ABSTRACT

GENDER, ATHLETIC IDENTITY, AND PLAYING THROUGH PAIN AND INJURY IN RECREATIONAL BASKETBALL PLAYERS.

by Daniel Paul Vernau

The psychology of injury literature has not addressed whether recreational male and female athletes have positive attitudes toward playing through injury or play through injury. The purpose of this investigation was to determine recreational basketball players’ injury attitudes and self-perceived behaviors, as a function of gender and athletic identity. Participants were 68 male and 62 female collegiate intramural basketball players, who completed the Athletic Identity Measurement Scale, Risk, Pain, & Injury Questionnaire-Rec, and a Self-Perceived Behavioral Questionnaire. Results of a factor analysis on the RPIQ-Rec indicated two factors of injury attitudes for recreational athletes. Results of a gender x athletic identity MANOVA indicated differences between high and low athletic identity in injury attitudes, and perceived playing through injury behaviors. However, no gender differences were found. Regression analyses showed athletic identity significantly predicted injury attitudes and behaviors. Results are discussed in regard to socio-psychological injury literature, and the gender similarities hypothesis.
GENDER, ATHLETIC IDENTITY, AND PLAYING THROUGH PAIN AND INJURY IN RECREATIONAL BASKETBALL PLAYERS

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CHAPTER ONE

Introduction and Literature Review

In 2006, a Reebok commercial was aired for the new Allen Iverson shoes, in which Iverson, a widely popular NBA player with Hall of Fame credentials, was shown sitting on a medical bench. Arrows began to point at parts of his body, and descriptions of injuries accompanied each arrow. By the time all of the arrows had appeared, all of the injuries that Iverson experienced in his career had been identified, then at the end of the commercial he stood up and said “time to go to work.” In a similar 2006 Adidas commercial featuring Dwyane Wade, another superstar in the NBA, highlights were shown of his career in which he would take hard falls and get up every time. The final message that appeared on the screen was “fall down seven times, get up eight.” These messages the media are trying to portray seem to show that injury is a part of sport, in this case basketball, and even the best players in the world experience pain and injury. However, the other and possibly more important message being relayed to the audience is that the best and most popular athletes, in our society that emphasizes the importance and value of sport participation, continue to participate in their sport when they are hurt.

Injury and sport have been combined throughout a wide range of literature from textbooks to medical articles as well as psychological studies. The common ideas behind the combination are that when people play sports they are more likely to get injured, and when somebody is injured they typically cannot or should not play until they recover. In terms of the first notion, a plethora of research has been conducted regarding the prevalence of injuries in sports, ranging from the sports involving least contact to those involving mostly contact, from male sports to female sports, and from child to adult athletes (Agel, Olson, Dick, Arendt, Marshall, & Sikka, 2007; Deitch, Starkey, Walters, & Moseley, 2006; Emery, Meeuwisse, & McAllister, 2006; “Youth Sports”, 2006). The message that is conveyed through this literature is that many athletes get injured, some more than others, and that although sport-related injuries may not be more prevalent than other types of injuries (Taft, 1991), prevalence of injury is a problem that needs to be addressed. In the next section of this chapter, the current research on prevalence of sport-related injuries is reviewed.

Prevalence of Sport Injuries

In order to discuss the psychology of injury literature, it is first necessary to discuss the prevalence and incidence of sport-related injuries. The following section presents general injury
numbers, followed by data based on sport-specific, injury type-specific, and age-specific contexts.

**General Injury Data.** According to Pray and Pray (2004), about seven million youth injuries occur each year, and a majority of them are a result of participation in sports. The figure of seven million a year was also found in a study conducted by Conn, Annest, and Gilchrist (2003), on participants in sports and recreation in the U.S. population. Most of those seven million injuries were found in 5-14 year olds (59.3 per 1000 persons), although 15-24 year olds were a close second on the list (56.4 per 1000 persons). Not only are those incidence rates considered high, but the rates of these two age groups greatly exceeded the overall national average of 25.9 injuries per 1000 persons, which means more attention should be paid toward these 24-and-under age groups (Conn et al., 2003). A similar study suggests that about 3.5 million child athletes seek medical treatment for some type of sport-related injury (“Youth sports,” 2006) each year, and most of those injuries come from those participating in basketball (205,400), football (185,700), baseball (108,300), and soccer (75,000). In regards to high school athletes, it was found that out of every 100 athletes there are 40.2 injuries per year that required medical attention, 49.9 per year that led to a loss of participation time in sports, 9.3 per year that led to a loss of consciousness, and 8.1 per year that required trips to the emergency room (Emery, Meeuwisse, & McAllister, 2006). The athletes studied in the survey who were injured included mostly those participating in high school basketball, hockey, soccer, and snowboarding. As these general statistics suggest, sport-related injuries are very prevalent in the US population. However, other more specific research studies have revealed that injury rates may vary as a function of several factors including sport type, injury type, and athlete age, which will all be reviewed in the following section.

