

Competing While Injured: What Wrestlers Do and Why

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## **Dedication**

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## Abstract

The normalization of risk culture within sport injury has created an environment where athletes train and compete while injured despite the known health risks (Nixon, 1992, 1996; Wiese-Bjornstal, 2010). Athlete beliefs about their capacity to perform while in pain and pressure from social network sources are factors thought to influence their risk taking behaviors related to training and competing while injured. The purpose of this study was to examine this risk subculture characterized by pain beliefs, risk behaviors, and social network influences in the context of a demanding, high injury risk sport. Intercollegiate wrestlers ( $N = 195$ ) at fifteen National Collegiate Athletic Association (NCAA) Division I universities participated by completing a paper and pencil survey, which consisted of a demographics questionnaire, the Sports Inventory for Pain (SIP), the Risk Behavior Conformity in Sport Injury Questionnaire (RBCSI), and the Sport Network Pressure and Support Questionnaire. Results of a multiple regression analysis examining the ability of beliefs to predict deceit behaviors among those wrestlers with prior injuries showed a significant model ( $p = .03$ , Adjusted R square = .043), with the SIP Coping subscale score a significant predictor of the RBCSI Deceit Behaviors ( $\beta = -.30$ ,  $p = .001$ ). Employing direct pain coping thought processes such as ignoring pain and toughing it out were directly related to the undesirable behaviors of deceiving others about one's health status. A second multiple regression analysis also showed a significant model ( $p = .003$ , Adjusted R square = .074) in which two belief measures were significant predictors of RBCSI Impression Management Behaviors, SIP Coping ( $\beta = -.20$ ,  $p = .022$ ) and SIP Catastrophizing ( $\beta = -.23$ ,  $p = .01$ ). Direct pain coping thought

processes (such as ignoring pain and toughing it out) and catastrophizing thoughts (such as dwelling on pain and giving up when in pain), were directly related to the undesirable actions associated with maintaining a tough façade. With respect to analyses concerning behaviors and injury components, frequency of injury was moderately correlated ( $r = .42$ ,  $p < .05$ ) with RBCSI Healthy Behaviors, with high frequencies of injury associated with the more likely use of healthy behavior strategies. Social network influences descriptive analyses showed that coaches (69.5%) and teammates (63.5%) were reported to “always” or “sometimes” pressure wrestlers to compete while injured. Wrestlers felt pressured to compete while injured “always” or “sometimes” 20.8% of the time by their athletic trainers and 10.9% of the time by their physicians. Implications of these results are discussed as they relate to the beliefs and behaviors of athletes, influences of their social network sources, and ties to injury components.

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## CHAPTER ONE

### Introduction

A significant number of athletes are willing to compete while injured despite the known risks (Nixon, 1993a, 1996; Wiese-Bjornstal, 2010). These athletes embrace the sport ethic, which emphasizes sacrifice in order to compete in sport. This risk taking mentality puts athletes in a vulnerable position by encouraging deviant behavior such as taking prescription pain medication to play through the pain or hiding signs of injury to avoid being thought of as weak or soft (Hughes & Coakley 1991; Nixon, 1993a, 1994b; Roderick, 1998; Roderick, Waddington & Parker, 2000; Safai, 2003; Theberge, 2008; Wiese-Bjornstal, 2010). The normalization of pain and injury within sport creates an environment where athletes develop a belief system in which they are willing to subject themselves to continually managing threats to their health during injury (Curry & Strauss, 1994; Murphy & Waddington, 2007; Nixon, 1993a, 1994a, 1996; Safai, 2003; Theberge, 2008; Wiese-Bjornstal, 2010). While there are a number of factors that increase the likelihood that an athlete will compete while injured, the strong influence of the social network in which an athlete plays on the decision making process to compete with injury is one of the most predominant (Anderson, 2007; Curry & Strauss, 1994; Mitten, 1993; Murphy & Waddington, 2007; Nixon, 1993a, 1993b, 1994a, 1994b; Polsky, 1998; Roderick, 1998; Roderick et al., 2000; Safai, 2003). The more an athlete embraces the sport ethic the greater the impact their beliefs about pain and injury, risk conformity behaviors and social network influences play into the decision to compete while injured.

According to Curry and Strauss (1994), normalizing sport injury is a process of defining injuries in sport as routine and uneventful. Normalization of risk culture in sport is tied to the normative ethos in sport, where expectations are to be tough and play through injury (Roderick et al., 2000; Theberge, 2008; Wiese-Bjornstal, 2010). Based on this normative culture, psychological and sociocultural processes create a reality whereby athletes ignore pain and injury to obtain performance success (Wiese-Bjornstal, 2010). Thus, there appears to be a set of accepted beliefs and behaviors that exist with many athletes in terms of pain and injury.

Relationships among social groups specific to sport create a subculture defined by Nixon as the sportsnet (Nixon, 1993a, 1993b, 1994b). A sportsnet encompasses the athlete's injury support team from whom they might seek support, guidance, understanding, reassurance and treatment to help them deal with the pain and injuries they may face (Nixon, 1994b; Roderick, 1998; Roderick et al., 2000). For intercollegiate athletes, the sportsnet members may include coaches, teammates, athletic trainers and physicians. Concern exists that members of one's sportsnet may be biased and likely to encourage the culture of risk rather than prioritizing the health and welfare of the athlete (Curry & Strauss, 1994; Nixon, 1993a, 1994a, 1994b; Roderick, 1998; Roderick et al., 2000; Safai, 2003).

Sports participation provides athletes with both the opportunity to engage in health promoting behaviors and the opportunity to engage in potentially health damaging behaviors. While athletes are striving to win, the frequency at which risky and potentially damaging behaviors occur may increase as injured athletes are willing to

sacrifice their bodies for the opportunity to win. In fact, members of an athlete's social network may encourage these potentially harmful behaviors in the name of victory.

There are athletes who have battled through injury repeatedly and have pushed themselves to the limit. This complex interplay about how social and psychological factors work together to influence an athlete to compete while injured is worthy of further examination because of the potential negative health consequences of these decisions.

Therefore, the purpose of this study was to examine the subculture surrounding elite level wrestling as evidenced by a) the pain beliefs, b) risk behavior conformity, c) social network sources, and d) components of injury. To accomplish this, the following research questions were asked:

1. Does a wrestler's self-reported capacity to perform while in pain predict risk behavior conformity in sport injury?
2. What relationships are there between specific components of injury and use of healthy, deceit, or impression management behaviors?
3. To what extent do male intercollegiate wrestlers use various social network sources when deciding whether to complete while injured?
4. What relationships are there between specific components of injury and frequency of pressure from social network sources?

This study provides insight into the control, or lack of control, an athlete has when determining whether to compete while injured. Implications of the information gathered might be that athletes may realize the impact that members of their social network have on their decision. Additional implications may be that social network sources may

realize the power and responsibility they have when helping an athlete make the decision to compete or not compete through injury.

While the results of this study should relate to a large group of athletes as well as athletes' social network sources, there are limitations and delimitations inherent in the methods of this investigation. The participants include National Collegiate Athletic Association (NCAA) Division I male wrestlers, which restricts study participants to a specific age group, gender, sport and level of competition. By restricting participants to these inclusionary criteria the general expectancy is that these athletes will have experienced similar issues related to competing while injured at this point in their athletic careers. Thus, while athletes at all levels likely experience to some extent, the pressure to compete while injured, in order to demonstrate significance differences and control for competing explanations only a restrictive sample of elite athletes was studied. In addition, another limitation is that overlaps of influence may exist between social support groups in the decision-making process and ability of participants to isolate the specific influences of one group over another due to self-report and reflection.

## **CHAPTER TWO**

### **Review of Literature**

In this review, literature grounding an understanding of the beliefs, behaviors and culture of sport injury is examined. Drawing from sources in sport psychology, sport sociology, philosophy and ethics, and sports medicine, a case is made for why studies examining the health consequences of embracing a subculture of pain and injury endurance are needed.

#### **Athlete Beliefs and Behaviors Related to Pain and Injury**

There has been a great deal of research in the last few decades on the relationships between sport participation and health. According to Theberge (2008), there are two main topics within the psychological aspects of sport injury literature that have been examined: normalization of pain and injury and the social groups linked to pain and injury. These topics were specifically examined in terms of the athlete's response to the risk associated with sport and injury (Theberge, 2008). In order to better understand the development of the risk-pain-injury phenomenon one must examine the history of sport literature. At the beginning of the 20<sup>th</sup> century, an emphasis placed on athletes and competition was the development of moral character and a focus on gentlemanly behavior (Theberge, 2008). Contemporary sport, on the other hand, emphasizes maximizing performance. No longer is gentlemanly behavior preferred, but rather the idea of winning at all costs has developed into a primary motivation in competitive sporting events. The ethos created by the strong desire to win increases the likelihood of rationalization and normalization of the risks of injury seen today (Curry & Strauss,

1994; Roderick, 1998). However, this culture of contemporary sport did not always exist, and the current financial rewards or stakes have not always been the driving force behind the athletes' decisions to playing through pain (Murphy & Waddington, 2007; Roderick, 1998). The contemporary social standard is that elite performance and success matter above all else, a belief now firmly entrenched in sport.

**Normalization.** While athletes normalize injuries, understanding the degree to which an athlete may manage or attempt to reduce the threat injury poses to their health provides insight into the athletes understanding of pain and health risk (Theberge, 2008). The normalization of risk culture in sport is closely tied to the normative ethos of sport, the expectation that athletes should be tough and play through the pain or injury (Hughes & Coakley, 1991; Nixon, 1993a, 1993b, 1994b; Roderick 1998; Roderick et al., 2000; Safai, 2003; Theberge, 2008, Wiese-Bjornstal, 2010). Based on the sport culture, psychological and sociocultural factors facilitate a process by which athletes ignore pain and injury to obtain success (i.e., doing whatever it takes to win; Nixon, 1992, 1996; Roderick, 1998, Wiese-Bjornstal, 2010). There are athletes who strongly believe the risk associated with injury is explained by the saying, "...it's just the normal bad part of what I do" to rationalize the constant battle they face with minor and major injuries (Theberge, 2008, p. 212). Athletes may simply disregard pain and injury in an effort to earn success despite indications that based on their present situation, their ability to perform well and achieve their goals of success might be reduced (Roderick, 1998). The commonly held view among athletes is that there is not one player who competes that is 100% healthy all the time because pain and injury are part of the game (Roderick et al., 2000).

Athletes may discredit and disregard the realities of pain, risk and injury based on this idea of normalization, until it becomes second nature to do so (Theberge, 2008). Athletes may feel they know what to do or not to do, say or not to say, without really thinking about the risks involved, because they are so deeply immersed in the sport culture (Hughes & Coakley, 1991; Roderick, 1998).

Many athletes see some of the imbalances in sport as an opportunity to test themselves, seeing how mentally strong and technically sound they have become. These athletes may believe that they have never been more physically fit even though it is not healthy to train by repeating the same motion over and over for three or more hours per day (Theberge, 2008). Other athletes believe that their sport has made them tough, or more psychologically prepared. They believe their sport has affected their mental state in a unique way that is irreplaceable even though there may be a price to pay or a cost to their physical well-being (Theberge, 2008). For instance, one of the athletes in Theberge's (2008) study stated, "well, if you can endure this then you can endure pretty much anything. I don't think there's anything out there that I'm afraid of after putting myself through this kind of strain" (p. 217). Athletes often embrace the sport ethos and normalization of injury and avoid focusing on the risk they are taking when competing while injured.

**Sport ethic.** Human behavior involves choices based on meanings that people give to a situation as they interact with one another (Coakley, 1998). Each person develops a sense of who they are and how they relate to society through their behavior and seeing the impact of their behavior on themselves and others. Athletes' behavior is

dictated by the four core sport ethic beliefs. Athletes who ascribe to the “sport ethic” demonstrate an unqualified acceptance and unquestioning commitment to a set of social norms that have become the criteria for what it means to be a real athlete (Hughes & Coakley, 1991).

The first factor of the sport ethic is being an athlete involves making sacrifices for the game. This factor focuses on sole commitment to an athlete’s sport and that all other interests must be seen as of lesser importance. For instance, athletes who compete while injured demonstrate their commitment to the sport along with coaches and teammates (Hughes & Coakley, 1991; Malcom, 2006).

The second factor of the sport ethic is that being an athlete involves striving for distinction. Athletes must constantly improve on their abilities and improvement comes through hard work represented by enduring and welcoming pain (Malcom, 2006). Only winning represents true improvement. Thus, real athletes according to the sport ethic seek to break records, push the limits and dominate within their sport.

