Principal components factor analysis of the five constructs supported the use of the proposed two-factor structural model. The two-factor model had an eigenvalue of 1.31 and explained 70.13% of the variance. (See Table 23.) Factor loadings using Varimax rotation for the second factor supported the use of athletic identity (.71), expectation of toughness (.86), and attitude toward pain and injury (.72) within the

second factor. The first factor included the instrumental and emotional social support help-seeking tendencies with factor loadings of .90 and .88, respectively, and supported the use of instrumental and emotional social support help-seeking within a second factor. (See Table 24.)

Table 22. Regression Analyses Statistics (***** indicates significance p<.05)

Dependent Variable	Predictor	F	Standard. Beta	t
COPE ISS		6.76*		
	AIMS		0.07	1.06
	RPII TOUGH		-0.09	-1.02
	SIP TCR		-0.24	-2.96*
COPE ESS		6.41*		
	AIMS		0.02	0.23
	RPII TOUGH		-0.09	-1.02
	SIP TCR		-0.23	-2.78*
SIP TCR		62.71*		
	AIMS		-0.05	-0.80
	RPII TOUGH		0.62	10.68*
RPII TOUGH		34.41*		
	AIMS		0.05	5.87*

Table 23. Principal Components Analysis for Five Constructs

	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	2.20	43.98	43.98
2	1.31	26.16	70.13
3	0.78	15.67	85.80
4	0.36	7.23	93.03
5	0.35	6.97	100.0

Table 24. Constructs Factor Loadings with Varimax Rotation

	Component 1	Component 2
AIMS	.17	.70
RPII TOUGH	-.19	.86
SIP TCR	-.35	.72
COPE ISS	.90	-.06
COPE ESS	.88	-.13

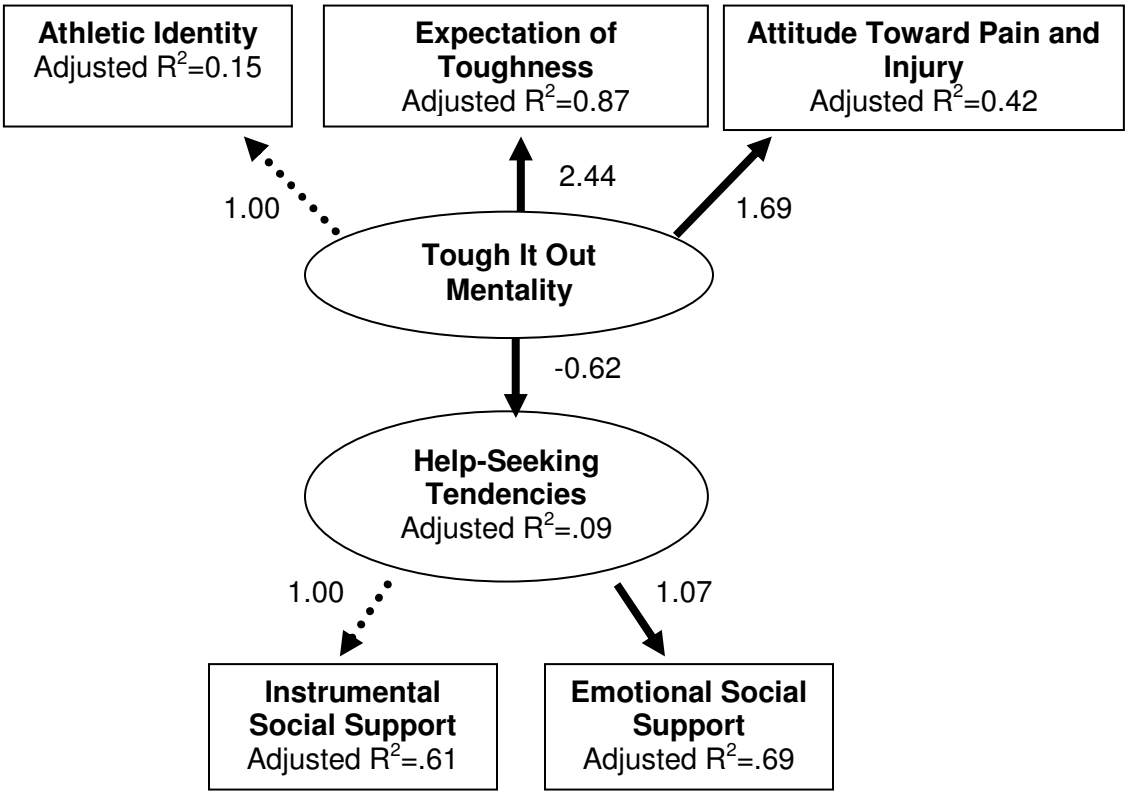
Results from a structural regression model using the correlation matrix (see Table 25), which tested the presence of two latent factors for the five constructs, indicated questionable model fit. Specifically, Comparative Fit Index (CFI) = 0.98, Adjusted Goodness of Fit Index (AGFI) = 0.92, and Standardized Root Mean Square Residual = 0.05 indicated acceptable model fit. In contrast, the Root Mean Square Error of Approximation (RMSEA) did not indicate acceptable fit with a value of 0.10 and the Normal Theory Weighted Least Square Chi-Square value was found to be significant (Chi-Square=11.89, df=4, p-value=0.018) indicating inadequate fit.

Table 25. Correlation Matrix for Measures used in Structural Regression Model. (Reliability coefficients in diagonal.)

Measure	AIMS	RPII Tough	SIP TCR	COPE ISS	COPE ESS
AIMS 10 items	*0.81*				
RPII Tough 11 items	0.37	*0.80*			
SIP TCR 17 items	0.18	0.60	*0.82*		
COPE ISS 4 items	0.01	-0.21	-0.27	*0.86*	
COPE ESS 4 items	-0.06	-0.22	-0.28	0.65	*0.79*

Parameter estimates for the model were also estimated. Parameters for athletic identity (AIMS) and instrumental social support (ISS) were fixed at 1.00 to allow the other parameters to be estimated and maintain positive degrees of freedom. As proposed, all direct pathways in the structural model were found to be significant, as all t-values were greater than +/-1.96. Significant path coefficients were found between the latent variable *Tough It Out Mentality* and the observed variables of expectation of toughness (RPII Tough) and attitude toward pain and injury (SIP TCR), t=3.67 and t=4.35, respectively. The Squared Multiple Correlations for the observed variables linked to the Tough It Out latent variable were 0.15 for athletic identity (AIMS), 0.87 for expectation of toughness (RPII Tough), and 0.42 for attitude toward pain and injury (SIP TCR). In relation to the *Help Seeking Tendencies* latent variable, a significant path coefficient was found in its relationship with the ESS observed variable (1.07, t=3.42) with 69% of the variance explained for the ESS observed variable and 61% of the variance explained for the ISS observed variable. A significant path coefficient was also found linking the two latent variables (-.62, t=-2.47) and a Squared Multiple Correlation for Help Seeking Tendencies was .09.

Figure 11. Alternate Structural Regression Model Statistical Analysis Result



Research Question 2

Research Question 2a involved the use of multivariate analysis of variance to determine whether significant mean differences were present for athletic identity, expectation of toughness, attitude toward pain and injury, and instrumental and emotional social support help-seeking tendencies based on gender (i.e., male athletes and female athletes), sport (i.e., ice hockey, basketball, and swimming), and the interaction of gender and sport. (See Table 26 for MANOVA Analyses Results and Table 27 for means and standard deviations for measures based on group.)

Based on gender, although no significant mean differences were found on athletic identity or attitude toward pain and injuries, significant gender differences were found on expectation of toughness ($F=6.45$, $p=.01$, $ES=.03$), instrumental social support ($F=11.38$, $p<.001$, $ES=.05$), and emotional social support ($F=30.70$, $p<.001$, $ES=0.13$). Specifically, male participants (mean = 29.30, SD=3.91) were found to have significantly greater levels of expectation of toughness than female participants (mean=27.79, SD=4.22). As expected, male participants scored significantly lower on both instrumental social support (mean=10.54, SD=2.16) and emotional social support (mean=8.76, SD=2.39) help-seeking than female participants (mean=11.59, SD=2.75; mean=10.65, SD=3.03, respectively) in this investigation. The only significant difference found for the interaction of gender and sport involved emotional social support help-seeking tendencies comparing men's and women's basketball ($F=3.59$, $p=.03$, $ES=.03$). Male basketball participants reported significantly lower levels of emotional social support help-seeking tendencies (mean=8.13, SD=2.32) than female basketball participants (mean=11.13, SD=2.47).