**Injuries Based on Sport Type.** More specifically, certain sports present a higher risk of injuries than others. Based on the data previously presented, football and basketball have the two highest prevalence rates for sport-related injuries (“Youth sports,” 2006). These two sports have consistently presented some of the highest injury risks of any sport or recreational activity, although the literature does not agree on which sport poses a higher injury risk. Taft (1991) also illustrated that football posed one of the highest injury risks out of all possible sports, although cycling had a significantly higher injury rate (due to overuse and wear-and-tear that is essential in serious cycling). Basketball was again presented near the top of the list of high risk sports
(Taft, 1991). More specific to recreation-based sports, Conn et al. (2003) found participation in basketball to be the majority reason for trips to emergency rooms and doctors’ offices for recreational athletes within the U.S. population. In terms of adult recreational athletes, Hammig, Yang, and Bensema (2007) found that an average of 507,000 basketball-related injuries are treated in a hospital or physician’s office annually, which represented a higher rate than any other sport or recreational activity in the U.S. Saal (1991) and Pray and Pray (2004) describe football as the sport posing the highest risk, finding that up to 1.2 million football injuries occur each year (Saal, 1991), and that these injuries have accounted for up to 39% of all sport injuries (Pray & Pray, 2004). Adickes and Stuart (2004) found football to be the most risky sport as well, but they were specifically investigating serious injury.

As football is the suspected culprit for high injury prevalence because of the contact-based nature of the sport, basketball is a little different because most forms of physical contact are frowned upon and penalized. In a majority of the surveys on injury prevalence, basketball has been shown near the top of the list, including populations of young adult recreational athletes (Conn, Annest, and Gilchrist, 2003; Dane, Can, Gursoy, & Ezirmik, 2004), high school recreational and competitive athletes (Emery, Meeuwisse, & McAllister, 2006; Powell & Barber-Foss, 1999), NCAA athletes (Agel et al, 2007), and professional athletes (Deitch et al, 2006). The consistent finding that football and basketball are often near the top of the list of risky sports is also interesting because athletes tend to view these as the sports involving the most injury risk (Albert, 1999; Gard & Meyenn, 2000). In essence, athletes understand the risky situations in which they participate, yet they choose to continue participation in the face of danger. The risk is of varying degrees, however, seeing that there are many injuries that can happen, although specific injuries are more likely to happen than others.

**Incidence Based on Injury Type.** Another characteristic of injury that researchers have investigated numerous times is injury type. In basketball as well as most other sports (excluding wrestling, baseball, and softball), injuries to the lower extremities happen more than to any other area of the body (Powell & Barber-Foss, 1999). Hammig, Yang, and Bensema (2007) found that sprains and strains to the lower leg and ankle region represented the majority of recreational basketball-related injuries that required a trip to the hospital or doctor’s office annually in the U.S. More specifically, in women’s college basketball (Agel et al., 2007), the WNBA, and the NBA (Deitch, et al., 2006), injuries to the lower extremities including mostly strains, sprains, and
pulls, accounted for 60-65% of all injuries in those leagues. In a sample of recreational athletes within the U.S., sprains and strains accounted for 31% of all injuries, with basketball being the highest source of injury (Conn et al., 2003). This was also the case for young adult recreational athletes (Dane et al., 2004), and these statistics are not surprising because the lower extremities are the most consistently used body parts during sport participation, meaning a higher statistical probability of them getting injured, even if the injuries are simply a result of overuse. Basketball was also found to be the sport with the highest rate of minor injuries than any other sport (Powell & Barber-Foss, 1999). Thus, basketball players would seem more likely than athletes in other sports to play through injury simply due to the low severity factor (this topic will be discussed later). Aside from injury type, age is another factor that has been researched in terms of incidence comparisons.

**Age-related Injury Differences.** Aside from being sport- and type- specific, injury statistics have been found to differ in regards to age as well. The literature shows that although all ages, including children, adolescents, and adults experience a risk of injury, older athletes have a higher reported injury rate than younger athletes. For example, Le Gall, Carling, Reilly, Vandewalle, Church, and Rochcongar, (2006) found that pre-pubertal children do not have as high of a risk of injury as post-pubertal children and adults, although the athletes in each age group ranging from youth to adolescent experience at least some risk of injury. Adickes and Stuart (2004) illustrated that fourth grade athletes had almost a three percent chance of getting hurt during sport participation, while the figure was 11% for eighth graders, and has been found to be even higher for older populations. Although injuries to youth athletes present a problem, higher risk and prevalence has been linked to athletes who are post-pubertal throughout the literature. In essence, injury data are more readily available for college-aged and adult athletes, and the numbers presented illustrate a higher injury prevalence for the older athletes (Agel et. al, 2007; Deitch et. al, 2006; Emery et al., 2006; Le Gall, et al., 2006; Pray and Pray, 2004). This could be because older athletes typically play at higher competitive levels, at a faster pace, and have a higher risk for overuse injury or re-injury because they sometimes play the sport excessively. In summary, although injury rates in sport contexts are generally high, it is also evident that injury rates vary as a function of sport type, injury type, age, and another factor that will be discussed later, gender.
One problem with the presented data is that it could be underreported based on how past researchers defined injury. The typical definitions of injury in past research have involved injuries that needed medical treatment (Hawkins & Fuller, 1998; Roderick & Waddington, 2000) or resulted in the athlete sitting out for a designated period of time (Adickes & Stuart, 2004; Hawkins & Fuller, 1998; Nixon, 1996a; Roderick & Waddington, 2000). Both of these definitions imply that the injury needed to be reported, which ignores those injuries that are not reported. Specifically in a study based on the observation of recreational basketball players, McKay, Goldie, Payne, and Oakes (2001) found that 56.8% of those who suffered ankle injuries did not seek any form of medical treatment, meaning that over half of the injured athletes in this sample would not have been classified as being injured in many other studies. The addition of these injuries into the data could paint a worse picture in terms of the risks of sport. The picture that the presented data paints, however, is one that shows athletes, especially older ones (mainly post- as opposed to pre-pubertal), experiencing a risk of injury, and they tend to choose sports that have knowingly more risk for injury.