The third factor of the sport ethic is that being an athlete involves risks and playing through pain. The premise is that athletes never break down from pressure and challenge themselves despite possible physical risk. However, athletes immersed in the sport ethic may or may not be conscious of the risks they are taking by competing while injured. For instance one of the athletes interviewed by Theberge (2008) stated, “but it’s a risk I was aware of and it’s a risk I’m comfortable taking and I would be comfortable taking again simply because I think the pros completely outweigh the cons in this situation” (p. 212). In contrast, there are times when athletes have only a vague

understanding of the risk they may be taking by continuing to push through injury (Murphy & Waddington, 2007; Safai, 2003). Athletes may be conscious of health issues concerning their sport but may not be fully aware of the immediate risks or the long-term consequences associated with competing while injured. According to Wiese-Bjornstal (2010), however, “the extent, severity, and lifespan health consequences of orthopedic damage, brain injury, and physiological excess exact an often heavy price for adherence” to the normalization of sport and risk (p. 109).

The fourth factor of the sport ethic is that being an athlete involves refusing to accept limits in the pursuit of possibilities. Therefore if an athlete lives according to the sport ethic, then anything is possible. Yet in the pursuit of obtaining their ultimate goals of winning and sport success, athletes may fully accept risking their health to achieve such success (Hughes & Coakley, 1991; Roderick, 1998).

Curry’s 1992 report of a young wrestler exemplifies the normalization of pain and injury through embracing the sport ethic (as cited in Coakley, 1998). As the wrestler went through his career, he shook off minor injuries, expressed desire and motivation practicing and competing while injured, avoiding using pain or injury as an excuse not to participate, used healthcare professionals as individuals who could help him get through completion while injured, and was committed to the premise “that all athletes must pay a price as they strive for excellence” (Coakley, 1998, p. 53). All four beliefs of the sport ethic influenced the behavior of the wrestler. However, he also showed how health damaging behaviors can be glorified within the world of sport and defining of an athlete.

## **Injury**

While physical activity and sport are closely linked, there is a large disparity between the two in regard to perceptions of health and injury. In the context of competitive sport, athletes frequently compete with pain and injury often putting their health in further jeopardy in order to perform (Roderick et al., 2000; Theberge, 2008). Not surprisingly, Waddington (2004) suggests that true health benefits associated with sport and physical activity are greater from regular and moderate activity rather than competitive, contact sport. Typically, when exploring the topic of sport injury, investigators consider injury occurred during training (practice, weight lifting, conditioning) or competing (games, matches, tournaments, etc.) within a sport but time was also lost from practice, training or competition due to such injury (Wiese-Bjornstal, 2010). It is likely that another injury category, full participation with injury, should be created. This category accommodates injury not involving a loss of time from sport. While this form of injury is concrete and real, it exists partially due to the social pressure exerted onto athletes that expects and encourages them to push through injury by persevering with training and competing in the presence of injury.

According to the Sport Injury Risk Profile (Wiese-Bjornstal, 2010), there are a factors associated with sport injury that are both intrinsic and extrinsic in nature. For example, intrinsic factors have biological and psychological characteristics that lead to actions of the athlete. Extrinsic factors include an athlete's physical and sociocultural characteristics along with events associated with the sport environment. Both intrinsic

and extrinsic factors have implications for an athlete's behavior and may increase vulnerability to risk based on exposures, choices and hazards created (Wiese-Bjornstal, 2010). Male, contact sport collegiate athletes (e.g., wrestlers) are among those who are most willing to engage in higher levels of risk behavior (Wiese-Bjornstal, 2009).

Injury is a frequent consequence of elite level sports participation. According to the NCAA Injury Surveillance Systems Report, for a team of 50 athletes there is 1 injury for every 2 competitions and 1 injury for every 5 practices (Hootman, Dick & Agel, 2007). Among the sports examined over a 16 year period, the top five sports with the highest game injury rates were men's football, men's wrestling, men's soccer, women's soccer and men's ice hockey. Game injury rates for men's wrestling were 26.4 injuries per 1000 Athlete-Exposures. The five sports with the highest practice injury rates were men's spring football, women's gymnastics, men's wrestling, women's soccer, and men's soccer. Practice injury rates for men's wrestling were 5.7 injuries per 1000 Athlete-Exposures. Within wrestling, the sport of focus in the present study, the highest injury rate within practice and match competition were found in Division I as compared to Division II and III (Hootman et al., 2007). These high rates may be influenced by the nature of wrestling as a combat sport (Curry & Strauss, 1994; Hootman et al., 2007). Given the high rates of sport injury for intercollegiate athletes and, specifically for that of male intercollegiate wrestlers, there is a need to identify factors that influence risk behaviors associated with injury.

## **Social Influence**

Based on the factors presented, a central question must be asked: does participation and a willingness to accept risks in sport, specifically the risk of competing while injured, involve primarily voluntary behavior or is the behavior coerced via social pressures? In Roderick's (1998) article, a commentary on the work of Howard L. Nixon II, he stated that athletic participation occurs within a social context in which athletes may feel either pressure or support from the significant others that encourage embracing the pain and risk associated with sport injuries. Therefore, both behaviors used when competing while injured and the influence of social network sources may be dictated by the degree the athlete and sportsnet embrace the sport ethic.

The social network theory focuses on relationships among social groups and on the patterns and implications of these relationships (Roderick, 1998). Specific to athletes is Nixon's concept of the sportsnet. This concept draws from social network theory as it focuses on the patterns and structures of interactions between athletes and members of the athletic subculture in sport. The existence of this subculture, known as the sportsnet, is significant in the analysis of risk, pain and injury because it emphasizes how sharing in the culture of risk extends beyond just the athlete (Nixon, 1992; Roderick, 1998; Safai, 2003). Nixon stated that athletes are likely to look for support to deal with pain and injury from those who have either been in similar circumstances or those who have a firsthand understanding of the conflict they face as athletes. Examples are coaches, teammates and athletic trainers (1992, 1993, 1994a, 1994b; Roderick, 1998). The term sportsnet as used in this study encompasses an athlete's injury support team. This

support team includes coaches, teammates, athletic trainer and physician. Physicians were added to this study based on the involvement a physician has with an athlete and the management of their sports injury participation. Athletic trainers and physicians are the two healthcare professionals most involved in the care of injured athletes.

The sportsnet is an important resource group from whom athletes might seek support such as guidance, understanding, reassurance, and treatment to help them deal with (1) the pain and injuries they experience and (2) with the decision to continue to compete or not compete while injured (Nixon, 1993a, 1993b, 1994a, 1994b). If support from the sportsnet is adequate, athletes should gain a sense of increased control and a feeling that they are making acceptable decisions to compete with their pain and injury (Nixon, 1994b). Not all athletes are willing to talk about these issues with figures of authority who may threaten their opportunity to compete. If an athlete does not find appropriate support to help them balance the demands of sport and health, and therefore decides to compete while injured, they may increase their risk for pain, further injury, and long-term health problems.

Nixon believes that based on the makeup of the sportsnet, athletes are exposed to a biased social support group that may try to influence them to normalize the pain and injury and compete (Nixon, 1993a, 1993b, 1994b; Roderick et al., 2000). Thus, as a result of the interaction of the members of the sportsnet, they can convey a message to embrace the culture of risk rather than a message that favors promoting the athlete's health (Nixon 1994b; Roderick, 1998). Types of sportsnets that are considered more detrimental to athletes by fostering a culture of risk include a large, dense, centralized,

closed, undifferentiated, stable group that has authoritative power within sport and can easily access the injured athlete (Nixon 1993a, Roderick et al. 2000). Norbert Elias, a sociologist known for his development of Figural Sociology, describes social structures as nothing more than constraints exerted by people over one another and themselves (as cited in Roderick, 1998). His idea stresses the interdependence of social relationships and how they inflict pressure and power over one another. In the case of the sportsnet, athletes appear to be a population that is under continuous pressure to yield to the culture of risk, which encourages sport participation in the presence of pain and injury.

As athletes reach the elite levels of sport, they have been influenced by rules, beliefs, attitudes and patterns of behavior that are learned formally and informally throughout youth. However, the people who have the most influence throughout a person's athletic career change throughout their athletic experience. This dynamic group continually changes from an athlete's introduction to sport through the many years before the athlete achieves elite status. An athlete's sportsnet evolves as people who were extremely influential throughout youth based on a high amount of contact (e.g., parents) may find their role reduced or entirely replaced by other network relationships. Over time people who specialize within the sport may find other sportsnet members increasing their power of influence (e.g., coaches; Roderick, 1998). Many of these athletes gradually find themselves in relationships with sports specialists who are in some way connected to their sports performance. The development of these relationships is often part of the evolution from a young, talented, physically active individual to achieving the

status of an elite level athlete. In fact, the network of relationships athletes find themselves in may be much larger than they realize. Thus, the closely woven actions of numerous individuals connected to the athlete or to one another can unintentionally influence the athlete's decisions (Roderick, 1998).

The social network sources an athlete identifies with may vary throughout their entire athletic career including parents, strength and conditioning coaches, exercise physiologists, personal trainers, nutritionists, and sports psychologists. Specific to an athlete's intercollegiate career, the social network sources thought to be most influential are coaches, teammates, athletic trainers, and physicians.

**Coaches.** Coaches are the “central figures in the athletic subcultures and social networks of athletes, and as central figures, they may influence athletes' choices about taking risks with their bodies and playing with pain and injuries” (Nixon, 1994a, p. 80). When coaches are presented with evidence of pain and injury, they use the culture of risk to justify their sport (Nixon, 1993b). Coaches may reference an athlete's ability to build character or learn to deal with obstacles by dealing with injury. Those athletes who are not prepared to play through pain and injury may be stigmatized as not having the “right attitude” (Roderick et al., 2000).

A qualitative investigation identified reasons why young wrestlers would risk permanent injury to maintain sport involvement (Shaffer, 1996). Each wrestler was to describe his coach's reaction to his worst injury as a reference to how the reaction of a significant other influenced the athlete's interpretation of the injury. The Shaffer study demonstrated that 59% of participants felt that the “coach's reaction to injury,” was a

negative reaction. The coach's negative reaction to injury "...illustrated the athlete's perception of coach's displeasure with the injury occurrence," through either the negative affective response or pressure to return (Schaffer, 1996, p.85). At the high school level, it was evident to a majority of wrestlers that their coaches had a negative response to injury and felt pressure from their coaches to return to wrestling.

According to Nixon's (1994a) study on NCAA Division I coaches' views on risk and injury, coaches indicated strong agreement or agreement with reservations in two thirds of the risk culture items presented. Based on the significance shown supporting the culture of risk and the "sport ethic," coaches may be enforcing the normalization of injury for athletes (Nixon, 1994a). According to Nixon's (1994b) study on social pressure, social support, and help seeking for pain and injuries in college sport networks, 49.7% of athletes surveyed felt pressure from coaches to play hurt and 51.3% said they were not discouraged by coaches to play hurt. Those participating in Nixon's (1994b) study were male and female NCAA Division 1 athletes who were characterized by sport type (team versus individual). Results revealed that coaches pressuring athletes to play hurt are more likely to push athletes to discuss the pain and injury they are experiencing (Nixon, 1994b). There is evidence that the majority of coaches say they care for the health of athletes, yet they encourage and expect athletes to take risks to compete (Nixon, 1994a; Roderick, 1998). Coaches' focus on the culture of risk associated with sport to motivate athletes based on the structure of risk associated with their sport (Nixon, 1993b). For example, wrestling is by nature a combat sport that requires athletes to forcefully take down an opponent to score points. In this process of scoring points, an

athlete may have to put their own body at risk to gain positional advantage, which could result in injury. The very nature of wrestling by putting one's body at risk allows coaches to have a direct influence through instruction of technique that may increase risk behavior as part of the sport culture.

**Teammates.** Teammates share directly in the day-to-day experiences of an athlete. They relate on multiple levels that include, but are not limited to age, activities, travel, victories, struggles, and largely the sport ethos. Teammates also are peers who provide social evaluation and social comparison. Based on the sport ethos, teammates are immersed within the same culture of risk identity (Hughes & Coakley, 1991). Teammates have a bond specific to that group of athletes as they have an understanding of what other athletes on the team go through in terms of their sport experience (Hughes & Coakley, 1991). Only teammates know what other teammates go through which reinforces the idea that only they know what it is really like to be an athlete on their team.

Results from a study done on female, adolescent gymnasts revealed teammates were influential in encouraging each other to train and complete through pain and injury (Nippert, 2005). According to the responses, 69% of gymnasts would continue or would expect their teammates to continue sport participation when injured. This acceptance of the sport ethic was embraced by teammates who competed through injury for the good of the team. The majority of gymnasts (81%) were comfortable talking with their teammates about pain and injury over other members of the sportsnet, which allowed for the culture of risk and sport ethic to be reinforced by advice given from teammate to teammate.