Significant mean differences were found based on sport for athletic identity ($F=13.88$, $p<.001$, $ES=0.12$) and expectation of toughness ($F=6.44$, $p<.001$, $ES=.06$). Overall, participants involved in basketball (mean=36.22, SD=5.09) and ice hockey (mean=37.37, SD=5.02) were found to identify themselves more strongly as athletes than participants involved in swimming (mean=32.86, SD=5.82). There were no significant differences between athletes participating in basketball and ice hockey or swimming athletes on degree of athletic identification. In regards to expectation of toughness, participants involved in ice hockey (mean=29.77, SD=4.05) were found to have significantly greater levels of expectation of toughness than participants involved in

basketball (mean=28.03, SD=3.31) and swimming (mean=27.49, SD=4.51). No significant mean differences were found on attitude toward pain (TCR) or instrumental and emotional social support help-seeking tendencies based on sport.

Table 26: MANOVA Analyses Results (* indicates significance p<.05)

Measure		F	Partial Eta Squared	Observed Power
AIMS				
	x Gender	0.52	0.00	0.11
	x Sport	13.88*	0.12	1.00
	Gender x Sport	1.53	0.01	0.32
RPII Tough				
	x Gender	6.45*	0.03	0.72
	x Sport	6.44*	0.06	0.90
	Gender x Sport	0.04	0.00	0.06
SIP TCR				
	x Gender	0.01	0.00	0.05
	x Sport	0.41	0.00	0.12
	Gender x Sport	0.92	0.01	0.21
COPE ISS				
	x Gender	11.38*	0.05	0.92
	x Sport	0.86	0.01	0.20
	Gender x Sport	2.11	0.02	0.43
COPE ESS				
	x Gender	30.70*	0.13	1.00
	x Sport	0.08	0.001	0.06
	Gender x Sport	3.59*	0.03	0.66

Table 27: Group Means (standard deviations) for measures.

Measure	Male	Female	Basketball	Ice Hockey	Swimming	Total
AIMS	36.06 (5.56)	35.17 (5.68)	36.22 (5.09)	37.37 (5.02)	32.86 (5.82)	35.63 (5.63)
RPII Tough	29.30 (3.91)	27.79 (4.22)	28.03 (3.31)	29.77 (4.05)	27.49 (4.51)	28.57 (4.13)
SIP TCR	33.33 (7.02)	33.55 (7.47)	33.18 (6.13)	33.90 (7.23)	33.06 (8.13)	33.44 (7.23)
COPE ISS	10.54 (2.16)	11.59 (2.72)	11.43 (2.28)	10.97 (2.43)	10.83 (2.75)	11.05 (2.94)
COPE ESS	8.76 (2.39)	10.65 (3.02)	9.69 (2.84)	9.56 (2.60)	9.79 (3.25)	9.67 (2.87)

In addressing Research Question 2b, statistical analyses were performed on the items of the RPII Tough subscale and SIP TCR composite scale to determine if differential item functioning (DIF) was present. DIF occurs in an item when participants from different subgroups differ in their expected score on the item (Roussos & Stout, 2004). Analyses were performed based on group memberships of gender and sport on the scale items. For gender, males were assigned as the reference group, while females represented the focal group in this investigation. Separate comparisons were performed based on sport. Basketball was assigned as the reference group for comparisons with focal groups of ice hockey and swimming, respectively. Ice hockey was assigned as the reference group in its comparison with swimming, the focal group. Interestingly, DIF was found to be present on a number of items based on the gender and sport of participants. (See Table 20 for RPII Tough DIF findings and Table 21 for SIP TCR DIF findings.)

Participants involved in ice hockey were favored for the statement “No pain, No gain” compared to participants involved in swimming ($B=-.52$, $p<.001$). Participants

involved in basketball were favored regarding the item addressing expectation that athletes who endure pain and play hurt deserve respect compared to participants involved in swimming (B=-.70, p<.001), while participants in swimming were favored based on their responses that serious athletes have to play with injuries and pain (B=.35, p=.008) compared to participants in basketball. When asked whether athletes should “tough it out” with pain and injury regardless of long-term effects, participants involved in swimming were favored in comparison to participants involved in ice hockey (B=.95, p<.001), and participants in ice hockey were favored on the same item in comparison to participants involved in basketball (B=.19, p=.04). Participants in ice hockey (B=-.28, p=.004) and basketball (B=-.30, p=.002) were favored for the item indicating that athletes should ignore pain in comparison to participants involved in swimming. Participants involved in swimming were favored for the item indicating that winning is everything in sport compared to participants involved in ice hockey (B=.53, p<.001) and participants involved in basketball (B=.59, p<.001).

DIF was found to occur on three of the RPII Tough subscale. Male participants were favored for the item indicating that athletes should “tough it out” with an injury or pain and not worry about the effects tomorrow (B=-.18, p=.02) compared to their female counterparts, and males were also favored for the item indicating that athletes should ignore pain (B=-0.18, p=.03) compared to females. Female participants were favored for the item indicating that winning is everything in sport compared to male participants (B=.324, p=.003).

DIF was also found on several items included in the SIP TCR composite scale based on group (gender and sport). (See Table 29.) Based on sport comparisons, participants involved in basketball were favored for the item addressing that pain is

viewed as a challenge and that it doesn't bother them in comparison to participants involved in swimming (B=-1.20, p<.001). Participants involved in basketball were also favored for the item that indicated the use of mind games with themselves to keep their mind off the pain (B=-.66, p<.001) and for the item suggesting that when hurt they just go on as if nothing happened (B=-.48, p=.02) compared to participants involved in swimming. In turn, participants involved in swimming were favored for the items addressing the use of prayer to stop the pain when injured (B=.76, p=.30) and the idea that they are more interested in returning to sport than trying to stop the pain (B=1.09, p<.001) than participants involved in basketball. Participants in swimming were favored on the item indicating that pain is just part of the game than participants in ice hockey (B=.68, p<.001), and participants in swimming were also favored in their responses that when in pain they often feel that they can't stand it in comparison to participants involved in basketball (B=.63, p<.001). Participants involved in ice hockey were favored in their responses to the item suggesting that when injured, they tell themselves to be tough and carry on (B=.26, p=.03) and were also favored for the item indicating that when in pain, they tell themselves it doesn't hurt (B=.24, p=.04) than participants involved in basketball.

Table 28: DIF Results for RPII Tough Items (Favored Group in **Bold.**)

	RPII Item	Reference Group	Focal Group	Beta	Standard Error	p-value
2	No pain, no gain	**Ice hockey**	Swimming	-.52	.10	<.001
3	Athletes who endure pain and play hurt deserve our respect.	**Basketball**	Swimming	-.70	.11	<.001
7	Serious athletes have to play with injuries and pain.	Basketball	**Swimming**	.35	.13	.008
10	Athletes should "tough it out" with an injury or pain and not worry about the effects tomorrow.	Ice hockey	**Swimming**	.95	.11	<.001
		Basketball	**Ice hockey**	.19	.09	.043
		Male	Female	-.18	.08	.019
11	Coaches only care about their players who are healthy and able to play.	**Basketball**	Ice hockey	-.25	.10	.015
14	Athletes should ignore pain.	**Ice hockey**	Swimming	-.28	.10	.004
		Basketball	Swimming	-.30	.10	.002
		Basketball	**Ice hockey**	.79	.10	<.001
		Male	Female	-.18	.09	.034
28	In sport, winning is everything.	Ice hockey	**Swimming**	.53	.13	<.001
		Basketball	**Swimming**	.59	.12	<.001
		Male	**Female**	.32	.11	.003

Table 29: DIF Results for SIP TCR Items (Favored group in **Bold.**)