Why Athletes Choose High Injury Rate Sports

Once the problem of injury prevalence is established, it is necessary to examine why athletes choose risky sports for participation. One idea that is consistent throughout the literature is that the sport culture warrants minimizing the significance of injuries and dealing with them, and that the athletic norm involves showing a pain tolerance and playing through injury. Ideas behind the sport culture will be discussed in the following section.

The ‘Sport Culture’ and Injury. Howe (2001) illustrates this notion through interviews with rugby players, finding that injuries happen so often in the sport that the athletes get used to them and they become insignificant in their minds. In another study involving interviews, Albert (1999) found that cyclists experience some of the highest injury rates out of any other sport and are well aware of the risks, but they describe injuries and potential dangers as necessary risks and characteristics of the cycling culture. In essence, if somebody wants to be involved in the sport of cycling, they have to accept the possibility of injury as part of their lives. Acceptance and minimization of pain and injury was also present in the attitudes of female rowers in a study conducted by Pike and Maguire (2003), who found that the rowers toughed it out through pain in order to save face in front of teammates and significant others in the audience. Roderick and Waddington (2000) described this tendency from interviews with professional soccer players as
well, finding that not only are the players willing to play through their injuries and perceive them as insignificant, but they feel no fear of injury risk as well. The idea of injury is not only normalized within the sport culture, but also among media outlets that tend to valorize stories about playing through injury and being tough, as well as explaining playing through injury in terms of loving one’s sport more and being more closely linked to the sport culture (Nixon, 1993). So not only do athletes experience internal and team factors that lead them toward seeing injury as inconsequential, but the popular media sends similar messages, telling athletes that if they do not accept injury they do not love their sport or are not a part of the sport culture, which is a notion strongly present within the sport ethic, which will be addressed in the next section.

**Sport Ethic.** The “sport culture” has been associated in the literature with the “sport ethic” (Hughes & Coakley, 1991; Nixon, 1996b), which is associated with the idea that participating in one’s sport is a priority that should be seen above all else. According to Hughes & Coakley (1991), those who adopt the expectations of the sport ethic must do anything it takes to continue participation in their sport as well as succeed, which includes playing through injury. The participation through injury behavior is also accepted by many of those within the sport culture because it is seen as a form of dedication and courage, which are qualities associated with the best and most elite of athletes. Those who adopt the sport ethic are not only expected to accept and play through injury, but they realize they must do so without showing any negative effects of the injury. Injured athletes with this attitude must act like they are completely unaffected and appear as though they are not hurt at all (Hughes & Coakley, 1991). Within the sport culture that often influences athletes to adopt the sport ethic, some athletes choose to internalize these characteristics, identifying themselves as athletes rather than simply engaging in the behaviors expected of them as athletes. These athletes have experienced a transition in which being an athlete and adopting these attitudes becomes how an athlete defines the self.

In a qualitative study conducted by Shaffer (1997), this sport ethic was referred to when analyzing responses of high school wrestlers as to why they decided to participate despite pain and injury. Over half of the answers given by the participants involved reaching goals and being successful, meaning that playing through injury was a consequence they were willing to deal with to be able to accomplish their goals. In essence, these wrestlers were expressing the attitude conveyed by Hughes and Coakley (1991) that they feel they must do “anything it takes” to continue participation in their sport and strive for success. These wrestlers also mentioned how
important the sport of wrestling was to them as a reason for participation through injury, and other members of their sportsnets (discussed in the proceeding paragraphs) would typically express an understanding of that attitude.

‘Sportsnets’ A final sociological notion that has been associated with sport cultures and being an athlete is known as a “sportsnet.” According to Nixon (1992), a sportsnet includes all of an athlete’s significant others within their sport culture, and almost all of an athlete’s sport-related interactions are within these nets. Although athletes within these nets tend to feel supported and in control, their thoughts, feelings, and behaviors are influenced more by these social interactions than they realize. As noted, athletes within sport cultures often decide to play through injury for a variety of reasons, and the significant others within their sportsnets are likely to adopt similar behaviors and values related to injuries. The people with whom athletes associate with most of the time are supporting and often mimicking their behaviors which condones behaviors such as playing through injury.

Furthermore, since these athletes may have little contact with the outside world in terms of conversing about sports, their views are rarely questioned by outsiders who may adopt different perspectives. When an athlete does decide to talk to significant others outside of their sportsnets about injury, for example, they often perceive that the outsiders simply do not understand and refer back to those within their nets, who understand and can relate to the topic. To simplify this explanation, an athlete who is injured is being socialized by athlete-friends to play through the injury and when they engage in this behavior it is often encouraged, reinforced, and duplicated by those around them. With this process in place along with the notion that the opinions of “outsiders” (who are most likely to challenge thoughts, feelings, and behaviors associated with the sport ethic) are ignored, athletes are likely to continue participation through injury because it was the right decision, or only choice, in their perspectives (Nixon, 1992).

Another element that may factor into such decisions is the level at which an athlete participates, or whether they are at the elite or non-elite level of sport.

In sum, athletes choose risky sports for a variety of reasons. First, being active within the sport culture often influences people to look at injury as insignificant, find it a necessary part of sport participation, and continue participation in the fact of risk to save face in front of other members of the sport culture as well as significant others. Second, within these sport cultures, the sport ethic is an attitude that leads athletes to do anything it takes to continue participation in
their sport, which is supposed to be the most important component in their lives. Thus, if the sport ethic is adopted, athletes will likely choose to participate despite risk of injury, and when hurt they will often feel like they should not acknowledge pain. Finally, members sportsnets, or significant others within the sport culture, not only encourage other athletes to participate with and accept pain and injury, but they engage in those behaviors themselves. If an athlete is strongly associated with their sportsnet, participating through risk and pain may be all they know, and the only decision they see as acceptable.