According to Nixon's (1994b) study on social pressure, social support, and help seeking for pain and injuries in college sports networks with male and female NCAA Division 1 athletes, 41% of athletes felt pressure to compete with an injury from teammates and 55.1% of athletes said they were not discouraged from competing with injury by their teammates. Athletes are more likely to talk to teammates if they are individual sport athletes versus team sport athletes (Nixon, 1994b). Therefore, given these findings, evidence is provided to suggest that teammates play a significant role in influencing injured athletes to continue to play despite injury.

**Athletic trainers.** The management of risk and injury in elite athletes has created medical environments that can be simultaneously places of "medical mastery and extraordinary neglect" (Roderick et al., 2000, p.167). As athletes continue to compete and wear down their bodies in order to achieve success within sport, there is a need for specialized healthcare professionals (Safai, 2003). Athletic trainers are closely involved in the treatment of injured athletes on a regular basis. Based on access and proximity, athletic trainers are a natural social support provider for the injured athlete (Yang, Peek-Asa, Lowe, Heiden, & Foster, 2010). The athletic trainer serves as a liaison between the injured athlete and the physician. Athletes may learn to trust their athletic trainer and physician to make medical decisions for them (Nixon 1993a; Roderick, 1998). A danger is that the medical support team in caring for the athletes may be more immersed in the sport ethic and concerned with winning than in the welfare of the athlete (Safai, 2003).

The athletic trainer tends to be the first healthcare practitioner that an athlete sees when injured as they are the individual onsite at each practice, lift, conditioning session,

and competition. The job of an athletic trainer involves the prevention, diagnosis, treatment, and rehabilitation of medical conditions, which includes emergency, acute and chronic medical conditions (National Athletic Trainers Association, 2012). All athletic trainers work under the guidance of a physician no matter the setting in which they work.

While there are official protocols for athletic trainers to follow in caring for different injuries; those protocols may not prepare athletic trainers to deal with the circumstances that arise secondary to the injury (Safai, 2003). Timing is a factor that is consistently brought up in terms of motivation to compete while injured. The pain tolerance of a particular athlete may increase parallel to the degree of acceptance of the culture of risk allowing the athlete to be functional and compete (Safai, 2003). There are some injuries that do not allow for any leeway regarding return to play such as concussions in which the athlete is not in a position to negotiate. Other injuries may allow athletes to feel fully functional even though healthcare professional know complete healing has not taken place. Given the differences in protocols based on type of injury, there is reason to believe that this freedom of choice may lead athletic trainers to pay more attention to serious injuries and less attention to minor injuries, therefore, increasingly the likelihood that athletes will play or feel some type of pressure to play when injuries are minor.

**Physicians.** When evaluating doctor-patient relationships it can be established that it is common for bargaining between doctor and patient over treatment and excused responsibilities, such as work or other social responsibilities (Roderick et al., 2000). If the physician has fully informed the athlete of all possible risks associated with early

return from injury, the physician may then feel that he or she relinquished responsibility to the athlete. Sometimes despite a physician's specific recommendation against participation, the athlete wishes or chooses to participate anyway (Mitten, 2009). In this case, an athlete may have to sign a waiver relinquishing responsibility from the physician as well as the healthcare institution. However, athletes may also feel that information was withheld, either negligently or intentionally, from them about the nature of their injury and possible risks associated with their injury. Based on the withholding of this information, the athlete may feel that he or she was prevented from making a fully informed decision about the timing of return to competition (Mitten, 1993; Roderick et al., 2000). The physician should ensure that the athlete understands the potential risk he or she is taking by competing with injury. Information covering diagnosis, treatment, alternatives, possibility of re-injury or subsequent injury, and severity should all be discussed by the physician and athlete in regard to the short and long-term consequences of premature return to play (Mitten, 1993).

To not be influenced by the social network members, a physician must remain independent. The physician's role is to protect the health of athletes and look out for their best interests rather than the best interests of the team, coach, administrators, or others (Curry & Strauss, 1994; Mitten, 1993). A physician may feel pressure from the athletes themselves, or from their employer (i.e., the institution who in part pays for the services rendered by athletes) to compromise their medical ethics (Mitten, 1993; Polsky, 1998). The American College of Sports Medicine (ACSM) addresses this issue by saying that when approached with pressure from coaches, parents or other outside sources, the

physician has a duty to treat the athlete and should ignore pressure from other members of the sportsnet (Polsky, 1998). However, the ACSM does not share specific recommendations on how to go about doing this. Therefore, there is a concern that coaches, teammates, or athletic trainers may apply social pressure, by leaning on the physician, to encourage athletes to play while injured.

In addition, an athlete may return to sport more quickly than recommended when the athlete accepts the risk of returning earlier than the physician proposed. Failure to follow physician recommendations with injury treatment can be considered contributory negligence (Mitten, 1993). A larger question is whether the athlete may have been coerced to return or was this decision may freely (Anderson, 2007).

In sum, this review illustrates the complex nature of factors influencing athletes' decisions to play with pain and injury. Examining how these social and psychological components of influence interact and relate to actual injury markers could illustrate the specific health endangering – or health enhancing – beliefs and behaviors of athletes deciding whether and when to play with pain and injury.

## CHAPTER THREE

### Method

A single administration survey method was chosen for the purpose of learning from the wrestling population about their injury experiences in respect to pain beliefs, risk behavior conformity, components of injury, and social network sources. The advantages of using a survey included low cost, rapid turn around, and a broad base of subjects geographically such that the results could be generalized. This quantitative method of data collection allowed for anonymity, which was essential in order for participants to feel comfortable and answer honestly about how they feel concerning their experiences.

### Participants

NCAA Division I intercollegiate male wrestlers were chosen because of the high rate of injury (26.4 per 1000 Athlete-Exposures in games and 5.7 per 1000 Athlete-Exposures in practice) associated with wrestling (Hootman et al., 2007). Of interest to this investigation, wrestlers at this level of participation would experience the pressures associated with elite level of competition in NCAA Division I athletics. Criteria for inclusion to the study stated that wrestlers must be listed on the university's roster to show that they are currently part of the team. By retrieving data during the summer and early fall, wrestlers listed on their roster would have all experienced at least one year of intercollegiate wrestling. Of the wrestlers present at each data collection, all wrestlers chose to participate. Currently, there are no females who participate in NCAA Division I wrestling, which limits participants to male only. The total number of participants in the

present study was 195 male, intercollegiate wrestlers from 15 different NCAA Division I wrestling programs. Wrestlers participating in this study were between the ages of 18 and 25 ( $M = 20.28$  years,  $SD = 1.34$ ) and they self-reported having participated in intercollegiate wrestling an average of 2.18 years ( $SD = 1.21$ ). See Appendix H for frequency tables on participant demographics.

Competing in the 2011-2012 NCAA wrestling season, there were 77 wrestling programs in the country indicating approximately 20% of NCAA Division I wrestling programs participated in this study. Six out of the ten NCAA Division I wrestling conferences had representation including the ACC, Big Ten, CAA, EIWA, EWL, and MAC. Nine out of the 15 programs (60%) that participated in the study finished in the top 25 at the 2012 NCAA Division I wrestling championships.

### **Measures**

The measures chosen for this study were based on evaluating the key components of beliefs associated with competing while injured, behaviors associated with competing while injured, and social network sources influencing injury decisions for intercollegiate wrestlers. Measures related to beliefs associated with competing while injured were chosen based on previous use in publications related to an athlete's capacity to perform while in pain following injury. A measure specific to athlete's behaviors associated with competing while injured was identified as in the developmental stages and a new version of such was employed for this study. Measures concerning an athlete's social network varied in terms of the individuals included in the network and their roles. Thus, a new

measure was created for the purpose of this study. All measures were completed in a paper and pen format.

**Demographics Questionnaire.** A short questionnaire was created to ask participants about their eligibility, age and experience with injury. Eligibility describes the number of years that the athlete competed at the NCAA Division I level, including a redshirt year. The wrestlers distinguish their experiences with intercollegiate wrestling injury in terms of the number of injuries experienced, the number of surgeries experienced, and time loss associated with the most severe injury experienced. The wrestlers' injury experience represented the opportunities to compete with injury and their interactions with their sportsnet during that time. Refer to Appendix A for complete demographics questionnaire.

**Sports Inventory for Pain (SIP).** The Sports Inventory for Pain was developed as a sport-specific measure of an athlete's capacity to perform with pain (Meyers, Bourgeois, Stewart, & LeUnes, 1992; see Appendix B). There were 25 items that comprise the five subscales associated with the SIP. The first subscale was Coping (items 1, 2, 7, 12, 17, 22, 24, 25), which described the direct coping responses of athletes. The second subscale was Cognitive (items 3, 8, 13, 18, 23), which analyzed the use of cognitive strategies. Third, Avoidance (items 5, 10, 15, 20) explained the avoidance of pain-producing actions. The fourth subscale looked at the tendency to be overwhelmed by pain, titled Catastrophizing (items 4, 9, 14, 19). The final subscale was Body Awareness (items 6, 11, 16, 21) described as response style, meaning the extent to which an individual is hyper or hyposensitive to physiologically produced sensory stimuli. A

composite score, called HURT, was calculated to represent an overall index of ability to perform athletically while in pain. To obtain the HURT composite score, the negative scales were subtracted from the positive scales ( $HURT = COP + COG - CAT - AVD$ ). Internal consistency reliabilities were shown by Cronbach's coefficient alpha levels to be .88 to .61 for the SIP subscales (Meyers et al., 1992). Test-retest reliability coefficients were found to be from .69 to .88 (Meyers et al., 1992). Validity was determined from ANOVA and subsequent post hoc analyses that looked at relationships between groups on each subscale and then combined (Meyers et al., 1992). Please refer to Appendix B for complete Sports Inventory for Pain.

**Risk Behavior Conformity in Sport Injury (RBCSI) Questionnaire.** As part of a larger study (Kenow & Wiese-Bjornstal, 2010) examining the role of the sport ethic in intercollegiate sports injury, a new injury questionnaire evaluating the behavioral dimensions of the construct was developed. In order to measure self-reported behaviors that reflect the degree of conformity to both risky and healthy actions surrounding sports injury, a 17-item survey, the Risk Behavior Conformity in Sport Injury (RBCSI) questionnaire was developed. Items for the questionnaire were derived from published research in sport sociology and sport psychology examining the ways in which athletes behave in response to pain and injury in sport (Hughes & Coakley, 1991; Nippert, 2005; Pike & Maguire, 2003; Safai, 2003; Young, White & McTeer, 1994). The initial questionnaire items were reviewed and critiqued by six professionals with experience in sport psychology, sport sociology, exercise physiology, and sports medicine to determine if the items were worded clearly, and if the individual items had face validity as measures

of common athlete behaviors in response to sport injury. Athletes from a variety of sports who completed the questionnaire were asked to respond about how frequently they engaged in a specific behavior on a 5-point Likert scale ranging from *never* (1) to *always* (5). The results of a principal components factor analysis with varimax rotation resulted in a five-factor solution: actions due to concern about consequences, actions due to feeling pressure from others, actions counter to medical advice, positive/healthy actions, and use of medications and drugs (Kenow and Wiese-Bjornstal, 2011).

Based on results from the first version of the RBCSI questionnaire (Kenow & Wiese-Bjornstal, 2011), a revised version was created by significantly restructuring existing items and inserting new behavior items as derived from the literature. Two athletic trainers and two researchers in sports medicine psychology collaborated in revising items on the questionnaire. Two small samples of athletic training and kinesiology undergraduate majors completed the revised inventory and suggested further revisions. The finalized questionnaire used by athletes in the present study was a 45-item inventory consisting of five hypothesized factors with nine items each. Modifications were also made to the overall general instructions for completing the questionnaire to make it specific to the NCAA wrestling population. The instructions asked athletes the following: “Think about your own intercollegiate wrestling injury experiences. Circle one response for each item indicating whether or not the described actions are like things you have actually done during your own intercollegiate wrestling injury incidents”. Wrestlers in the present study completed the revised RBCSI questionnaire as described. Please refer to Appendix C to view the RBCSI Questionnaire.

**Sport Network Pressure and Support Questionnaire.** This instrument was created specifically for this study to determine the extent to which athletes interact with social network sources when deciding to compete with injury. The content of this questionnaire was based on a portion of the Nixon (1994a, 1994b) questionnaire that focused on social relationships and social support. Nixon studied not only the social relationships and support but also the issues of gender and race, which were omitted for the purpose of this study. The topics of gender (not relevant to NCAA wrestling) and race are not related to the purpose of this study. Nixon examined them in the context of social status.