	SIP Item	Reference Group	Focal Group	Beta	Standard Error	p-value
1	I see pain as a challenge and it doesn't bother me.	**Basketball**	Swimming	-1.20	.23	<.001
3	When in pain, I tell myself it doesn't hurt.	Basketball	**Ice hockey**	.24	.12	.041
4	When injured, I pray for the pain to stop	Basketball	**Swimming**	.76	.30	<.011
7	At this point, I am more interested in returning to my sport than trying to stop the pain.	Basketball	**Swimming**	1.09	.22	<.001
12	Pain is just a part of the game.	Ice hockey	**Swimming**	.68	.14	<.001
13	When hurt, I play mental games with myself to keep my mind off the pain.	**Basketball**	Swimming	-.66	.18	<.001
17	When I am hurt, I just go on as if nothing happened.	**Basketball** Male	Swimming **Female**	-.48 .25	.21 .13	.018 .045
19	If in pain, I often feel I can't stand it anymore.	Basketball	**Swimming**	.63	.18	<.001
22	When injured, I tell myself to be tough and carry on.	Basketball	**Ice hockey**	.26	.12	.029

General Conclusions

In summary, there were a number of significant findings in this investigation. First, within the primary research question, it is clear that the toughness aspect of the sport ethic and attitude toward pain and injury aspects addressed within this investigation negatively influence athletes' help-seeking tendencies for the pains and injuries experienced in sport. In addressing the first aspect of the second research question, significant mean differences were found for athletic identity (by sport),

expectation of toughness (by gender and by sport), instrumental social support help-seeking tendencies (by gender), and emotional social support help-seeking tendencies (by gender). Finally, a number of items on the RPII Tough subscale and SIP TCR scale exhibited differential item functioning based on gender and group.

CHAPTER V

DISCUSSION

Research addressing the role of the sport ethic in relation to emotional and behavioral responses following athletic injury is limited. In addition, previous research addressing the psychological aspects of sport injury has most often addressed single constructs or the relationship between two constructs rather than looking at the relationships and potential interactions among a number of constructs within the conceptual model. The constructs addressed most often are those personal factors within the Wiese-Bjornstal et al. integrated model (1998). Therefore, the purpose of the current project was to begin to address how the sport ethic, a social-situational factor identified within the model, along with athletic identity and attitude toward pain and injury, influences athletes' willingness to seek help for the pains and injuries experienced during sport.

The influences of athletic identity, expectation of toughness, and reported attitude toward pain and injury on help-seeking tendencies were examined with two alternative models and differences in the key constructs by gender and sport were also investigated. This discussion of the findings begins with a brief discussion of the demographics for the sample including injury history, injury reporting, and help-seeking tendencies. Next, the findings are discussed as they are related to the research questions. First, the findings for the proposed alternate models that address the relationships among athletic identity, expectation of toughness, athletes' attitudes toward

pains and injuries and athletes' help-seeking tendencies are discussed. Next, significant gender and sport differences on the constructs are addressed. Subsequently, results for Differential Item Functioning for the items of the RPII Tough and SIP Total Coping Response scales are discussed. Finally, the strengths and limitations of the current investigation, future directions, and potential practical implications are discussed.

Demographics

Of particular interest in this investigation, two questions were directed toward participants' injury history. The first question asked whether participants had experienced pain or injury resulting from their participation in sport that required them to miss at least one month of participation in sport. Less than half of the participants (40.1%) indicated they had experienced pain or injury that limited their involvement in sport for one month, which would represent severe injury. No significant differences were found between basketball and ice hockey or between ice hockey and swimming on injury severity, but more basketball participants reported having experienced injuries that required at least one month out of sport compared to swimming participants. With the higher rates for injury incidences in ice hockey seen in the NCAA ISS injury data, these findings may indicate that the injuries experienced in ice hockey may be less severe, as they are related to time loss from sport, than those resulting from participation in basketball. It may also suggest that participants in ice hockey return more quickly from injury than participants in basketball, which would be consistent with the expectations of toughness and culture of sacrifice seen within the sport of hockey.

The second question related to injury history asked participants how long their most severe athletic injury kept them from participation in their sport. Significant gender

differences were found with male participants reporting greater time loss due to injury than female participants. Differences were also noted based on sport with a greater number of basketball participants experiencing greater time out of sport than swimming participants. These results may relate to the physical nature of male sports, in particular ice hockey and basketball that commonly lead to acute injuries that require time out of sport for recovery. However, it was anticipated that greater differences would be noted between ice hockey and swimming. It may be, as was discussed with the previous question, that ice hockey participants experience less severe injuries or they push their recovery and therefore are quicker to return to sport following injury.

Interestingly, more than three-quarters of the participants involved in this investigation reported that they had experienced pain or injury during their participation in sport for which they did not immediately seek help. Many of these athletes reported having attempted to play with the pain or "walk it off", behaviors commonly seen in sport. The injury incidence statistics cited within the literature require participants to have reported the injury to appropriate personnel for the incident to be counted (NCAA, 2006; Powell & Dompier, 2002). The finding in this investigation that less than 25% of participants immediately report their pains or injuries is worrisome. When athletes attempt to play through pain, they are placing their health at risk if their perception of the injury severity is incorrect. Just as there are issues with defining "injury" within research, it may also be difficult for athletes to make the distinction between pain and actual injury when participating in sport. A distinction is often made that athletes are expected to play hurt, but may not be expected to play injured. Making the distinction is difficult and many athletes may fail to make the appropriate injury severity assessment, placing themselves at risk for further injury and long-term disability.

In reference to the item addressing immediate reporting of pains and injuries, it appears that basketball participants reported significantly greater tendencies to not immediately report pain or injury than hockey or swimming participants. The difference between basketball and swimming was expected, as swimming participants rarely experience acute, direct trauma-related injuries and more often experience chronic pain and injury. Making the distinction between usual pain and that requiring medical attention can be difficult. Basketball participants experience more acute injuries, turned ankles and jammed fingers that may not be easy to distinguish as significant, and they may try to shake or walk off. However, the difference between basketball and hockey participants is surprising. One possibility is that it is easier for hockey participants to make regular shift changes and make their way to the bench when they experience pain, where assistance is readily available or where they have time to determine the extent of the injury, without being taken out of the game and without losing any playing time. In contrast, basketball participants must be removed from their regular play to seek assistance, which would mean a loss in playing time and the potential for being seen as weak or as damaged.

Two additional items were included to address how bad the pain had to be before the participants were willing to seek help and for how likely participants were to play through pain and injury in sport. No significant differences were found based on gender and sport. One modification that may be used in the future is to use a pain scale of one to ten, which is common within the medical professions, and may pick up differences not seen with a scale ranging from one to five. This finding also raised a question as to whether a distinction between acute and chronic pain is necessary in future investigations. Although the intent of this investigation was to address athletes'

tendencies to report acute injury, it may be that athletes, particularly athletes in the sports where chronic pains and injuries are most common, do not make the distinction between acute and chronic pains and may delay in seeking help for chronic pain until it becomes unbearable. Future research may benefit from making a clear distinction between acute and chronic pains and injuries when examining issues related to athletes' responses to injuries, as well as when addressing athletes' compliance to rehabilitation programs.

Research Question 1

Research Question 1 examines the relationships among athletic identity, expectation of toughness, attitude toward pain and injury and social support help-seeking tendencies for pains and injuries experienced during sport. Although the constructs have previously been researched individually, previous research has not examined the potential interrelationships among them.

Research Question 1a

The first model examined within Research Question 1 proposed athletic identity and expectation of toughness, together, influence athletes' attitudes toward pain and injury, which in turn influences instrumental and emotional social support help-seeking tendencies. The model was developed through the interpretation of the Wiese-Bjornstal et al. (1998) model, which demonstrates that personal and situational factors influence cognitive appraisal, which in turn affects emotional and behavioral responses. This model was supported during pilot work through regression analyses as discussed within Chapter 3. Despite previous findings, the proposed structural path model did not show adequate fit upon examination of the fit indices for this investigation.

However, through multiple regression analyses, a number of significant relationships were found. Attitude toward pain and injury was a significant predictor of both instrumental and emotional social support help-seeking tendencies. In contrast to the proposed model that athletic identity and expectation of toughness both predict attitude toward pain and injury, the regression analysis found only expectation of toughness to be a significant predictor of attitude toward pain and injury. Consequently, athletic identity was found to be a significant predictor of expectation of toughness. This finding may be due to inclusion of only collegiate level athletes in this investigation and the limited variability in scores on athletic identity. Overall, these results indicate that athletic identity, expectation of toughness, and attitude toward pain and injury likely influence athletes' help-seeking tendencies either directly or indirectly, but also suggest that additional personal and situational factors likely play a role in athletes' willingness to seek help for the pains and injuries experienced during sport.