*Elite vs. Non-elite Athletes*

Another group that is often thought to not adopt the sport or “masculine” identity toward pain and injury are non-elite athletes. A majority of research in the world of sports is conducted with elite athletes (Hawkins & Fuller, 1998; Howe, 2001; Nixon, 1993; Roderick & Waddington, 2000; Young & White, 1995), who are often seen as more likely to play through pain because they have higher expectations to succeed and adopt a strong athletic identity. Furthermore, many elite athletes are paid to play their sport, or will be paid in the future, so the direct benefits they receive from playing their sport may influence them to take more risks involving pain.

However, non-elite athletes have been shown on occasion to be just as likely to play through injury as the elite, although this finding was specific to high-risk sports such as rugby. According to Liston et al. (2006), non-elite rugby players answered injury-related questions in a similar fashion to how literature portrays elite athletes, saying that they would feel embarrassed if they did not play through injury, pain is insignificant to them, and many of them would not admit being injured unless they physically could not play the sport. Some other studies conducted on children have shown similar attitudes of the athletes, and most of the youth in these studies do not play on the elite level (Gard & Meyenn, 2000; Malcom, 2006). The idea of playing through injury seems to be an important topic considering a seeming majority of athletes engage in such behaviors. In fact, in one study it was found that despite variables such as gender, age, and level of competition, 94% of all athletes surveyed claimed that they had played through an injury at some point (Nixon, 1996b). Revisiting the notion that most of the injury research has been done with elite athletes, further research should be conducted with recreational athletes.
Socialization and Playing with Injury

Many athletes are socialized into their sports by the people around them, and this socialization process often affects athletes’ attitudes toward injury. The following section describes who socializes athletes, as well as how these athletes are socialized in regards to attitudes toward injury.

Sources of Socialization. There are a variety of ways that athletes can be socialized to adopt the sport culture that warrants playing through injury. In general terms, if an athlete portrays a strong dedication toward their sport in the face of pain, they are more likely to be accepted into their sport by coaches (Curry, 1993; Malcom, 2006; Nixon, 1992; Nixon, 1994a; Roderick & Waddington, 2000), teammates (Malcom, 2006; Nixon, 1992; Nixon, 1994b), experts (Albert, 1999), trainers (Nixon, 1992), and the media (Nixon, 1993). More specifically in regards to coaches, they have been found to claim that athletes who play through injury deserve more respect, they have to accept risk to be successful, and they cannot worry about pain and injury (Nixon, 1994a). These thoughts are likely to influence the behaviors of the coaches who are possibly the most crucial socializing agents in the lives of athletes, although they are not the only important sources of socialization in the lives of athletes.

Media. All the previously identified sources of acceptance toward the athlete are some of the same sources of socialization that lead to the heightened importance of sport in the lives of athletes. For example, many media outlets write stories to aggrandize athletes who play through injury, portraying an image of those athletes being heroes, being successful, and being true athletes and role models (Nixon, 1993). Other athletes who participate in similar sports read these articles and get the message. That is, they are likely to copy the role models and duplicate the actions that got the successful athletes to the level they achieved. The previously mentioned Allen Iverson and Dwyane Wade commercials are detailed examples of the media portraying the willingness to play sport through pain being associated with star status and high ability levels, which may be internalized and modeled by athlete viewers. As the media is a source of socialization relatively external to the lives of athletes, there are socializing agents, such as experts, coaches, teammates, and trainers, who play a more direct, or internal, role.

Experts. Furthermore, experts in a sport can socialize younger or beginner athletes to be part of the culture relevant to their sport (Albert, 1999; Donnelly & Young, 1988). This was shown in a participant observation conducted by Donnelly and Young (1988), who found that
beginner rock climbers and rugby players were easily distinguished from the experts in the sport, but when they participated for awhile and surrounded themselves with those who knew about their subculture, it would not take too long for the beginners to be indistinguishable from the experts. This occurrence took place involving types of language used within the sport subculture, types of equipment that were best for optimal performance and comfort, and even what the athletes in the specific sport tend to do in their spare time (Donnelly & Young, 1988).

More specific to injury and risk, Albert (1999) also utilized participant observation methodologies to examine cyclists, who, as previously discussed, have been documented to experience one of the highest injury risks in any sport. Results indicated that cyclists are very aware of the risks they will encounter, and they undertake certain precautions to minimize danger in risky situations. The novice riders in the study were not aware of these procedures until they rode with the experts multiple times, so until then, they would experience higher risk and place the riders around them in higher risk as well (Albert, 1999). Experts provide another source of socialization for athletes who look up to them and need to learn about important aspects of a sport’s culture, such as playing through injury and tolerating pain. Another group of people directly involved in the lives of athletes are coaches, teammates, and trainers; whether or not they can play the “expert” role within their sports, they are still extensively influential in the attitudes and decisions of the athletes with which they socialize.