The influence of the social network sources was determined by asking the wrestlers, “Do you consult your coaches, teammates, athletic trainer, or team physician when deciding whether to compete while injured?” Pressure from social network sources was evaluated by asking the wrestlers, “Do you feel pressured by your coaches, teammates, athletic trainer or team physician when deciding whether to compete while injured?” Wrestlers were asked a parallel set of questions in reference to advisement against competing while injured. Responses to these questions were individually scaled as “always”, “sometimes” and “never”. All participants had access to athletic trainers and physicians, which were part of their institution’s sports medicine team. The Sport Network Pressure and Support Questionnaire can be reviewed in Appendix D.

### **Procedure**

Once Institutional Review Board (IRB) approval was received the study commenced. A list of NCAA Division I wrestling programs was accessed online from

the 2011 NCAA Division I wrestling championships final team standings, which listed all teams who had one or more wrestlers participate. Athletic trainers and/or coaches working directly with the wrestling team at their individual NCAA institutions were contacted via phone call and/or email to discuss their willingness to facilitate participation with the study as well as to identify the means to seek approval for data collection most expediently at their institution. Once institutional approval was obtained and willingness to participate was established, dates of intended campus visit were discussed and solidified with athletic trainers and/or coaches. Consent forms and questionnaires were distributed and collected by the principal investigator in each respective institution's wrestling room, or an alternate room agreed upon by coach/athletic trainer and principal investigator. During presentation of questionnaires, the purpose of the study was explained to athletes with a prewritten description to ensure all participants were equally informed. Participation in the survey was completely voluntary. Athletes were given time to ask any questions about their participation in the study. Clarification about their responsibilities or the potential risks and benefits of participation were also addressed. All athletes present at these meetings agreed to participate in the study and returned their consent form (see Appendix E) prior to receiving the survey. Surveys were placed in a separate envelope than those of the consent forms upon athlete completion. Each meeting lasted 20 to 40 minutes.

### **Statistical Analyses**

Once data was returned, the revised RBCSI questionnaire was further reduced from this 45-item version via a principal components factor analysis with varimax

rotation conducted by Kenow and Wiese-Bjornstal (2011) as part of the scale development project. While it is outside of the scope of this masters' thesis to present in great detail the factor analysis results, it is important to state results. As the final factors and associated items were scored for use in the remaining analyses of the present study. Results of the factor analysis identified a three factor solution, each with seven items. These factors were labeled Deceit Behaviors (items 6, 31, 36, 37, 38, 41, 42), Impression Management Behaviors (items 16, 20, 21, 22, 27, 32, 35), and Healthy Behaviors (items 4, 9, 14, 19, 24, 29, 44) subscales. Deceit Behaviors are those in which athletes are hiding injuries or treatment needs through their actions. Impression Management Behaviors are those in which athletes are demonstrating to others their toughness and commitment by doing whatever it takes to compete. Healthy Behaviors are those in which athletes comply with and embrace health promoting actions and strategies associated with injury. All three subscales showed good reliability (Cronbach's alpha reliability for Deceit Behaviors = .85, Impression Management Behaviors = .86, and Healthy Behaviors = .88). These 21 items, and the associated three subscales, resulted in the RBCSI scores used in the remainder of the statistical analyses in the present study.

Data analysis was completed using SPSS version 19.0 (SPSS, Inc., 2010). Frequency tables were created showing descriptive statistics of participants for the specific components of injury (frequency of injury, frequency of surgery, and severity of worst injury measured via time loss). Multiple regressions were conducted to determine if the five SIP subscales could predict three RBCSI subscales. The relationships (correlations) between the two frequency components of injury and each of the three

RBCSI subscales were investigated using Pearson product-moment correlation coefficients. The differences between RBCSI subscales based on severity of worst injury were examined with three separate ANOVAs. Tables were created to demonstrate the frequency of consultation and pressure from social network sources. The relationships between each of the specific components of injury and frequency of pressure from social network sources were also explored using Pearson product-moment correlation coefficients.

## CHAPTER FOUR

### Results

There were four major research questions asked in order to examine the subculture surrounding elite level wrestling as evidenced by the pain beliefs, risk behavior conformity, components of injury, and social network sources. Each of these four major research questions was broken down into three more specific questions in order to address the structure of the SIP, RBCSI, components of injury, and social network sources. A variety of statistical analyses were employed to answer these questions based on the data gathered.

#### **Question 1: Does a male intercollegiate wrestler's self-reported capacity to perform while in pain predict risk behavior conformity in sport injury?**

One of the central questions of this investigation was to ask whether the cognitions and beliefs of athletes predict their actual behaviors in sport injury situations. In order to answer this question, separate multiple regression analyses were conducted using the five subscale scores of the SIP (as a measure of an intercollegiate wrestler's beliefs about their self-reported capacity to perform while in pain) to predict each of the three subscale scores on the RBCSI (as a measure of risk behavior conformity) with those wrestlers who reported having been injured during their intercollegiate wrestling career. The five subscales of the SIP are Coping, Cognitive, Catastrophizing, Avoidance and Body Awareness, as shown in Table 1. The three subscales of the RBCSI are Healthy Behaviors, Deceit Behaviors, and Impression Management, as shown in Table 2. Thus, three separate linear regressions were conducted, one for each RBCSI dimension.

Table 1

*Descriptives for SIP Subscales*

	SIPCOPING	SIPCOG	SIPCAT	SIPAVD	SIPBA
<b>Mean</b>	30.24	15.71	10.42	12.86	13.30
<b>Std. Deviation</b>	4.06	2.81	2.68	2.39	2.58

Table 2

*Descriptives for RBCSI Subscales*

	RBSCIHealthy	RBSCIDeceit	RBSCIImpression
<b>Mean</b>	16.48	13.08	16.11
<b>Std. Deviation</b>	3.72	3.93	4.28

**Question 1a: Do the pain beliefs of intercollegiate wrestlers who have been injured during their career predict their use of healthy injury behaviors?**

Multiple regression via the SPSS enter method was used to assess the ability of pain beliefs, in terms of the five SIP subscales (Coping, Cognitive, Catastrophizing, Avoidance, and Body Awareness) to predict the use of Healthy Behaviors (RBCSI Healthy scale) of wrestlers who reported being injured at least once during their intercollegiate wrestling careers ( $n = 171$ ). The overall regression model was not significant ( $F_{5,165} = 1.263, p = .282, \text{Adjusted R square} = .008$ ). None of the five SIP subscales explained the variance in use of Healthy Behaviors at a statistically significant level. See Appendix I for regression output tables for Healthy Behaviors.

**Question 1b: Do the pain beliefs of intercollegiate wrestlers who have been injured during their career predict their use of deceitful injury behaviors?**

Multiple regression via the SPSS enter method was used to assess the ability of

pain beliefs, in terms of the five SIP subscales to predict the use of Deceit Behaviors (RBCSI Deceit scale), of wrestlers who reported being injured during their intercollegiate wrestling careers. A significant model emerged ( $F_{5,165} = 2.54, p = .03$ , Adjusted R square = .043), with the SIP Coping subscale score the only significant predictor of the RBCSI Deceit Behaviors ( $\beta = -.30, p = .001$ ). Employing direct pain coping thought processes (such as ignoring pain and toughing it out) were directly related to the undesirable behaviors of deceiving others about one's health status. See Appendix J for regression output tables for Deceit Behaviors.

**Question 1c: Do the pain beliefs of intercollegiate wrestlers who have been injured during their career predict their use of impression management injury behaviors?**

Multiple regression via the SPSS enter method was used to assess the ability of pain beliefs, in terms of the five SIP subscales to predict the use of Impression Management Behaviors (RBCSI Impression scale) of wrestlers who reported being injured during their intercollegiate wrestling careers. A significant model emerged ( $F_{(5,165)} = 3.72, p = .003$ , Adjusted R square = .074) in which two belief measures were significant predictors of RBCSI Impression Management Behaviors, SIP Coping ( $\beta = -.20, p = .022$ ) and SIP Catastrophizing ( $\beta = -.23, p = .01$ ). Direct pain coping feelings (such as ignoring pain and toughing it out) and catastrophizing thoughts (such as dwelling on pain and giving up when in pain), were related to undesirable actions associated with demonstrating to others one's toughness and commitment by doing whatever it takes to compete. See Appendix K for regression output tables for

Impression Management Behaviors.

**Questions 2: What relationships are there between specific components of injury experiences and use of healthy, deceit, or impression management behaviors?**

This question was asked in order to determine if and what type of relationship exists between injury experiences and an athlete's response to injury in terms of their actual behaviors. Pearson product-moment correlations were run to show a relationship or lack thereof between each of the components of injury (frequency of injury, frequency of surgery, and severity of worst injury measured via time loss; see Appendix H for demographics tables) and the three subscale scores on the RBCSI, measuring their risk behavior conformity. This information will be highlighted below.

**Question 2a: Is there a relationship between frequency of injury and healthy, deceit, or impression management behaviors?**

The relationships between frequency of injury (as measured by item b of the RBCSI, with a continuous range of 0 to 10 injuries,  $M = 3.03$ ,  $SD = 2.50$ ) and use of Healthy, Deceit, and Impression Behaviors were investigated using Pearson product-moment correlation coefficients. Table 3 shows the frequency of injury based on number of injuries experienced by participants during their intercollegiate wrestling careers. There was a moderate, positive correlation between injury frequency and RBCSI Healthy Behaviors,  $r = .42$ ,  $r^2 = .17$ ,  $p < .01$ , 95% CI [.29, .53] with high frequencies of injury associated with the more likely use of healthy behavior strategies. Frequency of injury helps explain 17 percent of the variance in the more likely use of healthy behavior

strategies. No significant relationships were found between frequency of injury and behaviors associated with Deceit or Impression Management.

Table 3

*Frequency of Injury (Item b of RBCSI)*

<b>Injuries</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
<b>Frequency</b>	26	29	46	28	14	17	14	4	5	0	8

**Question 2b: Is there a relationship between surgery frequency and healthy, deceit, or impression management behaviors?**

The relationships between frequency of surgery (as measured by item 4 of the demographics questionnaire, with a continuous range of 0 to 3 surgeries,  $M = .45$ ,  $SD = .75$ ) and use of Healthy, Deceit and Impression Management Behaviors were investigated using Pearson product moment correlation coefficients. Table 4 shows the frequency of surgery based on number of surgeries experienced by participants during their intercollegiate wrestling career. There was a weak but significant, positive relationship between frequency of surgery and use of RBSCI Healthy Behaviors,  $r = .23$ ,  $r^2 = .33$ ,  $p < .01$ , 95% CI [.09, .36] with high frequencies of surgery associated with the more likely use of Healthy Behaviors. Frequency of surgery helps to explain 33 percent of the variance in the more likely use of healthy behaviors. No significant relationship was seen between frequency of surgery and behaviors associated with either Deceit or Impression Management.

Table 4

*Frequency of Surgery (Item 4 of Demographics)*

<b>Surgeries</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Frequency</b>	131	46	12	6

**Question 2c: Are there differences between healthy, deceit, or impression behaviors based on severity of worst injury (based on time loss)?**

Based on the categorical nature of the independent variable of severity of worst injury (as measured by item 5 of the demographics questionnaire), three separate one-way ANOVAs, one for each RBSCI dependent variable, were used to answer this question. In reference to participants' worst injury, the amount of time loss where participant was unable to participate in regular practice and/or competition was responded to within seven categorical choices as shown in Table 5 (Never been injured/Does not apply; Never missed time for an injury; 1 to 3 days; 1 week; 1 month; 3 months; 6 months or longer). Significance was measured at a  $p < .05$  level.

Table 5

*Severity of Worst Injury via Amount of Time Loss (Item 5 of Demographics)*

<b>Category</b>	<b>Never Injured</b>	<b>Never Missed Time</b>	<b>1-3 days</b>	<b>1 week</b>	<b>1 month</b>	<b>3 months</b>	<b>6 months or longer</b>
<b>Frequency</b>	20	5	26	29	49	30	36

The first one-way between groups analysis of variance (ANOVA) was conducted to explore the differences in Healthy Behaviors, as measured by the RBCSI based on severity of worst injury. There was a statistically significant difference at the  $p < .05$

level in RBCSI Healthy scores for the seven time loss categories:  $F_{(6, 188)} = 36.7, p < .001$ . Along with reaching statistical significance, the actual difference in mean scores between groups was of medium effect. The effect size, calculated using eta squared, was .54. Post-hoc comparisons using the Tukey HSD test indicated that the mean scores for the never been injured group and the never missed time group were significantly different from all other injury groups. The mean Healthy score for those who had been injured 1 to 3 days ( $M = 14.08, SD = 3.53$ ) was significantly lower than those who had been injured 1 month ( $M = 17.16, SD = 2.77$ ), 3 months ( $M = 17.13, SD = 2.93$ ), and 6 months or longer ( $M = 18.39, SD = 2.49$ ). The mean score of those for whom their worst injury indicated time loss of 1 week ( $M = 15.34, SD = 4.23$ ) was significantly lower than only those who had been injured for 6 months or longer ( $M = 18.39, SD = 2.49$ ).