Research Question 1b

The second structural model tested in this investigation proposed two latent variables within the five observed variables. It was proposed that together, athletic identity, expectation of toughness, and attitude toward pain and injury form the latent variable *Tough It Out Mentality*, which influences athletes' *Help-Seeking Tendencies* represented by instrumental and emotional social support help-seeking. Because research addressing the links between the personal and social factors and help-seeking tendencies is limited, this alternative model was proposed based on findings during the pilot study indicating the presence of two factors within the five observed variables.

The alternative model demonstrated acceptable fit. Specifically, expectation of toughness and attitude toward pain and injury were shown to have significant

relationships with the latent variable, represented as the *Tough It Out* Mentality. Expectation of toughness demonstrated the strongest relationship with the latent variable with a path coefficient of 2.44 and 87% of its variance explained. Attitude toward pain and injury also demonstrated a significant relationship with the Tough It Out latent variable with a path coefficient of 1.69 and 42% of the variance explained. Based on these findings, it appears that expectations of toughness and attitude toward pain play a greater role in help-seeking tendencies than athletic identity. Future research may be warranted to address where athletes learn these expectations and also examine if anything can be done to buffer their influence on athletes' help-seeking tendencies for the pains and injuries experienced in sport. However, it may be possible that athletic identity has greater influence on help-seeking tendencies when comparing populations that have a greater variability on the measure, such as comparing athletes and non-athletes or intercollegiate athletes and recreational athletes. Because all of the participants involved in this investigation were NCAA Division III student-athletes, the score distribution for athletic identity was negatively skewed with 85.6% of participants exhibiting scores greater than 30 for strength of athletic identification and 58.9% of participants exhibiting scores greater than 35. The role of athletic identity may not come through as strong in this investigation involving only an athletic population where most individuals identify themselves more strongly as athletes, as compared to a sample involving non-athletic populations. Within this sample, the mean for athletic identity was 35.6 (SD=5.64) from a possible score range of 10 to 50. Only nine participants (4.1%) scored 25 and lower on athletic identity (AIMS).

Most importantly, a significant negative relationship was found between the latent variables, suggesting as athletes agreed more with the aspects related to the *Tough It*

Out Mentality, they reported less help-seeking tendencies for the pains and injuries experienced. Together, the observed variables included within the *Tough It Out Mentality* latent variable explained only 9% of the variance of *the Help-Seeking Tendencies* latent variable. This appears to be rational in that as participants indicated greater levels of expectation of toughness and greater attitudes that pain was expected and to be played through, participants reported significantly less help-seeking. These participants likely used other coping strategies to deal with the pains and injuries that were not a focus of this investigation. Wasley and Cox (1998) found that chronically injured athletes scored higher on Escape/Avoidance and lower on Seeking Social Support than athletes who experienced acute injuries. Future research should address additional coping strategies used by athletes. However, the primary focus of this investigation was specific to the influence of the sport ethic on instrumental and emotional social support help-seeking tendencies related to pain and injury.

In terms of help-seeking tendencies, a significant path was found between emotional social support help-seeking and the Help-Seeking Tendencies latent variable. Therefore, it appears that emotional social support is more central to the Help-Seeking Tendencies latent variable than instrumental social support, and as a result is more affected by the components included in the *Tough It Out Mentality* latent variable. These findings suggest that athletes who have greater levels of expectation of toughness and who view pain and injury as something that should be ignored or played through are slightly less likely to seek emotional social support for the pains and injuries they experience during sport than they are to seek instrumental social support. Overall, expectation of toughness and attitude toward pain and injury were found to influence instrumental and emotional social support help-seeking to a similar extent. To extend

this line of research, Nixon (1994a) refers to key personnel within the sport culture that may influence athletes' thoughts and behaviors as the sportsnet, including coaches, teammates, and athletic trainers. Additional research may be performed to address specifically where athletes seek instrumental and emotional social support for their pains and injuries. It would be preferred from a health standpoint that athletes seek instrumental social support for pains and injuries from team personnel who are more qualified to evaluate and assess the injury, such as athletic trainers rather than relying on coaches and teammates for such information.

Summary

Overall, this investigation suggests that athletic identity, expectation of toughness, and attitude toward pain and injury do play a significant role in athletes' willingness to seek help for pains and injuries. Expectation of toughness and attitude toward pain and injury, in particular, made the largest contributions to the negative relationship with help-seeking tendencies. On the other hand, it is clear that additional factors also influence whether athletes seek help for the pains and injuries experienced during sport participation. Referring back to the Wiese-Bjornstal et al. (1998) model, a number of personal and situational factors likely influence athletes' cognitive appraisals and subsequent emotional and behavioral responses to athletic injuries. Additional situational factors that may be addressed include time of season, level of competition, whether the injury occurs during practice vs. game settings and accessibility to medical care. The intent of this investigation was to begin to identify the role of the expectation of toughness aspect of the sport ethic and its influence on help-seeking tendencies for pain and injury. It is clear that the expectation of toughness aspect of the sport ethic addressed in this investigation, together with athletic identity and attitude toward pain

and injury, negatively influences athletes' overall help-seeking tendencies for the pains and injuries experienced during sport.

Research Question 2

Research Question 2 focused on identifying differences in athletic identity, expectation of toughness, and instrumental and emotional social support help-seeking tendencies based on group (gender and sport). Research Question 2 also examined whether differential item functioning was present for the items of the RPII Tough subscale and SIP TCR scale.

Research Question 2a

Research Question 2a focused on identifying differences based on gender and sport for athletic identity, expectation of toughness, attitude toward pain and injury, as well as instrumental and emotional social support help-seeking tendencies.

Athletic Identity

It was hypothesized that significant differences would be found based on gender, but not for sport. In contrast to the hypothesis, there were no significant differences in athletic identity based on gender. All participants in this investigation were NCAA Division III athletics, which does not involve athletic scholarships. It is possible that greater differences would be noted between athletes representing different NCAA Divisions and between scholarship and non-scholarship athletes. Additional differences will also likely be present for comparisons between athletes and non-athletes or between intercollegiate or professional athletes and recreational athletes.

Significant mean differences in athletic identity were found based on sport, with participants in basketball and ice hockey reporting greater identification of themselves as

athletes than participants in swimming. One possible explanation for this difference is the typical spectator following of the sports. In general, college ice hockey arenas and basketball gymnasiums, even at the Division III level, are designed for larger numbers of spectators. However, the swimming facilities often limit the number of spectators able to watch an event. This discrepancy was particularly obvious at the two institutions where participants were recruited for this investigation. In addition to spectator following of the sport, sports information departments on many college campuses often do more to promote and provide a greater awareness of the basketball and ice hockey teams and their events compared to swimming. Thus, the participants in these sports may be seen more prominently as athletes by others within the campus setting and surrounding community. Along those lines, college radio and television stations commonly broadcast ice hockey and basketball games, while seldom, if ever, do they broadcast swimming events, further promoting the prominence of specific sports and their athletes on college campuses.

Expectation of Toughness

Significant mean differences were noted for expectation of toughness based on gender and sport. As hypothesized, male participants reported significantly higher expectations of toughness compared to their female counterparts. This was consistent with the hypothesis and may be due to the more physical nature of male sports. In particular, men's ice hockey and basketball involve greater physical contact and have increased injury risk, compared to their female counterparts. The unwillingness by participants to make physical sacrifices for the game may lead to a questioning of the participant's masculinity and may also affect their acceptance within a sport culture that is based on toughness and sacrifice (Messner, 1990; Young et al. 1994). The

maintenance of the participant's masculinity is likely to be important for all male athletes, but most importantly for males participating in the more physical sports, such as basketball and ice hockey.