Coaches, teammates, and trainers. A third source of socialization for athletes forming a willingness to accept risk and pain in their sport involves those directly within the sport, such as coaches, teammates, and athletic trainers. Nixon (1994b) interviewed 156 division one college athletes about injury attitudes, and found that significant others within the sport, such as teammates, coaches, and athletic trainers, are people that athletes turn to for support when they are injured. At the same time, half of the subjects mentioned that although they were never discouraged to play through injury, they felt pressure from the significant others around them to continue playing or get back as soon as possible, and they felt the necessity to avoid coaches and trainers while they were hurt so they did not have to report the injury and receive negative feedback (Nixon, 1994b). In essence, the people with whom athletes tend to surround themselves for socialization purposes are the same people that condone playing through injury and produce pressure for injured athletes to come back possibly before they are physically ready to return.
In one study in which athletes felt they should not continue participation based on self-assessments, they were still directly asked by their coaches to keep playing or return early after injury (Thompson, 1992). Conversely, these same coaches expressed that they care for the athletes’ well-being, which is an attitude that does not coincide with their behavior. In regards to athletic trainers, they reported that injury is a necessary risk of sport participation, playing through pain is a sign of dedication and is a more favorable act than sitting out. Ultimately most of the trainers said they would play through injury given the same circumstances many athletes face (Walk, 1997). These attitudes expressed by the coaches and trainers of athletes may not be directly expressed to the athletes, but they are likely to influence the behaviors of the coaches and trainers which could lead to a form of indirect socialization. In Roderick’s (1998) view, just being in the same sport as others who adopt the playing through injury attitude, although indirect, could be as important of a source of socialization as direct behaviors and comments. So even when the intention of the socializing agents is not manifest, athletes can still be influenced to play through injury. It has been established who might influence the attitudes and decisions of athletes, especially in terms of accepting risk and pain, but it is also necessary to determine how this socialization process occurs for athletes.

The Socialization Process

In terms of socialization of athletes into the sport culture, some of the literature went into great detail about the process along with the sources of socialization previously addressed. In Malcom’s (2006) participant observation of youth softball players, it was noted that many of the girls originally expressed pain often and were timid in the face of risk when they had not yet been participants for a long period of time. However, throughout the course of the observed season, the perceptions of the players began to change because of behaviors of coaches and umpires in the league. The adults would make pain seem insignificant by ignoring players who expressed pain, sometimes mocking the idea of pain, describing pain as a positive experience, or directly telling their players to deal with pain (Malcom, 2006). Furthermore, when the coaches and umpires of the league were, for example, hit with a ball or bat, they would not express any type of pain to those around them. The athletes would eventually mimic these behaviors, mocking and ignoring pain, and even telling previous pain stories with pride and joy (Malcom, 2006).
In a similar study involving the socialization of pain reactions with a wrestler, Curry (1993) described a similar process in which the athlete was more likely to ignore and tolerate pain with more experience in the sport. This particular athlete exhibited a high pain tolerance and a high pain threshold from a young age because his father minimized pain and told him to play through injury. When he began wrestling, he had a coach who was in a wheelchair but still did whatever he physically could and told his wrestlers to never give up; also, his father was still by his side while he wrestled (Curry, 1993). These influences led the athlete to wrestle through minor as well as serious injuries such as cauliflower ear and a knee injury. He ended up having a successful high school and major college wrestling career, in his opinion, as a result of working through the adversity. He came to learn through the socialization process with his father, coach, and other wrestlers, that injury is a huge part of the sport of wrestling, and as long as it does not physically debilitate an athlete it is insignificant (Curry, 1993).

The socializing agents (i.e. parents, coaches, umpires) who have been found to be the most influential in the lives of athletes seem to be in positions of authority, which are likely to be figures athletes will model and obey due to the status differences. In fact, team owners seem to hold one of the highest positions of authority in sports, and in one study owners reported they experienced high risk when athletes were injured because it may negatively affect success opportunities. As a result, many of them would threaten the injured athletes to come back early, transferring the risk to them (Nixon, 1992).

In a general sense, athletes from all groups and with all characteristics seem to be socialized to play through injury and have a high tolerance for pain. This is because those who surround athletes during their sport participation teach them to adopt these attitudes directly or indirectly through their own actions. Furthermore, not only are athletes socialized to play through injury during early sport participation, but this is a continuous process that occurs throughout most, if not all, of their sport careers (Roderick, 1998), making the adopted attitudes and behaviors stronger over time. Another important part of this socialization process is how socializing agents in the lives of athletes react to their decisions to play or not to play through pain and injury, which might have an influence on athletes’ future decisions.

In summary, athletes are socialized within their sports towards having certain attitudes and engaging in specific behaviors, including making choices to play through injury and pain. Some of the people who play major roles in this socialization process in various ways are the
media, experts, those in positions of power, coaches, teammates, and trainers, among many potential others. These groups have been shown to socialize athletes to engage in certain behaviors and have specific attitudes, including directly pressuring athletes to participate through injury, modeling the behaviors themselves, reacting to playing through injury positively, and reacting toward not playing through injury negatively. The socialization process is important because athletes do not typically come into sports with behaviors consistent with playing through injury, but eventually these behaviors and attitudes manifest themselves. Not only is it then obvious that athletes are socialized to accept risk and pain, but this is a continuing process as long as sport participation resumes.

Acceptance of Playing with Injury

Since people in certain sport cultures are typically the socializing agents for other athletes in the same sports, it seems evident that if the new athletes adopt the attitudes given to them they will be more accepted than those who behave outside of the norms set by the cultures. Conversely, if they do not do what is expected of them as an athlete they may not be accepted into the subculture associated with their sport, and those around them would behave accordingly. This idea seems consistent with the notion that those who internalize expectations of high pain tolerance and normalizing of injury and act accordingly are perceived more favorably by others. Those who do not display these characteristics experience a variety of consequences.