A second ANOVA was conducted to explore differences in Deceit Behaviors (measured by the RBCSI) as a function of severity of worst injury. The same categories were used in reference to the amount of time loss as with those compared to Healthy Behaviors. There was a statistically significant difference at the  $p < .05$  level in RBCSI Deceit scores for the seven time loss categories:  $F_{(6, 188)} = 6.02, p < .001$ . Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated by eta squared, was .16. Post-hoc comparisons using the Tukey HSD test indicated that the mean Deceit score for those who had never been injured ( $M = 8.90, SD = 7.71$ ) was significantly lower than those who had been injured for 1 to 3 days ( $M = 13.50, SD = 3.81$ ), 1 week ( $M = 13.83, SD = 3.75$ ), 1 month ( $M = 12.86, SD = 3.63$ ) and 6 months or longer ( $M = 14.03, SD = 3.59$ ).

Comparisons showed that the mean Deceit score for those that had never missed time ( $M = 6.00, SD = 6.82$ ) was significantly lower than those who had been injured 1 to 3 days ( $M = 13.50, SD = 3.82$ ), 1 week ( $M = 13.83, SD = 3.75$ ), 1 month ( $M = 12.86, SD = 3.63$ ), and 6 months or longer ( $M = 14.03, SD = 3.59$ ).

A third ANOVA was conducted to identify differences in Impression Management Behaviors based on severity of worst injury. The same categories were used in reference to time lost from participation as were used to compare to Healthy and Deceit Behaviors. There was a statistically significant difference at the  $p < .05$  level in RBCSI Impression scores for the seven time loss categories:  $F_{(6, 188)} = 6.44, p < .001$ . Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated by eta squared, was .17. Post-hoc comparisons using the Tukey HSD test indicated that the mean Impression score for those who had never been injured ( $M = 10.75, SD = 9.35$ ) was significantly lower than those who had been injured for 1 to 3 days ( $M = 17.42, SD = 3.82$ ), 1 week ( $M = 15.55, SD = 4.79$ ), 1 month ( $M = 16.33, SD = 3.72$ ), 3 months ( $M = 15.17, SD = 4.28$ ) and 6 months or longer ( $M = 16.17, SD = 4.13$ ). Post-hoc comparisons indicated that the mean Impression Management score for those who had never missed time ( $M = 6.80, SD = 8.32$ ) was significantly lower than all other injured groups. There were no significant differences between any of the groups who had lost time with one another.

**Question 3: To what extent do male intercollegiate wrestlers use various social network sources when deciding whether to compete while injured?**

A vital research question was to examine the extent at which male intercollegiate wrestlers interact with those who may influence their decision to compete while injured. Frequency of consultation and pressure by the social network sources were analyzed using descriptive statistics and frequency tables. The four social network sources are coaches, teammates, athletic trainers, and physicians.

**Question 3a: To what extent are various social network sources consulted by male, intercollegiate wrestlers when deciding whether to compete while injured?**

Identified by the Sport Network Pressure and Support Questionnaire, intercollegiate wrestlers reported when deciding whether to compete while injured, the two social network sources most frequently consulted were coaches and athletic trainers; whether referring to if wrestlers “always” consulted coaches (44.6%) and athletic trainers (55.9%) or both, “always” or “sometimes”, consulted coaches (92.8%) and athletic trainers (93.8%). Intercollegiate wrestlers reported when deciding whether or not to compete while injured, the two social support groups that were most frequently “never” consulted were teammates (26.7%) and physicians (34.9%). Consult Table 6 for details on each of the social network sources and consultation. Thus, intercollegiate wrestlers are more likely to consult coaches and athletic trainers than teammates and physicians when deciding to compete while injured.

Table 6

*Frequency of Consultation of Social Network Sources by Intercollegiate Wrestlers*

		<b>Frequency</b>	<b>Percent</b>
<b>Coaches</b>	Always	87	44.6
	Sometimes	94	48.2
	Never	11	5.6
<b>Teammates</b>	Always	21	10.8
	Sometimes	119	61.0
	Never	52	26.7
<b>Athletic Trainer</b>	Always	109	55.9
	Sometimes	74	37.9
	Never	9	4.6
<b>Physician</b>	Always	23	11.8
	Sometimes	101	51.8
	Never	68	34.9

**Question 3b: To what extent are various social network sources perceived by male intercollegiate wrestlers to pressure them when deciding whether to compete while injured?**

Coaches (69.5%) and teammates (63.5%) were reported to “always” or “sometimes” pressure intercollegiate wrestlers to compete when injured; whereas 20.8% of athletic trainers and 10.9% of physicians were sources of pressure “always” or “never”. Consult Table 7 for details on each of the social network sources and pressure.

Table 7

*Frequency of Pressure from Social Network Sources by Intercollegiate Wrestlers*

		<b>Frequency</b>	<b>Percent</b>
<b>Coaches</b>	Always	32	16.4
	Sometimes	100	51.3
	Never	58	29.7
<b>Teammates</b>	Always	17	8.7
	Sometimes	105	53.8
	Never	70	35.9
<b>Athletic Trainer</b>	Always	5	2.6
	Sometimes	35	18.2
	Never	152	79.2
<b>Physician</b>	Always	0	0
	Sometimes	21	10.8
	Never	171	87.7

**Question3c: To what extent are various social network sources perceived by male intercollegiate wrestlers to advise them against competing while injured?**

While a parallel set of questions with respect to advisement against competing while injured were asked, it became apparent in the administration of surveys and analysis of the data that participants misunderstood this set of questions and thus no analyses were conducted on this data.

**Question 4: What relationships are there between specific components of injury (frequency of injury, frequency of surgery, and severity of worst injury) and frequency of pressure from social network sources?**

An imperative research question led to the investigation of the relationship between the major components of injury, frequency and severity, and the pressure that

male intercollegiate wrestlers may feel when deciding to compete while injured, Pearson product-moment correlation coefficients were used. The members of the social network were referenced in question 3 as coaches, teammates, athletic trainers and physicians.

**Question 4a: Is there a relationship between frequency of injury and frequency of pressure from social network sources?**

The relationship between the frequency of injury (as measured by item b of the RBCSI, range 0 to 10 injuries,  $M = 3.03$ ,  $SD = 2.50$ ) and pressure felt by intercollegiate wrestlers from the social network sources when deciding whether to compete while injured (as measured by items 5 through 8 of the Sport Network Pressure and Support Questionnaire, mean and standard deviations represented in Table 8 for all social network sources) was investigated using Pearson product-moment correlation coefficients.

Table 8

*Means and Standard Deviations for Frequency of Pressure by Social Network Sources*

	<b>Coaches</b>	<b>Teammates</b>	<b>Athletic Trainer</b>	<b>Physician</b>
<b>Mean</b>	2.14	2.28	2.77	2.89
<b>Std. Deviation</b>	.68	.62	.48	.31

There was a moderate, positive correlation between frequency of injury and pressure by coaches,  $r = .33$ ,  $r^2 = .11$ ,  $n = 186$ ,  $p < .01$ , 95% CI [.19, .45] with higher frequencies of injury associated with higher frequency of pressure by coaches. Frequency of injury helps to explain 11% of the variance in wrestlers' reported pressure by coaches when deciding to compete while injured. A weak but significant, positive correlation was found between frequency of injury and pressure by teammates,  $r = .21$ ,  $r^2 = .04$ ,  $n = 188$ ,

$p < .01$ , 95% CI [.07, .34] with higher frequencies of injury associated with higher frequency of pressure by teammates. Frequency of injury helps to explain four percent of the variance in wrestlers' reported pressure by coaches when deciding to compete while injured. In addition, there was a weak but significant, positive correlation between frequency of injury and pressure by athletic trainer,  $r = .16$ ,  $r^2 = .02$ ,  $n = 188$ ,  $p < .05$ , 95% CI [.02, .29] with higher frequencies of injury associated with higher frequency of pressure by the athletic trainer. Frequency of injury helps to explain nearly two percent of the variance in wrestlers' reported pressure by athletic trainer when deciding to compete while injured. No significant relationship was found between frequency of injury and frequency of pressure by physicians.

**Question4b: Is there a relationship between frequency of surgery and frequency of pressure from social network sources?**

The relationship between frequency of surgery (as measured by item 4 of the demographics questionnaire, range 0 to 3,  $M = .45$ ,  $SD = .75$ ) and pressure felt by intercollegiate wrestlers from the social network sources when deciding whether to compete while injured (as measured by items 5 through 8 of the Sport Network Pressure and Support Questionnaire, mean and standard deviations represented for all social networks sources represented in Table 8) was investigated using Pearson product-moment correlation coefficients. There was a weak but significant, positive correlation between frequency of surgery and pressure by physician,  $r = .14$ ,  $r^2 = .02$ ,  $n = 192$ ,  $p < .05$ , 95% CI [.001, .28] with higher frequencies of surgery associated with higher frequency of pressure by the physician. Frequency of surgery helps to explain two

percent of the variance in wrestlers' reported pressure by physicians when deciding to compete while injured. No significant relationships seen between frequency of surgery and frequency of pressure by coaches, teammates or athletic trainer.

**Question4c: Is there a relationship between severity of worst injury and frequency of pressure from social network sources?**

The relationship between severity of worst injury via time loss (as measured by item 5 of the demographics questionnaire, number of intercollegiate wrestlers in each category can be seen in Table 5) and pressure felt by intercollegiate wrestlers from the social network sources when deciding whether to compete while injured (as measured by items 5 through 8 of the Sport Network Pressure and Support Questionnaire, mean and standard deviations represented in Table 8 for all social network sources) was investigated using Pearson product-moment correlation coefficients. There was a moderate, positive correlation between amount of time loss due to the worst injury experienced during intercollegiate wrestling career and pressure by coaches,  $r = .31$ ,  $r^2 = .10$ ,  $n = 190$ ,  $p = .01$ , 95% CI [.18, .43] with higher amounts of time loss due to injury associated with higher frequency of pressure by coaches. Amount of time loss due to worst injury helps to explain 10 percent of the variance in wrestlers' reported pressure by coaches when deciding to compete while injured. No significant relationships seen between amount of time lost and frequency of pressure by teammates, athletic trainer, or physician.

## Summary of Significant Results

Highlighted below are some of the more significant results.

### 1. Does a wrestler's self-reported capacity to perform while in pain predict risk behavior conformity in sport injury?

- The only SIP belief measure that was a statistically significant predictor of RBCSI Deceit Behaviors was that of SIP Coping ( $\beta = -.30, p = .001$ ).
- There were two belief measures that were statistically significant predictors of RBCSI Impression Management Behaviors, SIP Coping ( $\beta = -.20, p = .022$ ) and SIP Catastrophizing ( $\beta = -.23, p = .01$ ).

### 2. What relationships are there between specific components of injury and use of healthy, deceit, or impression management behaviors?

- There was a moderate, positive correlation between injury frequency and RBCSI Healthy Behaviors,  $r = .42, r^2 = .17, p < .01, 95\% \text{ CI } [.29, .53]$ .
- There was a weak but significant, positive relationship between frequency of surgery and use of RBCSI Healthy Behaviors,  $r = .23, r^2 = .33, p < .01, 95\% \text{ CI } [.09, .36]$ .

### 3. To what extent do male intercollegiate wrestlers use various social network sources when deciding whether to complete while injured?

- The two social network sources most frequently “always” consulted by wrestlers were coaches (44.6%) and athletic trainers (55.9%).
- Coaches (69.5%) and teammates (63.5%) were reported to “always” or “sometimes” pressure intercollegiate wrestlers to compete when injured.

**4. What relationships are there between specific components of injury and frequency of pressure from social network sources?**

- There was a moderate, positive correlation between frequency of injury and pressure by coaches,  $r = .33$ ,  $r^2 = .11$ ,  $n = 186$ ,  $p < .01$ , 95% CI [.19, .45].
- A weak but significant, positive correlation was found between frequency of injury and pressure by teammates,  $r = .21$ ,  $r^2 = .04$ ,  $n = 188$ ,  $p < .01$ , 95% CI [.07, .34].
- A weak but significant, positive correlation between frequency of injury and pressure by athletic trainer,  $r = .16$ ,  $r^2 = .02$ ,  $n = 188$ ,  $p < .05$ , 95% CI [.02, .29].
- There was a weak but significant, positive correlation between frequency of surgery and pressure by physician,  $r = .14$ ,  $r^2 = .02$ ,  $n = 192$ ,  $p < .05$ , 95% CI [.001, .28].
- There was a moderate, positive correlation between amount of time loss due to the worst injury experienced during intercollegiate wrestling career and pressure by coaches,  $r = .31$ ,  $r^2 = .10$ ,  $n = 190$ ,  $p = .01$ , 95% CI [.18, .43].