In addition to gender differences, significant mean differences were also found for the expectation of toughness based on sport, with participants in ice hockey reporting significantly greater levels of expectation of toughness than participants in basketball and swimming. There is imminent physical contact when participating in a physical sport, such as ice hockey. It is possible that for athletes to make it to the collegiate level of competition in sport, a certain level of toughness and sacrifice is needed in sports such as ice hockey to be recruited and retained on the teams. Men's ice hockey, specifically, involves checking, with blatant and often violent physical contact viewed as just a part of the game. Although physical contact is a part of men's and women's basketball and women's hockey games, it is not as structured within the game as it is in men's ice hockey, which allows legal full body checking. Equivalent physical contact to the check in men's ice hockey within the sport of basketball would likely result in a personal foul, if not a technical foul and a penalty within the women's hockey competition. Often within the sport of men's ice hockey, as long as the contact is seen as instrumental in nature, with the intent to obtain or maintain control of the puck, the physical contact is considered legal and acceptable. To withstand the physical consequences of the regular physical contact involved in these sports, a certain level of toughness and willingness to make sacrifices is necessary.

Attitude Toward Pain and Injury

No statistically significant differences were found for attitude toward pain and injury based on gender or sport. Although participation in sports, such as ice hockey and

basketball, involve a greater risk of acute and catastrophic injury, participants in sports such as swimming commonly experience chronic, overuse injuries. Often times, it is these chronic injuries that require participants to establish additional coping strategies and attitude toward pain that allows them to participate despite the pain. Mentally, some athletes may convince themselves that it doesn't hurt or that it isn't serious and make a conscious effort to go on as if nothing happened. It is therefore possible that all athletes establish functional attitudes toward pain that allows them to continue participating in sport regardless of the discomfort or pain they are experiencing.

Help-Seeking Tendencies

With help-seeking tendencies for pain and injury, significant mean differences were found based on gender, but not based on sport. Female participants reported significantly more instrumental and emotional social support help-seeking tendencies for pains and injuries than male participants. This is consistent with previous research that has found that males are less likely than females to use social support in coping (Henert, 2001, Husaini et al., 1994; Neighbors & Howard, 1987). The willingness for males to seek help or admit they are experiencing pain or injury may bring into question their perceived masculinity and expectation of toughness related to sport. In this investigation, both genders reported seeking less emotional social support than instrumental social support for the pains and injuries experienced during sport. Within the context of sport injury, this suggests that athletes are more willing to seek information assistance to find out what is wrong and what needs to be done than to seek help that will allow them to express their thoughts and feelings about an injury.

Research Question 2b

Research Question 2b addresses whether differential item functioning (DIF) was present on the items of the RPII Tough and SIP TCR scales based on group. DIF is present in an item when people from different groups with the same ability have a different likelihood to give a particular response (Embretson & Reise, 2000). DIF was found to be present on six items based on sport and three items based on gender for the items of the RPII Tough subscale. Although significant mean differences were not found for the overall SIP TCR scale, nine items were found to exhibit DIF based on sport, while one item of the SIP TCR scale was found to present DIF based on gender.

DIF Results: RPII Tough Subscale

In regards to the items of the RPII Tough subscale, the greatest DIF was found for the item indicating that athletes should “tough it out” regardless of long-term effects. Differences were noted between ice hockey participants and participants in basketball and swimming. Specifically, swimming participants reported significantly greater agreement with the statement than ice hockey participants (B=0.95), while ice hockey participants showed greater agreement than basketball participants (B=0.20). The extent of the difference between swimming participants and ice hockey participants was large, indicating a large magnitude of DIF for the item. This may again come down to a distinction between acute and chronic pain. Swimmers, in particular, often experience chronic pain due to overuse within their sport. Therefore, having a belief that one must “tough it out” is functional and allows the participant to continue participating despite the discomfort. Hockey athletes also often deal with chronic pain, from the wear and tear of the physical nature of the sport. Often, hockey injuries may start with acute injuries,

which turn into chronic pain by playing through them or by not allowing them to heal sufficiently before returning to participation in their sport.

DIF was also found for the item indicating that “athletes who endure pain and play hurt deserve our respect”. Participants involved in basketball were more likely to strongly endorse the item indicating that athletes should be respected for enduring pain in comparison to participants involved in swimming (B=-0.70). Yet, no differences were noted between ice hockey and basketball participants. The result of this item is surprising and contradictory to the previous item addressing the “tough it out”. It appears that basketball participants feel less of an expectation of having to endure pain, particularly the chronic type pain that swimmers endure, therefore when they do experience pain and play anyway, they feel that action deserves respect. Perhaps participating despite pain or injury is present within the culture of swimming, but it may not be linked with earning respect and is rather just something that everybody does.

Ice hockey participants were favored over swimming participants (B=-.52) for their endorsement of the item indicating “No pain, no gain”. This finding may be explained by the differences in the physical nature of the sports. Often the statement, “no pain, no gain” is referenced with an expectation of toughness and particularly sacrifice. The idea that ice hockey participants were favored over swimming participants for this item supports the culture of sacrifice observed within the sport of ice hockey.

DIF was found on the item indicating that “in sport, winning is everything”. Interestingly, DIF was found between swimming participants and both ice hockey and basketball participants. In both cases, swimming participants were favored in their responses over ice hockey and basketball participants (B=.53 and B=.59, respectively), indicating that based on their overall RPII Tough scores, participants involved in

swimming agreed more strongly that winning is everything. This result was unexpected as there is often a focus in many individual sports, such as swimming, on achieving one's personal best, regardless of overall outcome. It was expected that if a group was favored on this item, it would have been either ice hockey or basketball that are both team sports that often focus only on a win or loss outcome.

Most notable of the gender DIF findings for the RPII Tough items was also related to the item indicating "in sport, winning is everything". Female participants were favored for their endorsement of the statement over male participants (B=.32), although the strength of the difference was not as great as some of the other significant DIF findings. Much like the sport difference, this finding was also surprising as it was expected if a difference was found, males would have been favored in their response that winning is everything.

The second significant DIF finding based on gender for the RPII Tough items favored male participants for the item suggesting that athletes should "tough it out' regardless of long-term effects (B=-.18). The extent of the difference was rather small, but does suggest that male participants involved in sport reported a greater belief in the short-term gains, rather than being cognizant of potential longer term consequences of playing through pain. This is of concern to sports medicine personnel if athletes choose to play through pain without seeking help to help determine the extent of the injury and address long-term consequences.

DIF Results: SIP Total Coping Response Scale

Different Item Functioning was found on a number of items based on sport of participation. In particular, a number of items presented DIF in comparing swimming

participants and basketball participants. For example, DIF was found for three items related to ignoring pain and injury favoring basketball participants over swimming participants. The greatest DIF was found on the item “I see pain as a challenge and it doesn’t bother me”, with basketball participants more strongly endorsing the item than participants in swimming (B=-1.20). Basketball participants were also favored on the items indicating the use of mental games to keep their mind off the pain and when hurt (B=-.66), they just go on as if nothing happened (B=-.48). Together, these items suggest an increased use of avoidant-type coping strategies by basketball participants, which allows them to continue participation despite pain and injury. In contrast, swimming was favored over basketball on three items, as well. Participants involved in swimming were favored for the item suggesting more interest in returning to sport than stopping the pain over participants involved in basketball (B=1.09). Swimming participants were also favored for the item representing the use of prayer to stop the pain (B=.76) and for the item indicating that “when in pain, I often feel I can’t stand it anymore” (B=.63).

Participants in ice hockey were favored over basketball participants in their responses for two items including “when hurt, I tell myself it doesn’t hurt” (B=.24) and “when hurt, I tell myself to be tough and carry on” (B=.26). Both of these items suggest the use of denial-type coping strategies that allow ice hockey athletes to play through pain and injuries. The use of these types of coping strategies when it comes to pain and injury places athletes at greater risk of experiencing more serious injuries when they are unwilling to acknowledge initial signs or symptoms of pain and choose to play through the pain.

Swimming participants were favored over hockey participants in their responses to the item indicating that “pain is just part of the game”. Although injury statistics show

the incidence of acute injury is greater within ice hockey than swimming, there may be more chronic soreness and pain prevalent in a sport like swimming, where chronic and overuse injuries most often occur.