Acceptance-related Choices. Gard and Meyenn (2000) found that boys are more likely to choose to participate in contact than non-contact sports, and they feel they must deal with the risks without complaint so they can look good in the eyes of their peers. Furthermore, overcoming risk is perceived by boys as an important ingredient to becoming a successful athlete. Similarly, Curry (1993) found that a wrestler associated playing through pain and injury with athletic success and excellence from when he was young because his coaches and father told him so. Also, his father accepted him as an athlete more when he chose to tough out an injury, and his coach paid more attention to him when he did as well (Curry, 1993). Roderick and Waddington (2000) found similar results for professional soccer players in Europe. Specifically, when they show a positive attitude toward being injured, they are more liked by the medical staff as well as the team coaches.

Howe (2001) discovered similar tendencies, because the rugby players that he interviewed said they were more likely to only talk about pain and injury when they were able to
play through it. This meant that others would know they were hurt and see them playing, which would lead the observers to interpret their toughness as favorable. This is an example of self-handicapping, which is a strategy used to protect or enhance one’s self-esteem in the face of evaluation from others (Kimble, Kimble, & Croy, 1998). In the example provided by Howe, the athletes showed self-handicapping tendencies by voicing the pain so if they performed well they would be seen as exceptionally tough, whereas if they did not perform well they had a reason (pain/injury) as to why that was the case. This self-handicapping tendency has been reported as a fairly consistent trend, especially in sports, and has been shown in males and females as early as in third grade (Kimble, et al., 1998). This strategy of playing through voiced pain is important, seeing that those who do not play through injury feel bad about their decisions and may experience consequences from others. In a sample of female rowers, it was found that if they did not participate through pain and injury, they saw it as socially inappropriate, as if they would not be accepted by others (Pike & Maguire, 2003). Additionally, the players would only voice the pain if they could play because if they did not perform well they had an excuse (Howe, 2001), meaning others would still see them as athletically successful simply because poor performance was injury-based (self-handicapping).

In a general sense, a major reason that athletes decide to play through injury is because this behavior has been shown to be constantly justified by those within the sport culture, such as administrators/owners, coaches, and even the media (Nixon, 1998). Athletes have been shown to associate playing while hurt with being rewarded, having a higher character than those who do not, and “separating the men from the boys” (Young, White, & McTeer, 1994). This brings forth the idea of masculinity being a desired trait for many athletes, including both males and females. More specifically to females, Young (1997) found that many female athletes perceive the idea of playing through pain as a source of identity, empowerment, and increased self-esteem, showing that this behavior has revealed benefits in the perceptions of many athletes. Conversely, showing behaviors consistent with not playing through injury or faking it have shown a variety of negative consequences for the athlete decision-makers.

**Rejection-related Choices.** Conversely, those who do not play through injury are seen in a negative light by those around them, and may experience certain consequences such as losing their role on the team if they have to sit out because of injury (Howe, 2001). As long as they are still playing the coaches would probably not replace them as a starter. Another coach behavior
associated with not playing through injury involves direct punishments given to the target athlete. Roderick and Waddington (2000) addressed this issue, finding that when professional soccer players in England were known to be hurt and decided not to play, the coaches were more likely to give them negative feedback, make them stay extra hours after practice to do drills, take away their role on the team, and make them show up to team gatherings earlier than the other teammates, with threats of more punishment if they do not fulfill these expectations. The consequences faced by athletes who do not play because of injury could also come internally. According to Thomas and Rintala (1989), if athletes cannot play their sport due to injury, they could lose their identity as an athlete, as well as feel alienated from their world and the people around them.

Regarding identity, Young et al. (1994) illustrated that many male athletes who are injured and unable to continue performance perceive themselves as “less of a man” than if they were able to play through being hurt. Many athletes who cannot play their sport also lose meaning in their lives, and they can feel as though they no longer have control over their situation, both of which can lead to more negative outcomes (Thomas & Rintala, 1989). In a sample of female rowers, Pike & Maguire (2003) found that some of them were afraid that if they showed injury, they would be perceived as faking it or trying to get out of training by those around them. It was also found within this sample that if they did not participate through pain and injury, they saw it as socially inappropriate, as if they would not be accepted by others if they engaged in such a behavior (Pike & Maguire, 2003). The actions of the young females in Young’s (1997) study gave behavior support for the social inappropriateness, as they were disrespected and made fun of, having their identity and dedication questioned if they did not minimize pain. That is, athletes who do not or cannot tough it out through injuries not only have to deal with consequences coming from the people around them who may be disappointed by their decision, but they may also have to deal with internal consequences, which can be just as, if not more devastating.

It seems as though athletes make some of the decisions they make, including decisions about playing through injury, strongly based on internal as well as social benefits or consequences that come along with each decision. For athletes who decide to play through injury, they tend to feel better about themselves and get positive feedback from those around them. Conversely, for those who decide not to play through injury, they may feel badly about
themselves, get negative feedback from coaches, teammates, trainers, and the media, and also lose their role or position on the team. When each injury case occurs, it seems as though athletes must weigh the pros and cons of their potential decisions, and decide accordingly. Although the socialization process has been established as an influential factor in the decisions athletes make in regards to playing through injury, there are other possibilities that may factor into these decisions as well, some of which will now be discussed.

**Other Reasons Athletes May Play Through Injury**

Aside from social reasons for playing through injury, there are a number of other possible reasons that athletes decide to play through injury. First, playing a specific sport (i.e. contact) at a specific level (i.e. elite) often warrants playing through injury because of the potential direct consequences of not doing so (Egan, 1987; Paparizos, Tripp, Sullivan, & Rubenstein, 2005). For example, many athletes at the collegiate level engage in these behaviors for fear of losing their scholarship because they could not perform. Also, for some of the athletes in lower socioeconomic status categories, they see success in sports as the only means of upward mobility, and if they cannot play because of injury they will not improve their lives (Hughes & Coakley, 1991). Other consequences of being injured depend on the timing of the injury during the season. For example, some athletes will attempt to play through injury during the preseason if they feel the need to prove their ability to their coaches and teammates. Some will play through injury during the end of the season or during the post-season because those games mean more, and athletes in their final years of competition realize they do not have much time left (Gayman & Crossman, 2003).