## CHAPTER FIVE

### Discussion

The aim of this study was to examine the playing with injury subculture surrounding elite level wrestling through examining pain beliefs, risk behavior conformity, components of injury, and social network influences. The decision to compete while injured is one that identifies with the sport ethic. Based on the premise of the sport ethic, athletes make sacrifices to compete, strive for distinction, and accept risks to play through pain (Hughes & Coakley, 1991). When viewed in context with the components of injury and the influences of the social network, the use of behavioral strategies provides insight into the athlete's degree of control about decisions regarding competing while injured. While sport is focused on the athlete and the outcome of competition, there exists great opportunity for those within an athlete's social network to impact their decisions and, in turn, their behaviors. High rates of injury associated with competitive sport (Hootman et al., 2007), increases the likelihood that an athlete at elite levels of competition will have the opportunity to use healthy, deceitful or impression management behavior strategies.

The normalization of pain and injury within sport creates a subculture in which athletes are pushed, both consciously and subconsciously, to compete while injured. Athletes live in an environment that breeds competitiveness and winning at all costs. It is the athletes' social subculture that has the most influence on decision-making about competing while injured and behaviors they ascribe to in order to compete. Thus, it is necessary to consider the sociological culture of sport that encourages ignoring injury in

pursuit of victory (Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998). The dynamic of competing while injured was examined in this study, in terms of beliefs associated with the components of injury, one's capacity of perform with pain, risk behavior conformity, social network influence. This section will discuss the results in relation to past research, implications of the findings, recommendations for future research and limitations of this study.

### **Discussion of Findings**

In this study, first investigated was whether an athlete's cognitions and beliefs could predict their actual behaviors in sport injury. Results negated any significant association between beliefs about capacity to perform with pain and the actual use of healthy behavior strategies. Unfortunately, no relationship could be shown then between an athlete's attitude toward pain and how that may affect adherence to prescribed medical care. However, results confirmed that beliefs associated with direct coping responses (SIPCoping), such as item one of the SIP, "I see pain as a challenge and don't let it bother me," predicted the use of deceitful behaviors such as item six of the RBCSI, "Decided not to seek medical advice for fear of losing your playing time or status." Additional, results confirmed two belief measures, direct coping responses and tendency to be overwhelmed by pain (SIPCatastrophizing) such as item four of the SIP, "When injured, I pray for the pain to stop," predicted the use of impression management behaviors such as item 20 of the RBCSI, "Hidden from others the actual amount of pain medication you were taking." This is evidence of embracing sport ethic beliefs associated with the coping and catastrophizing thought processes is directly related to undesirable behaviors

of deceiving others and the use of perception control. Mixed results pertaining to beliefs about performing while in pain and behaviors associated with competing while injured provide room for further inquiry as multiple factors outside of beliefs may contribute to an athlete's actions during time of injury.

The second group of research questions determined whether relationships existed between the components of injury and the use of healthy, deceit or impression management behaviors. Results confirmed that higher frequencies of injury were associated with the more likely use of healthy behavior strategies. Moreover, higher frequencies of surgery were associated with the more likely use of healthy behaviors strategies. These findings suggest that despite competing while injured, the more frequently an athlete finds himself injured and the more severely he is injured (requirement of surgery) the more likely he is to have engaged in positive and health promoting activities, i.e., compliance with athletic trainer and physician recommendations. Elite level wrestlers have regular access to athletic trainers and physicians, who can provide them information about their injury along with facilitating their adherence to treatment and rehabilitation. Based on an environment with regular access to healthcare, this could suggest a learning process takes place as the number of injuries and surgeries increases. This was an unexpected finding based on the newness of the development of the RBCSI looking at the promotion of healthy behaviors as well as potentially health damaging conformity behaviors.

Severity of injury measured via time loss and the three risk behavior conformity subscales yielded significant differences across the board. The major distinction seen

was that those who had missed time for an injury, irrespective of time, showed more likely use of healthy, deceit and impression management behaviors versus those have never been injured. The other major distinction was almost all groups who had missed time due to injury showed more likely use of healthy, deceit, and impression management behaviors versus those were injured but who had never missed time. Previous research agreed with these findings and revealed that athletes engaging in a greater number of behaviors associated with the sport ethic was associated with both a greater number of injuries and greater severity of injury (Shipherd, 2010). However, in the case of the Shipherd study, severity was measured by a multitude of factors such as self-reported surgery, visit to physician/hospital, modification to play, no medical attention, and playing/practice time missed due to injury.

The third area of interest was that wrestlers in the present study reported consulting a variety of social network sources when deciding to compete while injured. Not surprisingly, the two highest frequency groups wrestlers reported “always” consulting were that of coaches (44.6%) and athletic trainers (55.9%). This is consistent with the idea that coaches are the “central figure of the athletic subcultures and social networks of athletes” (Nixon, 1994a, p.80). Since the athletic trainer is the healthcare professional diagnosing, treating, and creating rehabilitation for the athlete, they provide constant feedback to the athlete through the injury process (National Athletic Trainers Association, 2012). Thus, coaches and athletic trainers are two groups crucial for an athlete to identify as part of their trusted support system.

The fourth research question of the present study involved which social network

sources wrestlers felt pressured by when deciding to compete while injured. Wrestlers reported “always” or “sometimes” feeling pressured by their coaches 67.7% of the time and feeling pressured by their teammates 63.5% of the time when deciding to compete while injured. This is consistent with the findings of Nixon’s 1994b study on social pressure and support where 49.7% of athletes surveyed felt pressure from coaches to play hurt. Shaffer’s 1996 study on the motivations of athletes to wrestle with pain found that 37% of high school wrestler participants felt pressure from coaches to return to competition despite experiencing their worst injury. These results provide further support that while the majority of coaches say they care for the health of athletes, they explicitly and implicitly encourage and expect athletes to take risks in order to compete (Nixon, 1994a; Roderick, 1998). The need for intervention with coaches in terms of education about how athletes interpret pressure is evident.

An athlete’s teammates are also immersed within the same culture of risk identity (Hughes & Coakley, 1991), so it was not surprising that wrestlers in the present study identified them as the second greatest source of pressure (63.5% of “always” or “sometimes”) when deciding to compete while injured. The pressure felt by wrestlers from teammates is unique in the sense that teammates share all of the same, albeit distinct experiences of that particular team except injury. Teammates may verbally often express distain for one who admits their injury, which would suggest that they would find a way to deal with it and preserve “unlike” the currently injured teammate. Nippert’s work found that 69% of adolescent gymnasts would continue or would expect their teammates to continue sport participation when injured. Similar to these results, Nixon’s (1994b)

study on social pressure in college sports networks 41% of athletes felt pressure to compete with injury from teammates. Note that Nixon's 1994b study simply recorded if athletes felt pressure or not, versus the refinement of the present study which provided the frequency at which wrestlers felt pressured.

While this study involved an elite level of competition that may receive criticism for equally being immersed in the sport ethic and winning rather than the general welfare of the athlete as documented by Safai in Canada, the majority of participants never felt pressured by their medical professionals. Wrestlers reported that when deciding to compete while injured that they "never" felt pressure from the athletic trainer, the individual evaluating and treating their injuries, 79.2% of the time. Another finding was that wrestlers reported 87.7% of the time "never" feeling pressure from their physician to compete while injured. In fact, out of the 195 male intercollegiate wrestlers surveyed not one reported that they "always" feel pressured by their physician to compete while injured. Previous research (Anderson, 2007) has questioned whether an athlete has been coerced to return by a physician or if their decision to return was made freely; the current study suggests that physicians are not the social network source pushing for athletes to return at this level of competition.

The frequency of injury that participants experienced was correlated with amount of pressure felt when deciding to compete while injured from coaches, teammates and athletic trainers. A moderate correlation was seen from coaches in terms of higher frequencies of injury and higher frequencies of pressure, while weak but significant correlations were seen with teammates and athletic trainers showing that wrestlers felt

more frequent pressure from these groups associated with higher frequencies of injury. Based on the increased frequency of the injury, it may provide more opportunity for athletes to be sensitive to the pressure that may be placed on them from these various social network sources. The history and frequency of injury may lead athletes to be fearful that they may be discarded as damaged goods with the possibility of a scholarship being revoked.

In terms of surgical intervention, there was a weak but significant correlation between higher frequencies of surgery associated with higher frequency of pressure by the physician. Provided the low frequency of pressure from physicians with 10.8% of participants feeling pressure “sometimes” and none feeling pressure “always,” these results may be indicative that those who have more interaction with their physician based on appointments associated with surgical intervention have an increased amount of exchanges to feel pressure to compete while injured. A physician may show confidence in his or her surgical intervention behind the premise “you are fixed now” while the athlete does not have that same confidence and feel pressure from the physician to compete.

The only relationship seen between severity of injury via time loss and social network sources was a moderate correlation with higher amounts of time loss due to injury associated with higher frequency of pressure by coaches. The possibility exists that the longer an athlete is injured the more frequently they have heard messages from coaches associated with conformity to the sport ethic and frequently feel more pressure. Coaches may be concerned with malingering and encourage an athlete to push through

injury. When deciding to compete while injured, coaches may express their feelings, expectations, and even with consistent encouragement over time athletes may interpret the encouragement as pressure (Nixon, 1994a).

### **Future Directions and Limitations**

This study provided new insight into the healthy behaviors that athletes utilize throughout the injury process. This was the first time that the use of healthy behaviors has been used in the development of the RBCSI questionnaire. Considering the results from this study and the fact that the use of healthy behaviors was associated with higher frequencies of injury and higher frequencies of surgery, it is recommended that future research focus on both healthy and potentially damaging conformity behaviors. This research strategy allows identification and evaluation of the contrasting strategies of health promoting and health detracting behaviors, an essential aspect to consider if the goal is to remold the subculture in healthier ways that still do not sacrifice performance.

The development of instruments used in this study was done to meet the specifications of the general athlete population. Thus, it is believed by the researcher that the findings are relative to the general athlete population rather than only NCAA Division I wrestlers. However, there is some contention that variables such as gender differences and sport type, contact vs. non-contact, may play a role in an athlete's experience with injury, pain, and risk conformity behavior (Collins, Fields, & Comstock, 2008; Pike & Maguire, 2003; Young et al., 1994). Thus, a limitation of this study, despite the large number of participants, was that of being a homogenous single gender, single sport, and single level of participation sample.

As data collection was done during the summer and early fall months, no participating wrestling program had all members of the team available. The participants were a reflection of those wrestlers who were on campus training and available at the time of data collection on the particular day that data was collected. As data collection was done prior to the official start of the wrestling season, all workouts were voluntary. There were various reasons for the particular sample to be available such as summer employment, summer coursework, proximity to family home, training opportunity, etc. However, the bias exists that the wrestlers who were available were those that identify with the sport ethic by sacrificing to stay near campus to train and improve their skills in hopes of being more successful the following season. If this interpretation is correct, the wrestlers that participated may ascribe to different beliefs, behaviors, and social influence than those who were not available during data collection.

In order to provide anonymity, all injury data were collected via self-report without specific injury details. Future research may want to include a qualitative portion that allows athletes to include information on each injury experienced including but not limited to type of injury (acute vs. chronic), involvement of various healthcare professionals, surgery, time loss, and a questionnaire regarding their interpretation of social pressure to compete. More detailed injury data would provide greater insight into the type of injury that athletes utilize specific behaviors.

Limitations existed in reference to the lack of data concerning overall health status. For example, general medical conditions such as anemia, asthma, diabetes, weight loss, nutrition, etc. could play a role in the athlete's beliefs and behaviors with respect to

injury as well as the influence of their social network sources. Specific to the sport of wrestling is the requirement to compete within a weight class, which directly impacts weight loss and nutrition. The NCAA and the NWCA (National Wrestling Coaches Association) have mandated the use of the Optimal Performance Calculator (OPC), which evaluates a wrestler's body fat, weight, and hydration level in order to determine a weight that is safe and optimal for performance. The majority of wrestlers cut weight prior to competition. The amount of weight a wrestler can cut is based upon the OPC evaluation prior to the first official team practice and monitored throughout the session at each competition weigh in. However, the cutting of weight for competition may also impact an injury directly through impairment of the healing process or indirectly through beliefs and behaviors associated with competing while injured.

Future research studies should be open to areas concerning athletes' self-reflection after competing while injured. For instance, one might ask whether athletes believe they would choose the same set of behaviors again (as was done in the first version of the RBCSI, interestingly, with a very high correlation shown between past and predicted future behaviors, Kenow & Wiese-Bjornstal, 2010). Also, if given the opportunity to compete while injured more than once in their career, researchers could ask how their behaviors were altered over time as well as the difference in terms of pressure felt from social network sources in various situations.