Summary

A number of significant differences were found, some consistent and some contradictory to previous research. Regardless, it appears that there are significant differences in the expectation of toughness related to the athletes' participation in sport and in the help-seeking tendencies for pains and injuries. Additional research is warranted to determine if similar differences are noted with different competitive levels of athletes and with athletes in different sports. The intent of this investigation was to address athletes' expectations of toughness that have been observed within the ice hockey culture and how those expectations influence help-seeking tendencies. The findings of this investigation suggest that although ice hockey athletes report a greater expectation of toughness compared to basketball and swimming athletes, their help-seeking tendencies did not differ. The presence of DIF was found for several items of the RPII Tough and SIP Total Coping Response. Although this was not the primary purpose of this investigation, it does provide additional support for research addressing gender and sport differences within the sport culture that may influence athletes' responses to pains and injuries. Further investigations using this type of analysis may help to identify particular nuances and differences present within diverse sport cultures. Although it may be beneficial to examine differences on overall constructs, using DIF analysis may help to identify key differences between sport cultures.

Strengths and Limitations

The current investigation had several strengths. First, the adequate sample size (N=222) allowed for a stable estimate within the SEM analysis. Although there is no absolute minimum sample size for SEM analyses, 200 is the generally accepted minimal sample size for moderately complex models (Kelloway, 1998). This investigation surpassed the minimal sample size examining the overall fit of the proposed models. The second strength of the investigation involved the participation of male and female participants representing three different sports. Many of the previous investigations addressing specific psychological components related to injury have focused on either male or female participants in one specific sport. Therefore, this investigation allowed for comparisons based on sport and gender, with comparable sample sizes representing each group.

From a practical standpoint, the present study shows that the sport ethic, specifically the expectation of toughness aspect, together with athletic identity and attitude toward pains and injuries play key roles in athletes' willingness to seek help for pains and injuries experienced during sport participation. When athletes take on the mentality that being tough is a necessary aspect of maintaining their identification as athletes and are willing to make the physical sacrifices in the name of sport, it places their health at increased risk. Instead of recognizing and acknowledging the initial signs and symptoms of an injury, many athletes attempt to, and many are successful, in playing through pain and injury. Gaining an understanding of the factors that influence athletes' willingness to acknowledge and seek help for injuries can help personnel responsible for the health care of athletes develop safe and non-threatening environments in which athletes seek help for their pains and injuries.

There are several limitations of this investigation. First, although the validity and reliability of the AIMS and COPE measures had been previously established, the same was not true for the RPII and SIP measures. Therefore, prior to beginning comparisons, it was critical to address the psychometric properties of the RPII and SIP measures. Although the statistics validated their use in this investigation, further content validity testing of the measures is warranted. A second limitation in this investigation was the use of only NCAA Division III athletes participating in the sports of ice hockey, basketball, and swimming. The generalization of the results to all Division III athletes, other sports, or to NCAA Division I or Division II athletes is not advised. A third limitation is that with the investigation based on self-report responses, participants may have been susceptible to a response bias and socially desirable reporting. Participants were advised that all responses would remain confidential. Although the principal investigator did have prior professional relationships with some of the participants, it accounted for less than five percent of the participants, helping to assure anonymity of responses.

Future Directions and Practical Implications

Based on the results of this investigation, additional research investigations verifying the validity and reliability of the RPII and SIP measures are warranted. Overall, the measures used in this investigation showed strong construct validity and reliability during pilot testing and during this investigation, thus supporting their use. However, additional development of measures that focus on the key constructs of the sport ethic is warranted.

Additional research should be performed to further explain the role of the sport ethic in help-seeking tendencies for pains and injuries. This investigation has shown that

increased belief in the expectation of toughness leads to lower levels of overall help-seeking for the pains and injuries experienced in sport. Making the distinction between discomforts that can be safely played through versus those that may worsen with continued participation can be difficult for athletes to distinguish.

Future research addressing attitude toward pain and injury and help-seeking tendencies for pain and injury should make a distinction between acute and chronic pain and injury. Without making the distinction, it is difficult to differentiate between the two, and the attitude and help-seeking tendencies may differ between the two. For example, pain and injuries that become chronic in nature are often manageable at the onset, yet it is often not until the symptoms worsen that athletes seek help. However, the signs and symptoms of acute injuries, such as sprains, strains, and fractures, are often easier to recognize, although they may also be ignored or denied.

The expectation of toughness within sport was found to play a significant role in athletes' help-seeking tendencies for pains and injuries in this investigation involving ice hockey, basketball, and swimming athletes. Additional research addressing the expectation of toughness and other components of the sport ethic should be performed with additional sports, particularly those where "toughness" and masculinity are seen most positively, such as football and wrestling.

Although certain trends were found within this investigation, additional investigations should address the influence of these factors in help-seeking at other levels of participation. It is possible athletes who receive money to play, either by scholarship or by participating in sport as professionals, may identify more strongly with their roles as athletes and also may report increased expectations of toughness and sacrifice that comes along with the pay check. Hughes and Coakley (1991) offered that

athletes who see sport as an exclusive mobility route may be more likely to overconform to the sport ethic. Athletes who are performing at the more elite levels of sport with the dream of making it to the next level or staying at the top level may take the idea of dedication and sacrifice to the extreme in hopes of “making it”.

Additional research should be performed to address other personal and situational factors that may influence athletes’ help-seeking tendencies. One social-situational factor to investigate is the relationship and rapport that athletes have with their primary health care providers, often athletic trainers in the college setting. From a practical standpoint, it appears that these interactions can play key roles in athletes’ willingness to report pains and injuries. When athletic trainers have a strong rapport and relationship built on mutual trust and respect, it is likely that athletes will be more likely to report their issues, despite the presence of other factors that may work against them reporting them. Along with the relationship and rapport with primary health care providers is the availability and readiness of these personnel to provide help. Swimming is considered a low-injury risk sport and therefore often receives the least sports medicine coverage. With limited exposure to sports medicine personnel, it is likely participants in swimming will seek help elsewhere. Ice hockey, with its high injury risk, often receives the best coverage, along with football, due to the potentially catastrophic nature of the sport. With this regular contact and direct coverage, it is likely ice hockey athletes are more willing to seek assistance from those they see around regularly.

One personal factor of interest in its influence on help-seeking tendencies is self-esteem. Hughes and Coakley (1991) suggested that athletes who have low self-esteem are more likely to overconform to the sport ethic. It is likely that as athletes have greater levels of self-esteem, they place less emphasis on outside pressures and instead are

able to make their own decisions. Therefore, research linking self-esteem with the aspects of the sport ethic and athletic identity may provide a clearer picture of the influences on help-seeking tendencies.

Overall, it appears athletes' beliefs in the sport ethic and ensuing attitude toward pain and injury as something to be ignored or endured negatively influence their willingness to seek help for the pains and injuries experienced during sport. This is of concern in that as athletes choose to deny or ignore that pain and injuries are present, they further risk their health and risk possible permanent disability. Athletes may not immediately recognize the severity and potential long-term consequences of playing through pain. Therefore, it is important for athletes to seek assistance in making the distinction between playing with pain without risk of further injury, and an injury that calls for attention.

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APPENDIX A

CONSENT TO ACT AS A HUMAN PARTICIPANT

ID#: _____

THE UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
CONSENT TO ACT AS A HUMAN PARTICIPANT: LONG FORM

Project Title: An investigation to examine the influence of athletic identity, sport ethic, and attitude toward pain and injury on help-seeking tendencies following athletic injury.

Project Director: Stephanie Stadden, Doctoral Graduate Student, Exercise and Sport Science Department

Participant's Name: _____

DESCRIPTION AND EXPLANATION OF PROCEDURES:
This investigation is examining the influence of athletic identity, the sport ethic, and attitude toward pain and injury on help-seeking tendencies following athletic injury. Participants will be asked to complete a self-report questionnaire addressing athletic identity, the sport ethic, attitude toward pain and injury, and help-seeking tendencies following athletic injury. Participants for this investigation will be recruited from two Midwestern institutions participating in Division III athletics. It is estimated the instrument will take approximately 30 minutes to complete.

RISKS AND DISCOMFORTS:
There are no physical risks from participation in this investigation. Although injury is a common occurrence from sport participation, athletes differ in how they physically, psychologically, and emotionally respond to injuries. While there is a low likelihood that participants will become upset or experience psychological or emotional distress while completing this questionnaire, it is a possible result as participants are asked to recall and respond to questions related to experiences with pain and injury from sport participation. Participants who become upset or experience psychological or emotional distress should advise the questionnaire administrator as such, and contact information for campus psychosocial support resources, such as the Student Counseling Center, will be made available. Also, participation in this investigation is completely voluntary and consent may withdrawn at any time without penalty or consequence.