Second, athletes have been shown to play through injury because of pressure from their parents to be tough and succeed (Curry, 1993). Third, some physiological factors can be associated with athletes playing through injury such as higher pain thresholds due to slow pain pathways, weak pain receptors, taking drugs (i.e. pain medications), or simply being active, which has been linked to higher pain thresholds when compared to sedentary people (Pike & Maguire, 2003; Wiese-Bjornstal, 2002). Finally, certain psychological factors have been associated with playing through pain such as having a high love for the sport, being intrinsically motivated to participate in the sport (Walk, 1997), using cognitive strategies such as seeing pain as a positive thing (Kress & Statler, 2007), and having experienced psychological skills training (Whitmarsh & Alderman, 1993), including mental imagery (Driediger, Hall, & Callow, 2006).
Thus, socialization processes are not the only potential sources of deciding to play through injury, although they are the most consistent and most researched. Two topics that have been discussed in terms of the socialization process toward playing through injury, but have yet to be quantitatively researched are gender and athletic identity. However, in a qualitative light these two ideas have been intensely studied with regards to playing through injury.

**Gender and Athletic Identity**

There has been much research conducted linking gender and injury in sports, from injury rates to the socialization process of accepting and minimizing pain and injury. This section is aimed toward discussing the similarities and differences found between male and female athletes in terms of injury, as there does not seem to be a definitive agreement linking these two variables. The first topic that relates to how males and females may differ pertains to incidence of injury.

**Gender injury data.** Most of the incidence data of injury presented earlier included mainly male participants, but rates of injury for female athletes has been researched as well, and compared with the data on males. Injury has been found to be a larger problem for males than females in the literature, as the male rates of injury are typically much higher than those of female athletes. For example, in their U.S. sample of sport and recreational athletes, Conn et al. (2003) found that males were more than twice as likely to report injuries as females. Similarly, in their study examining recreational basketball injuries in the United States, Hammig et al. (2007) found that males were over seven times more likely to report a basketball-related injury to a hospital or doctor’s office than females. These rates could mean males experienced more injuries within these samples, or males are more likely to report injuries to a doctor or hospital. Either way, injury seems to pose a larger problem for male than female athletes within the given data. Despite the differences in injury incidence rates that have been discovered between male and female populations, there is some evidence that these groups may portray similar attitudes toward the injuries they suffer.

**Injury attitude similarities.** Much of the identity research presented in relation to athletes’ attitudes toward injuries has described these attitudes toward injury in terms of a “masculine” identity (Curry, 1993; Gard & Meyenn, 2000; Liston, Reacher, Smith, & Waddington, 2006; Malcom, 2006; Young, 1997). However, more research has been done in recent years to show that this identity is not specific to males or masculine ways of thinking,
because female athletes adopt similar values involving the minimizing of injury significance (Malcom, 2006; Pike & Maguire, 2003; Young, 1997; Young & White, 1995), although they may not internalize this identity to the same degree as males.

Malcom (2006) conducted a study with participant observation of a girls’ softball team in hopes of discovering if females are likely to play through injury and when this socialization occurs. Results indicated that although the girls may not have gone into the sport with intentions of playing through pain, it did not take long before they were minimizing injury, making fun of others who showed their pain, and playing after occurrences that were later described as painful (Malcom, 2006). Similarly, Young and White (1995) and Young (1997) interviewed adult females who played in sports perceived as masculine in nature, and found that they were just as likely as males to minimize injury, mock others who were hurt, and show bravery in the face of risk, regardless of degree. Furthermore, many of the interviewed females described a closing of the gap between females and males in terms of pain and injury perception, some saying that females did not, in fact, differ from males.

Pike and Maguire (2003) conducted a qualitative study with female rowers to determine how they react to pain and injury, and how it fits with expectations. Specifically, two-thirds of the 200 female respondents said it is necessary to take risks and minimize pain within the sport of rowing, which is not typically seen as a risky or dangerous sport to the degree of football, basketball, and wrestling. These participants seemed to be showing similar injury reactions as male athletes, but they saw it in terms of wanting to be successful in their sport rather than presenting “masculine” characteristics (Pike & Maguire, 2003). In essence, these female recreational athletes typically minimized pain and injury despite the outside pressures and expectations not necessarily being present, and these injury reactions presented similarly to documented male reactions to injury (Pike & Maguire, 2003). Along with the similarities that are evident among male and female athletes in terms of attitudes toward injury, there are also similarities between these two groups in regards to the socialization process that may influence said attitudes.

Socialization process and gender. Another topic that seems to hint toward more of a similarity than difference between each gender in terms of injury attitudes involves the socialization process experienced by female athletes. In particular, Young (1997) interviewed female athletes participating in sports seen as masculine, finding that one major reason that
females athlete attitudes are similar to those of males in similar sports is because many of these athletes played with the males in their schools or with their brothers when they were younger. This leads to similar thought processes and reactions related to injury, pain, and “being tough.” Furthermore, these young athletes are often influenced by their fathers and brothers to participate in sports and adopt these attitudes (Young, 1997; Young, White, & McTeer, 1994). In essence, males and females can often be socialized together, by the same family members, and by the same classmates, which may lead to similar attitudes toward injury and pain acceptance. On the other hand, much of the socialization process is experienced on specific sports teams, which often separate the genders as well as the processes of socialization between males and females. When the genders are socialized separately, some attitude differences may arise between males and females toward injury.