The results of this study were unable to be stratified specific to each wrestler's elite vs. non-elite status due to the protection of anonymity of the participants. Future studies could provide information about how athletes' beliefs, behaviors and the impact

of social network sources are affected by “elite” status in respect to scholarships, winning record, All-American status, team ranking, etc.

Based on the findings associated with frequency of consultation and pressure by social network sources, these social network sources should be cautious about guidance given to athletes concerning their participation during a time of injury. While fully submersed in the culture of sport ethic, coaches hold a powerful role with the influence they can have on an athlete. Yet coaches are under pressure from their university to produce winning teams. Administrators and healthcare professionals should be aware of the pressure athletes may feel from their coaches when deciding to compete while injured, in order to provide a checks and balances system for the health of their athletes.

Further consideration should be given to social network sources that were not included in this study. Other sources may include parents, strength and conditioning coaches, exercise physiologists, personal trainers, nutritionists, and sports psychologists. Specific to the pressure questions, addition of “self” as a source of pressure could be added. Particular to each athlete’s background there are different social network sources that may provide various levels of influence in respect to time, level, gender, sport, etc. Thus, it is important to continue to evaluate the influence of these social network sources with multiple samples.

## **Conclusion**

This thesis was conceived with the aim to examine the subculture surrounding elite level wrestling as evidence by the pain beliefs, risk behavior conformity, components of injury, and social network sources. In doing so, it touches on the

normalization of pain and injury, the sport ethic and social support as well provides the largest survey of NCAA wrestlers currently available. The study confirmed wrestler beliefs associated with direct coping responses (SIP Coping) predicted the more likely use of deceitful and impression management behaviors (RBCSI Deceit and RBCSI Impression). Wrestler beliefs associated with the tendency to be overwhelmed by pain (SIP Catastrophizing) predicted more likely use of impression management behaviors as well (RBCSI Impression). Higher frequencies of injury and surgery were associated with the more likely use of positive and health promoting behaviors (RBCSI Healthy). The most frequent social network sources consulted were coaches and athletic trainers while the most frequent social network sources that wrestlers felt pressured by were coaches and teammates. Through this study, insight has been found about how athletes' beliefs about performing with pain, their behaviors, and the interaction of social network sources impact an athlete's decision to compete while injured. As evident from this research, there is a body of knowledge concerning athletes' injury behaviors and what influences those behaviors that will continue to emerge.

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## Appendix A

### Demographic Questionnaire

Please respond to each of the following questions based on your intercollegiate wrestling experience by circling the answer that best describes you.

1. How many years of intercollegiate wrestling have you completed, including a redshirt year?
  - a. One year
  - b. Two years
  - c. Three years
  - d. Four years
  - e. Five years
  
2. What is your current age?
  - a. 18 years
  - b. 19 years
  - c. 20 years
  - d. 21 years
  - e. 22 years
  - f. 23 years
  - g. 24 years
  - h. 25 years
  
3. How many injuries have you sustained through your intercollegiate career that your athletic trainer and/or physician evaluated?
  - a. Never been injured
  - b. 1-4 injuries
  - c. 5-8 injuries
  - d. 9-12 injuries
  - e. 13 or more injuries
  
4. How many surgeries related to your intercollegiate wrestling participation have you undergone?
  - a. Never had surgery
  - b. 1 surgery
  - c. 2 surgeries
  - d. 3 surgeries
  - e. 4 surgeries
  - f. 5 or more surgeries
  
5. In terms of the worst injury that you experienced during your intercollegiate wrestling career, how long were you unable to participate in regular practice and/or competition? Please circle the one that you MOST identify with.
  - a. Never been injured/Does not apply
  - b. Never missed time for an injury
  - c. 1-3 days
  - d. One week
  - e. One month
  - f. Three months
  - g. Six months or longer

**Appendix B**  
**SPORTS INVENTORY FOR PAIN (SIP)**

**Sports Inventory for Pain**

Below is a list of statements that describe the way wrestlers often feel about pain and its influence on competition. Please read each statement carefully, so that we may find out how you feel toward pain as an intercollegiate wrestler. Then circle the number that that best describes your feelings at this time. Please answer honestly. There are no right or wrong answers.

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
I see pain as a challenge and don't let it bother me. [COP]	1	2	3	4	5
I owe it to myself and those around me to perform even when my pain is bad. [COP]	1	2	3	4	5
When in pain, I tell myself it doesn't hurt. [COG]	1	2	3	4	5
When injured, I pray for the pain to stop. [CAT]	1	2	3	4	5
If I feel pain during an athletic activity, it's probably a sign that I'm doing damage to my body. [AVD]	1	2	3	4	5
I have little or no trouble with my muscles twitching or jumping. [BA]	1	2	3	4	5
At this point, I am more interested in returning to my sport than in trying to stop any pain. [COP]	1	2	3	4	5
When in pain, I imagine that the pain is outside my body. [COG]	1	2	3	4	5
My pain is terrible and I feel it's never going to get better. [CAT]	1	2	3	4	5
I could perform as well as ever if my pain would go away. [AVD]	1	2	3	4	5
I do not worry about being injured. [BA]	1	2	3	4	5

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
Pain is just a part of competition. [COP]	1	2	3	4	5
When hurt, I play mental games with myself to keep my mind off the pain. [COG]	1	2	3	4	5
When in pain, I worry all the time about whether it will end. [CAT]	1	2	3	4	5
I have to be careful not to make my pain worse. [AVD]	1	2	3	4	5
I seldom or never have dizzy spells or headaches. [BA]	1	2	3	4	5
When I am hurt, I just go on as if nothing happened. [COP]	1	2	3	4	5
When in pain, I replay in my mind a pleasant athletic experience from my past. [COG]	1	2	3	4	5
If in pain, I often feel I can't stand it anymore. [CAT]	1	2	3	4	5
The worse thing that could happen to me is to injure/reinjure myself. [AVD]	1	2	3	4	5
I seldom notice minor injuries. [BA]	1	2	3	4	5
When injured, I tell myself to be tough and carry on despite the pain. [COP]	1	2	3	4	5
When hurt, I do anything to get my mind off the pain. [COG]	1	2	3	4	5
When hurt, I tell myself I can't let the pain stand in the way of what I want to do. [COP]	1	2	3	4	5
No matter how bad the pain gets, I know I can handle it. [COP]	1	2	3	4	5

[COP=Coping, COG=Cognitive, AVD=Avoidance, CAT=Catastrophizing, BA=Body Awareness]



ITEM #	<i>During your own intercollegiate wrestling injury experiences have you:</i>	<b>DOES NOT APPLY</b>	<b>NO</b> <i>have not done it</i>	<b>SORT OF</b> <i>in a way have done it</i>	<b>YES</b> <i>definitely have done it</i>
14.	Taken recommended time off from training or competition to allow an injury to heal?	DOES NOT APPLY	NO	SORT OF	YES
15.	Used over-the-counter pain medications at a HIGHER than recommended dose to play through the pain of injury?	DOES NOT APPLY	NO	SORT OF	YES
16.	Competed when injured because you thought it was your last opportunity to do so?	DOES NOT APPLY	NO	SORT OF	YES
17.	Pushed yourself to train or compete when injured?	DOES NOT APPLY	NO	SORT OF	YES
18.	Done significantly MORE rehabilitation exercises than prescribed by medical providers?	DOES NOT APPLY	NO	SORT OF	YES
19.	Considered your long term health when making a decision about whether or not to play when injured?	DOES NOT APPLY	NO	SORT OF	YES
20.	Hidden from others the actual amount of pain medication you were taking?	DOES NOT APPLY	NO	SORT OF	YES
21.	Played with an injury so that you would not let others down or feel guilty about not playing?	DOES NOT APPLY	NO	SORT OF	YES
22.	Competed when injured due to the media attention focused on you or your team?	DOES NOT APPLY	NO	SORT OF	YES
23.	Chosen not to complete the rehabilitation exercises prescribed to you by medical providers?	DOES NOT APPLY	NO	SORT OF	YES
24.	Discussed with a coach how to adapt your training and competition while recovering from injury?	DOES NOT APPLY	NO	SORT OF	YES
25.	Taken LESS medication than recommended because you thought you could tough out the pain?	DOES NOT APPLY	NO	SORT OF	YES
26.	Not reported an injury because in the past your medical concerns were not taken seriously?	DOES NOT APPLY	NO	SORT OF	YES
27.	Played while injured because of the praise or acknowledgment you received for doing so?	DOES NOT APPLY	NO	SORT OF	YES
28.	Returned to play after injury even though you did not feel ready?	DOES NOT APPLY	NO	SORT OF	YES
29.	Asked questions of a medical provider or coach about your injury and how it affects your training and competition?	DOES NOT APPLY	NO	SORT OF	YES

<b>ITEM #</b>	<b><i>During your own intercollegiate wrestling injury experiences have you:</i></b>	<b><i>DOES NOT APPLY</i></b>	<b><i>NO have not done it</i></b>	<b><i>SORT OF in a way have done it</i></b>	<b><i>YES definitely have done it</i></b>
30.	Used banned substances such as steroids, growth hormones, or other ergogenic aids to heal more quickly or compete while injured?	DOES NOT APPLY	NO	SORT OF	YES
31.	Not told the whole truth of your injury symptoms to a parent, coach, or medical provider?	DOES NOT APPLY	NO	SORT OF	YES
32.	Advised an injured teammate to continue training or competing while injured?	DOES NOT APPLY	NO	SORT OF	YES
33.	Risked your long term health by training or competing while injured?	DOES NOT APPLY	NO	SORT OF	YES
34.	Looked at online or print medical information about your injury?	DOES NOT APPLY	NO	SORT OF	YES
35.	Received lidocaine or other injections for the main purpose of allowing you to play while injured?	DOES NOT APPLY	NO	SORT OF	YES
36.	Decided on your own that your injury was not serious enough to report?	DOES NOT APPLY	NO	SORT OF	YES
37.	Told a coach you were fine and ready to compete even though you were still feeling symptoms of your injury?	DOES NOT APPLY	NO	SORT OF	YES
38.	Purposely skipped icing or other recommended treatment sessions while injured?	DOES NOT APPLY	NO	SORT OF	YES
39.	Readjusted your training goals because of your injury?	DOES NOT APPLY	NO	SORT OF	YES
40.	Taken prescription pain medications or other drugs prescribed to you to allow you to play through the pain of injury?	DOES NOT APPLY	NO	SORT OF	YES
41.	Not told anyone that you were hurt, when you were?	DOES NOT APPLY	NO	SORT OF	YES
42.	Felt guilty about not training or competing when injured?	DOES NOT APPLY	NO	SORT OF	YES
43.	Avoided surgery or other recommended medical or rehabilitative procedures so that you could keep competing?	DOES NOT APPLY	NO	SORT OF	YES
44.	Talked with your parents or other family members about your injury concerns?	DOES NOT APPLY	NO	SORT OF	YES
45.	Ignored medical provider advice to rest for injury recovery?	DOES NOT APPLY	NO	SORT OF	YES

### FINAL 3 FACTOR SOLUTION:

Deceit Behaviors: Items 6, 31, 36, 37, 38, 41, 42

Impression Management Behaviors: Items 16, 20, 21, 22, 27, 32, 35

Healthy Behaviors: Items 4, 9, 14, 19, 24, 29, 44

## Appendix D

### SPORT NETWORK PRESSURE AND SUPPORT QUESTIONNAIRE

#### Sport Network Pressure and Support Questionnaire

Please respond to the following, based on your intercollegiate wrestling experiences, concerning the frequency at which you interact with the members of your sportsnet, i.e athletic social support group, when injured.

1. When deciding whether to compete while injured, do you consult your coaches?  

Always	Sometimes	Never
--------	-----------	-------
2. When deciding whether to compete while injured, do you consult your teammates?  

Always	Sometimes	Never
--------	-----------	-------
3. When deciding whether to compete while injured, do you consult your athletic trainer?  

Always	Sometimes	Never
--------	-----------	-------
4. When deciding whether to compete while injured, do you consult your physician?  

Always	Sometimes	Never
--------	-----------	-------
5. When deciding whether to compete while injured, do you feel pressured by your coaches?  

Always	Sometimes	Never
--------	-----------	-------
6. When deciding whether to compete while injured, do you feel pressured by your teammates?  

Always	Sometimes	Never
--------	-----------	-------
7. When deciding whether to compete while injured, do you feel pressured by your athletic trainer?  

Always	Sometimes	Never
--------	-----------	-------
8. When deciding whether to compete while injured, do you feel pressured by your physician?  