POTENTIAL BENEFITS:
Participation in this study will not directly benefit the participant and no individual results on the measurements completed for this investigation will be provided to participation. The indirect benefits of this research investigation include increased knowledge about the social factors that may affect an athlete's willingness or unwillingness to seek help for pain or injury. Following the completion of the investigation, a written report (abstract) of findings will be provided to the head athletic trainers at the involved institutions who are responsible for overseeing the health care of the participants. This increased knowledge may allow professionals working with student-athletes to better appreciate why athletes may fail to seek help for pain and injury and take active steps to encourage help-seeking behaviors.

CONSENT:
By signing this consent form, you agree that you understand the procedures and any risks and benefits involved in this research. You are free to refuse to participate or to withdraw your consent to participate in this research at any time without penalty or prejudice; your participation is entirely voluntary. Your privacy will be protected because you will not be identified by name as a participant in this project. All data collected for this investigation will be kept in a locked room within the Sport & Exercise Psychology lab (247HHP). All data will be kept for three years. After two years, all collected written data will be shredded and disposed of.
The University of North Carolina at Greensboro Institutional Review Board, which insures that research involving people follows federal regulations, has approved the research and this consent form. A copy of this Informed Consent form will be provided to all participants. Questions regarding your rights as a participant in this project can be answered by calling Mr. Eric Allen at (336) 256-1482. Questions regarding the research itself will be answered by the principal investigator, Stephanie Stadden by calling 336-334-4504. Any new information that develops during the project will be provided to you if the information might affect your willingness to continue participation in the project.

By signing this form, you are indicating that they are 18 or older and you are agreeing to participate in the investigation described to you by Stephanie Stadden.

_____ _____

Participant's Signature Date

APPENDIX B

PARTICIPANT INFORMATION

ID#: _____

Participant Information

Institution/University Attending _____

Sex _____ Male _____ Female

Age _____ Race/Ethnicity _____

Current Sport of Participation
_____ Basketball
_____ Diving
_____ Ice Hockey
_____ Swimming

Year of Athletic Eligibility
_____ Freshman
_____ Sophomore
_____ Junior
_____ Senior
_____ 5th Year Senior

Did you participate in single sex or co-ed sport as a youth?
_____ Single sex only _____ Co-ed _____ Both, single sex and co-ed

If you participated in co-ed sport as a youth, how many years (seasons) did you participate in co-ed? _____

How would you describe your current playing status?
_____ Starter
_____ Often play in games/participate in competitions
_____ Sometimes play in games/participate in competitions
_____ Rarely play in games/participate in competitions

Have you ever experienced pain or injury resulting from your participation in sport that required you to **miss at least one month** of participation in your sport?
_____Yes _____ No

How long has your **most severe** athletic injury kept you from participation in your sport?
_____ < 2 weeks
_____ 2 weeks to 1 month
_____ 1 month to 3 months
_____ 3 months to 6 months
_____ > 6 months

Have you experienced pain or injury during your participation in sport for which you **DID NOT** immediately seek assistance? (i.e., You played with it or attempted to "walk it off".)

_____ Yes _____ No

If yes, why did you not report the injury immediately?

_____

_____

On a scale of 1 to 5 with 5 being the worst pain you have ever felt in your entire life (or can imagine feeling), how bad does the pain have to get before you seek help for pains and injuries?
(*Please circle one number only.)*

Pain Free	1	2	3	4	5	Worst Pain

On a scale of 1 to 5, how likely are you to play through pain and injury in your sport?

Never	1	2	3	4	5	Always

APPENDIX C

ATHLETIC IDENTITY MEASUREMENT SCALE (AIMS)

Please respond to each of the following items by circling the appropriate response. Try to respond to each item separately in your mind from other items. Choose answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU – not what you think "most people" would say or do. Please clearly circle ONE response per statement.

Response Scale:

SA = Strongly Agree
A = Agree
N = Neutral
D = Disagree
SD = Strongly Disagree

	Strongly Agree				Strongly Disagree
1. I consider myself an athlete.	SA	A	N	D	SD
2. I have many goals related to sport.	SA	A	N	D	SD
3. Most of my friends are athletes.	SA	A	N	D	SD
4. Sport is the most important part of my life.	SA	A	N	D	SD
5. I spend more time thinking about sport than anything else.	SA	A	N	D	SD
6. I need to participate in sport to feel good about myself.	SA	A	N	D	SD
7. Other people see me mainly as an athlete.	SA	A	N	D	SD
8. I feel bad about myself when I do poorly in sport.	SA	A	N	D	SD
9. Sport is the only important thing in my life.	SA	A	N	D	SD
10. I would be very depressed if I were injured and could not compete in sport.	SA	A	N	D	SD

APPENDIX D

RISK, PAIN, AND INJURY ITEMS QUESTIONNIARE (RPII)

Please respond to each of the following items by circling the appropriate response. Try to respond to each item separately in your mind from other items. Choose answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU – not what you think "most people" would say or do. Please clearly circle ONE response per statement.

Response Scale:

SA = Strongly Agree
A = Agree
D = Disagree
SD = Strongly Disagree

	Strongly Agree			Strongly Disagree
1. Athletes who complain about pain and injuries ought to be worried about losing their position on the team.	SA	A	D	SD
2. No pain, no gain.	SA	A	D	SD
3. Athletes who endure pain and play hurt deserve our respect.	SA	A	D	SD
4. Any athlete can be replaced.	SA	A	D	SD
5. Athletes should try to recover quickly from injuries.	SA	A	D	SD
6. Coaches make athletes feel guilty if they don't want to play hurt or with pain.	SA	A	D	SD
7. Serious athletes have to play with injuries and pain.	SA	A	D	SD
8. Athletes who say they can't play because they are hurt usually are telling the truth.	SA	A	D	SD
9. Athletes who care about their team will try to play with injuries and pain.	SA	A	D	SD
10. Athletes should "tough it out" with an injury or pain today and not worry about the effects tomorrow.	SA	A	D	SD
11. Coaches only care about their players who are healthy and able to play.	SA	A	D	SD
12. Every athlete should expect to have to play with an injury or pain sometime.	SA	A	D	SD
13. Coaches say they don't want athletes to play with serious injuries, but they usually actually push them to play if needed.	SA	A	D	SD
14. Athletes should ignore pain.	SA	A	D	SD
15. Athletes ignore injured teammates.	SA	A	D	SD
16. Coaches are impressed with athletes who play with injuries and pain.	SA	A	D	SD

	Strongly Agree			Strongly Disagree
17. Team athletic trainers and doctors care more about the needs of the team than about the needs and feelings of the athletes they are treating .	SA	A	D	SD
18. Fans lose interest in athletes who are injured and out of action.	SA	A	D	SD
19. Only athletes understand what it is like to play with injuries and pain.	SA	A	D	SD
20. Being an athlete means that you have to be willing to accept risks.	SA	A	D	SD
21. Coaches and other athletic officials do everything possible to protect athletes from injuries.	SA	A	D	SD
22. You can't worry about injuries and pain if you are going to be an athlete.	SA	A	D	SD
23. Injured athletes should trust team doctors and athletic trainers.	SA	A	D	SD
24. Athletes trying to comeback following injury have something to prove.	SA	A	D	SD
25. Playing with injuries and pain demonstrates character and courage.	SA	A	D	SD
26. Athletes will do everything possible to play despite injuries and pain.	SA	A	D	SD
27. Athletes should never complain.	SA	A	D	SD.
28. In sport, winning is everything and losing is nothing.	SA	A	D	SD
29. Athletes need to push themselves to their physical limits.	SA	A	D	SD
30. It is very difficult for athletes to quit, even after serious injuries.	SA	A	D	SD
31. Athletes who get injured can only blame themselves.	SA	A	D	SD

APPENDIX E

SPORTS INVENTORY FOR PAIN (SIP)

Below is a list of statements that describe the way athletes often feel about discomfort and its influence on performance. Please read each statement and circle the letters associated with the response that best describes your feelings at this time. There are no right or wrong answers.

Please use the following response scale:

SA = Strongly Agree
A = Agree
N = Neutral
D = Disagree
SD = Strongly Disagree

	Strongly Agree				Strongly Disagree
1. I see pain as a challenge and I don't let it bother me.	SA	A	N	D	SD
2. I owe it to myself and those around me to perform even when my pain is bad.	SA	A	N	D	SD
3. When in pain, I tell myself it doesn't hurt.	SA	A	N	D	SD
4. When injured, I pray for the pain to stop.	SA	A	N	D	SD
5. If I feel pain during a game, it's probably a sign that I'm doing damage to my body.	SA	A	N	D	SD
6. I have little or no trouble with my muscles twitching.	SA	A	N	D	SD
7. At this point, I am more interested in returning to my sport than in trying to stop the pain.	SA	A	N	D	SD
8. When in pain, I imagine that the pain is outside my body.	SA	A	N	D	SD
9. When injured, I feel that it's never going to get better.	SA	A	N	D	SD
10. When injured, I could perform as well as ever if my pain would go away.	SA	A	N	D	SD
11. I do not worry about being injured.	SA	A	N	D	SD
12. Pain is just a part of the game.	SA	A	N	D	SD
13. When hurt, I play mental games with myself to keep my mind off the pain.	SA	A	N	D	SD
14. When hurt, I worry all the time about whether it will end.	SA	A	N	D	SD
15. When in pain, I have to be careful not to make it worse.	SA	A	N	D	SD
16. I seldom or never have dizzy spells or headaches.	SA	A	N	D	SD
17. When I am hurt, I just go on as if nothing happened.	SA	A	N	D	SD
18. When in pain, I mentally replay great past performances.	SA	A	N	D	SD
19. If in pain, I often feel I can't stand it anymore.	SA	A	N	D	SD

	Strongly Agree				Strongly Disagree
20. The worst thing that could happen to me is to injure/reinjure myself.	SA	A	N	D	SD
21. I seldom notice minor injuries.	SA	A	N	D	SD
22. When injured, I tell myself to be tough and carry on.	SA	A	N	D	SD
23. When hurt, I do anything to get my mind off the pain.	SA	A	N	D	SD
24. When hurt, I tell myself I can't let the pain stand in the way of what I want to do.	SA	A	N	D	SD
25. No matter how bad any pain gets, I can handle it.	SA	A	N	D	SD

APPENDIX F

COPE INVENTORY

This questionnaire asks you to indicate what you generally do and feel when you experience stressful events, such as experiencing an athletic or exercise-related injury. Obviously, different events bring out somewhat different responses, but think about what you usually do (or would do) when you experience an athletic or exercise-related injury.

Indicate what YOU usually do when YOU experience a stressful event, such as experiencing an ATHLETIC INJURY. Please indicate only one response for each statement.

Please use the following response scale:

1 = I usually don't do this at all
2 = I usually do this a little bit
3 = I usually do this a medium amount
4 = I usually do this a lot

	Not at all			A lot
1. I try to grow as a person as a result of the experience.	1	2	3	4
2. I turn to work or other substitute activities to take my mind off things.	1	2	3	4
3. I get upset and let my emotions out.	1	2	3	4
4. I try to get advice from someone about what to do.	1	2	3	4
5. I concentrate my efforts on doing something about it.	1	2	3	4
6. I say to myself "this isn't real."	1	2	3	4
7. I put my trust in God.	1	2	3	4
8. I laugh about the situation.	1	2	3	4
9. I admit to myself that I can't deal with it, and quit trying.	1	2	3	4
10. I restrain myself from doing anything too quickly.	1	2	3	4
11. I discuss my feelings with someone.	1	2	3	4
12. I use alcohol or drugs to make myself feel better.	1	2	3	4
13. I get used to the idea that it happened.	1	2	3	4
14. I talk to someone to find out more about the situation.	1	2	3	4
15. I keep myself from getting distracted by other thoughts or activities.	1	2	3	4
16. I daydream about things other than this.	1	2	3	4
17. I get upset, and am really aware of it.	1	2	3	4
18. I seek God's help.	1	2	3	4
19. I make a plan of action.	1	2	3	4
20. I make jokes about it.	1	2	3	4
21. I accept that this has happened and that it can't be changed.	1	2	3	4
22. I hold off doing anything about it until the situation permits.	1	2	3	4
23. I try to get emotional support from someone.	1	2	3	4
24. I just give up trying to reach my goal.	1	2	3	4
25. I take additional action to try to get rid of my problem.	1	2	3	4

	Not at all			A lot
26. I try to lose myself for a while by drinking alcohol or taking drugs.	1	2	3	4
27. I refuse to believe that it has happened.	1	2	3	4
28. I let my feelings out.	1	2	3	4
29. I try to see it in a different light to make it seem more positive.	1	2	3	4
30. I talk to someone about something concrete to do about the problem.	1	2	3	4
31. I sleep more than usual.	1	2	3	4
32. I try to come up with a strategy about what to do.	1	2	3	4
33. I focus on dealing with this problem, and if necessary let other things slide a little.	1	2	3	4
34. I get sympathy and understanding from someone.	1	2	3	4
35. I drink alcohol or take drugs, in order to think about it less.	1	2	3	4
36. I kid around about it.	1	2	3	4
37. I give up the attempt to get what I want.	1	2	3	4
38. I look for something good in what is happening.	1	2	3	4
39. I think about how I might best handle the problem.	1	2	3	4
40. I pretend that it hasn't really happened.	1	2	3	4
41. I make sure not to make matters worse by acting too soon.	1	2	3	4
42. I try hard to prevent other things from interfering with my efforts at dealing with this.	1	2	3	4
43. I go to movies or watch TV, to think about it less.	1	2	3	4
44. I accept the reality of the fact that it happened.	1	2	3	4
45. I ask people who have had similar experiences what they did.	1	2	3	4
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.	1	2	3	4
47. I take direct action to get around the problem.	1	2	3	4
48. I try to find comfort in my religion.	1	2	3	4
49. I force myself to wait for the right time to do something.	1	2	3	4
50. I make fun of the situation.	1	2	3	4
51. I reduce the amount of effort I'm putting into solving the problem.	1	2	3	4
52. I talk to someone about how I feel.	1	2	3	4
53. I use alcohol or drugs to help me get through it.	1	2	3	4
54. I learn to live with it.	1	2	3	4
55. I put aside other activities in order to concentrate on this.	1	2	3	4
56. I think hard about what steps to take.	1	2	3	4
57. I act as though it hasn't even happened.	1	2	3	4
58. I do what has to be done, one step at a time.	1	2	3	4
59. I learn something from the experience.	1	2	3	4
60. I pray more than usual.	1	2	3	4

Indicate what YOU usually do when YOU experience a stressful event, such as experiencing an ATHLETIC INJURY. Please complete each statement with the indicated person(s) (a. coaches, b. teammates, c. athletic trainers) and indicate your response for each person(s).

		Not at all			A lot
61.	I try to get advice from _____ about what to do.				
	a. my coach	1	2	3	4
	b. my teammates	1	2	3	4
	c. my athletic trainer(s)	1	2	3	4
62.	I discuss my feelings with _____.				
	a. my coach.	1	2	3	4
	b. my teammates.	1	2	3	4
	c. my athletic trainer(s).	1	2	3	4
63.	I talk to _____ to find out more about the situation.				
	a. my coach	1	2	3	4
	b. my teammates	1	2	3	4
	c. my athletic trainer(s)	1	2	3	4
64.	I try to get emotional support from _____.				
	a. my coach.	1	2	3	4
	b. my teammates.	1	2	3	4
	c. my athletic trainer(s).	1	2	3	4
65.	I talk to _____ about something concrete to do about the problem.				
	a. my coach	1	2	3	4
	b. my teammates	1	2	3	4
	c. my athletic trainer(s)	1	2	3	4
66.	I get sympathy and understanding from _____.				
	a. my coach.	1	2	3	4
	b. my teammates.	1	2	3	4
	c. my athletic trainer(s).	1	2	3	4
67.	I ask _____ who has had or dealt with similar experiences what they did.				
	a. my coach	1	2	3	4
	b. my teammates	1	2	3	4
	c. my athletic trainer(s)	1	2	3	4
68.	I talk to _____ about how I feel.				
	a. my coach.	1	2	3	4
	b. my teammates.	1	2	3	4
	c. my athletic trainer(s).	1	2	3	4

THANK YOU FOR YOUR PARTICIPATION.