Always	Sometimes	Never
--------	-----------	-------
9. When deciding whether to compete while injured, do your coaches advise against competing?  

Always	Sometimes	Never
--------	-----------	-------
10. When deciding whether to compete while injured, do your teammates advise against competing?  

Always	Sometimes	Never
--------	-----------	-------
11. When deciding whether to compete while injured, does your athletic trainer advise against competing?  

Always	Sometimes	Never
--------	-----------	-------
12. When deciding whether to compete while injured, does your physician advise against competing?  

Always	Sometimes	Never
--------	-----------	-------

**Appendix E**  
**CONSENT FORM**  
**COMPETING WHILE INJURED: IS IT A WRESTLER'S DECISION**

You are invited to be in a research study examining the relationship between competing with injury, social influences and associated risk. You were selected as a possible participant due to your status of a NCAA Division 1 wrestler. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Shelby Hoppis, master's student in the Kinesiology Department at the University of Minnesota.

**Background Information**

The purposes of this research project are to examine the relationship between wrestlers' beliefs concerning performing with pain and the decision to accept the specific risk of competing while injured and evaluate whether this acceptance is voluntary or if pressure from social influences contribute to this decision.

**Procedure**

If you agree to participate, we would ask you to do the following. We ask you to answer the survey questions in respect to your intercollegiate wrestling experience about completing with injury. These questions should be answered within our meeting time today.

**Risks and Benefits of being in the Study**

This study has no known physical or psychological risks. There are no direct benefits to the participants; however your responses may help in developing strategies to educate those who have social influence in sport as well as those who discuss behaviors associated with sport injury.

**Compensation**

There is no compensation provided to the subjects for this study.

**Confidentiality**

The personal information received in this research project will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Information with identifying factors will be stored securely and only researchers will have access to the records.

### **Voluntary Nature of the Study**

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or the intercollegiate wrestling program that you are a part of. If you decide to participate, you are free to not answer any question or withdraw at any time without penalty and without affecting those relationships.

### **Contacts and Questions:**

The researcher conducting this study is Shelby Hoppis. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at 650-452-3503 or hoppis005@umn.edu. If you would like to address questions to the researcher's advisor please contact Dr. Diane Wiese-Bjornstal at 612-625-6580 or dwiese@umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. SE, Minneapolis, MN 55455; 612-625-1650.

*You will be given a copy of this information to keep for your records.*

### **Statement of Consent:**

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of Investigator: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix F IRB APPROVAL LETTER

### UNIVERSITY OF MINNESOTA

*Twin Cities Campus*

*Human Research Protection Program  
Office of the Vice President for Research*

*1525 Mayo Memorial Building  
125 Delaware Street S.E.  
MMC 521  
Minneapolis, MN 55455  
Office: 612-626-3671  
Fax: 612-626-9061  
Email: [irb@umn.edu](mailto:irb@umn.edu) or [irb@tc.umn.edu](mailto:irb@tc.umn.edu)  
Website: <http://www.umn.edu/ethics/irb/>*

05/05/2011

Shelby A Hoppis  
Intercollegiate Athletics  
Room 250 BFAB  
516 15th Ave S E  
Minneapolis, MN 55455

RE: "Competing while injured: Is it a wrestler's decision?"  
IRB Code Number: **1104P98554**

Dear Ms. Hoppis:

The Institutional Review Board (IRB) received your response to its stipulations. Since this information satisfies the federal criteria for approval at 45CFR46.111 and the requirements set by the IRB, final approval for the project is noted in our files. Upon receipt of this letter, you may begin your research.

IRB approval of this study includes the consent form and recruitment e-mail, both received April 18, 2011.

The IRB would like to stress that subjects who go through the consent process are considered enrolled participants and are counted toward the total number of subjects, even if they have no further participation in the study. Please keep this in mind when calculating the number of subjects you request. This study is currently approved for 300 subjects. If you desire an increase in the number of approved subjects, you will need to make a formal request to the IRB.

For your records and for grant certification purposes, the approval date for the referenced project is April 27, 2011 and the Assurance of Compliance number is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003). Research projects are subject to continuing review and renewal; approval will expire one year from that date. You will receive a report form two months before the expiration date. If you would like us to send certification of approval to a funding agency, please tell us the name and address of your contact person at the agency.

As Principal Investigator of this project, you are required by federal regulations to inform the IRB of any proposed changes in your research that will affect human subjects. Changes should not be initiated until written IRB approval is received. Unanticipated problems or serious unexpected adverse events should be reported to the IRB as they occur.

The IRB wishes you success with this research. If you have questions, please call the IRB office at 612-626-5654.

Sincerely,



Christina Dobrowolny, CIP  
Research Compliance Supervisor  
CD/ks

CC: Laura Kentow, Diane Wiese-Bjornstal

## Appendix G CHANGE IN PROTOCOL APPROVAL

UNIVERSITY OF MINNESOTA

**Change In Protocol Request**

Route this form to:

See instructions below.

Rev: Jan 2010

**Instructions:**

Use this form when submitting change requests on IRB protocols. This form is for use when the changes are initiated by the PI. Do not use this form to respond when changes are requested by the IRB. Please do not use this form when responding to changes requested in a stipulation letter.

- Submit this form to the Human Research Protection Program:

**U.S. Mail Address:**

Human Research Protection Program  
MMC 820  
420 Delaware St. SE  
Minneapolis, MN 55455-0392

**Campus Mail:**

Human Research Protection Program  
MMC 820  
Minneapolis Campus

**Deliver to:**

D-528 Mayo Memorial Building  
Minneapolis Campus  
8-4:30, M-F


**IRB Protocol Information****APPROVED***By perke001 at 3:54 pm, May 23, 2011*

IRB Study Number:	1104P98554
Current Principal Investigator:	Shelby A. Hoppis
Primary Title:	Competing while injured: Is it a wrestler's decision?"
Submission Date	5/12/11

**Indicate the type of change/addition and attach all applicable documents:**

- Protocol Amendment: Version 2, Dated 5/12/11  
 Revised Investigator Brochure: Version , Dated  
 Recruitment Changes/Advertisements  
 Notice of Closure to Accrual  
 Change(s) to Study Procedures  
 Other:

- Briefly summarize the change(s). For protocol amendments, do not say "See summary of changes provided with amendment." Rather, summarize the nature of the significant revisions.

Replacing the Sport Behavior Questionnaire in the original submission with the Intercollegiate Injury Actions Questionnaire that is attached. All other surveys that were originally submitted will still be used.

- Describe the rationale for the change(s):

The Wrestling Injury Action Questionnaire is the most updated version of the Risk Behavior Conformity in Sport Injury (RBCSI) Questionnaire created by Laura Kenow and Diane Wiese-Bjornstal. The previous version of the scale was included with the original submission. The new version of the RBCSI is known here as the Intercollegiate Wrestling Injury Action Questionnaire has additional questions based on the factors that came out of the first version as well as general reformatting of the questionnaire. The additional questions are all related to and similar in context with the original questions.

- In your opinion as principal investigator, how will these changes affect the overall risk to subjects in this study?

There should be no change that would affect the overall risk to subjects in the study.

- Do the changes to the study prompt changes to the consent form(s)?

No.  Yes.

If yes, attach a copy of the revised consent form(s) with changes tracked or highlighted as well as a clean copy. Use this space to further describe consent form changes if necessary:

\_\_\_\_\_  
Principal Investigator's Signature

\_\_\_\_\_  
Date

**Appendix H**  
**DEMOGRAPHICS TABLES**

*Frequency of Years of Intercollegiate Wrestling Experience (Item 1 of Demographics)*

<b>Years Exp</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Frequency</b>	75	55	27	31	7

*Frequency of Age (Item 2 of Demographics)*

<b>Age</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>
<b>Frequency</b>	8	54	62	33	27	7	3	1

*Frequency of Injury (Item b of RBCSI)*

<b>Injuries</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
<b>Frequency</b>	26	29	46	28	14	17	14	4	5	0	8

*Frequency of Surgery (Item 4 of Demographics)*

<b>Surgeries</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Frequency</b>	131	46	12	6

*Severity of Worst Injury via Amount of Time Loss (Item 5 of Demographics)*

<b>Category</b>	<b>Never Injured</b>	<b>Never Missed Time</b>	<b>1-3 days</b>	<b>1 week</b>	<b>1 month</b>	<b>3 months</b>	<b>6 months or longer</b>
<b>Frequency</b>	20	5	26	29	49	30	36

## Appendix I

### LINEAR REGRESSION OUTPUT FOR HEALTHY BEHAVIORS

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
	INJURIES >= 1-4 INJURIES (Selected)				R Square Change	F Change	df1	df2	Sig. F Change
1	.192 <sup>a</sup>	.037	.008	3.70265	.037	1.263	5	165	.282

a. Predictors: (Constant), SIPBA, SIPCOG, SIPAVD, SIPCOPING, SIPCAT

**ANOVA<sup>b, c</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	86.596	5	17.319	1.263	.282 <sup>a</sup>
	Residual	2262.083	165	13.710		
	Total	2348.678	170			

a. Predictors: (Constant), SIPBA, SIPCOG, SIPAVD, SIPCOPING, SIPCAT

b. Dependent Variable: RBSCIHealthy

c. Selecting only cases for which INJURIES >= 1-4 INJURIES

**Coefficients<sup>a, b</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	13.207	3.408		3.875	.000	6.478	19.936
	SIPCOPING	.022	.080	.024	.275	.784	-.137	.181
	SIPCOG	.085	.122	.064	.696	.488	-.155	.325
	SIPCAT	-.027	.129	-.020	-.211	.833	-.281	.227
	SIPAVD	.242	.130	.156	1.857	.065	-.015	.500
	SIPBA	-.117	.116	-.081	-1.011	.314	-.346	.112

a. Dependent Variable: RBSCIHealthy

b. Selecting only cases for which INJURIES >= 1-4 INJURIES

## Appendix J

### LINEAR REGRESSION OUTPUT FOR DECEIT BEHAVIORS

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
	INJURIES >= 1-4 INJURIES (Selected)				R Square Change	F Change	df1	df2	Sig. F Change
1	.267 <sup>a</sup>	.071	.043	3.84194	.071	2.539	5	165	.030

a. Predictors: (Constant), SIPBA, SIPCOG, SIPAVD, SIPCOPING, SIPCAT

**ANOVA<sup>b,c</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187.369	5	37.474	2.539	.030 <sup>a</sup>
	Residual	2435.485	165	14.761		
	Total	2622.854	170			

a. Predictors: (Constant), SIPBA, SIPCOG, SIPAVD, SIPCOPING, SIPCAT  
b. Dependent Variable: RBSCIDecept  
c. Selecting only cases for which INJURIES >= 1-4 INJURIES

**Coefficients<sup>a,b</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	19.054	3.536		5.389	.000	12.073	26.036
	SIPCOPING	-.288	.083	-.298	-3.455	.001	-.453	-.124
	SIPCOG	.197	.126	.141	1.560	.121	-.052	.446
	SIPCAT	-.051	.133	-.035	-.382	.703	-.314	.212
	SIPAVD	-.149	.135	-.091	-1.103	.272	-.417	.118
	SIPBA	.158	.120	.104	1.317	.190	-.079	.396

a. Dependent Variable: RBSCIDecept  
b. Selecting only cases for which INJURIES >= 1-4 INJURIES

## Appendix K LINEAR REGRESSION OUTPUT FOR IMPRESSION MANAGEMENT BEHAVIORS

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
	INJURIES >= 1-4 INJURIES (Selected)				R Square Change	F Change	df1	df2	Sig. F Change
1	.318 <sup>a</sup>	.101	.074	4.12158	.101	3.720	5	165	.003

a. Predictors: (Constant), SIPBA, SIPCOG, SIPAVD, SIPCOPING, SIPCAT

**ANOVA<sup>b,c</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	315.963	5	63.193	3.720	.003 <sup>a</sup>
	Residual	2802.925	165	16.987		
	Total	3118.889	170			

a. Predictors: (Constant), SIPBA, SIPCOG, SIPAVD, SIPCOPING, SIPCAT

b. Dependent Variable: RBSCImpression

c. Selecting only cases for which INJURIES >= 1-4 INJURIES

**Coefficients<sup>a,b</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	26.188	3.794		6.903	.000	18.698	33.678
	SIPCOPING	-.207	.090	-.196	-2.317	.022	-.384	-.031
	SIPCOG	-.060	.135	-.039	-.442	.659	-.327	.207
	SIPCAT	-.373	.143	-.233	-2.605	.010	-.655	-.090
	SIPAVD	-.022	.145	-.012	-.148	.882	-.308	.265
	SIPBA	.098	.129	.059	.758	.449	-.157	.353

a. Dependent Variable: RBSCImpression

b. Selecting only cases for which INJURIES >= 1-4 INJURIES