*Injury attitude differences.* A source of differences between males and females in terms of reaction to pain and injury presented in the literature involves pain tolerance. In a study conducted by Karchnick & Buxton (1997), female and male participants underwent a Cold Pressor Test, meaning they submerged a hand in near-freezing water, mentioning when they felt pain, and taking their hand out when they felt too much pain to continue (tolerance). The results showed that males had a significantly higher pain tolerance than females. A second variable assessed by Karchnick & Buxton was fear of pain, with females reporting a significantly higher fear of pain than males (1997).

Another gender difference with regards to injury involves the degree to which males and females adopt the minimization and acceptance of risk and pain. Even though the literature revealed that females adopt similar attitudes to males in that realm, it is still evident that they may not experience these feelings to the same degree as males in the sport (Gard & Meyenn, 2000; Nixon, 1996a). Nixon (1996a) illustrated this through interviews of college athletes, finding that there was no difference between how much males and females get injured, but males are more likely to tolerate pain and play through injuries than the females. It seems as though males tend to have a higher pain tolerance and lower fear of injury than females, although females still have expressed a willingness to participate in sport in the face of pain and injury. The differences between genders in this regard might come down to the *degree* to which either sex is willing to adopt pain and injury accepting attitudes and behaviors, but even that conclusion is not definitive. Whether there are similarities or differences between each gender and how they
react to pain and injury, both groups go through a specific process of socialization as a means toward the decisions they make. Most of the literature on this topic has involved male athletes, but more recently females have been brought into the picture as well, so now the experiences of the two groups can be compared.

In summary, it seems as though males and females have shown similarities in their socialization processes toward being tough and minimizing pain in sports, and these similar social processes may have led both groups to be more likely to play through injury. However, differences arise in studies looking at injury prevalence between genders, finding that male recreational athletes report many more injuries each year. The second difference shown in the literature is that although males and females are self-reported as likely to normalize injury, males may be likely to do so to a higher degree than females, and maybe more often. It is not definitive whether injury attitudes of males and females or their likelihood to participate with injury are more similar or different. Further research is necessary to provide answers to this debate.

**Athletic Identity and Injury.** Along with gender, a factor most central to the present study’s focus on playing through injury is athletic identity. According to Hin Yue Li and Anderson (2008), athletic identity is “the degree to which individuals identify with the athlete role” (p. 177). It seems evident, then, that athletic identity is also the degree to which athletes adopt the attitudes socialized within sport cultures, sportnets, and is associated with a strong adoption of the sport ethic. Athletes with a strong athletic identity associate playing through and minimizing injury, representing a culture that makes injury insignificant. Sports Illustrated Magazine is one popular media source that describes playing through injury as a result of loving one’s sport and having an identity associated with those feelings (Nixon, 1993).

Another study that illustrated the importance of an athletic identity related to injury experiences was conducted by Gard and Meyenn (2000), who conducted interviews with boys to find out what movements and activities they preferred, but found that they talked about injury so much that the researchers shifted their purposes. When they began to ask about how the boys looked at injury, it was discovered that they wanted to show a masculine identity to others, so they chose sports that presented higher risks and more contact so they could internalize this identity. Masculinity has also been found to be a desired identity for some females who want to succeed in sports, because it is seen as a sign of respect when associated with athletes (Young, 1997). Furthermore, Young illustrated that this masculine identity is associated with playing
sports because many of the females within the sport culture who have adopted an athletic identity have questioned their own femininity. Thus, the factors that seem to be associated with being an athlete, were playing through injury, and being tough and masculine, and within the sport culture many athletes desire to portray these characteristics.

Further illustrating the influence of athletic identity on the thoughts and behaviors of athletes, during interviews with professional soccer players, Roderick and Waddington (2000) found that some of the reasons the athletes would play through injuries were for fear of losing their role, frustrations with not being able to play, and desire to play in more important games, all of which the authors associated with a strong athletic identity. A more direct investigation about the notion of identity came from Thomas and Rintala (1989), who determined that athletes who cannot play their sport may lose a sense of who they are, and they may feel like they are alienated from their world. According to these findings, an athlete who cannot play due to injury may not see themselves as an athlete, henceforth losing their athletic identity. In fact, many athletes have been found to outright deny any negative long-term consequences of injury or playing through it. For example, in one study athletes reported that they felt so strongly against negative consequences of playing through injury that they were willing to sign a waiver taking full responsibility for their actions and potential consequences (Walk, 1997). That is, it is so important for some athletes to be able to play through injury and adopt the athletic identity that consequences are meaningless compared to the benefits of participating in their sport.

Based on the literature it seems evident the power of influence a strong athletic identity can have on an individual’s decisions. What is not obvious, though, is how it might affect decisions specific to playing through injury. Qualitative evidence has illustrated that maybe those with stronger athletic identities would tend to play through pain and injury and portray an attitude of toughness, but these links have not yet been established through quantitative analysis.

Summary

The literature has established some tendencies involving the relationship between athletes and injuries in sports. First, a lot of injuries occur each year, more in the sports involving contact than those that do not. Second, basketball and football are the major sports with the highest injury rates. Third, the culture of sport, mainly in America, minimizes and normalizes injury during sport participation, which influences the athletes involved to want to participate despite pain and injury, or else they may lose their identity as an athlete. Fourth, most individuals who
play through injury and minimize the idea of injury do not possess those traits immediately; rather, these beliefs are often developed through a socialization process with teammates, parents, coaches, and medical staffs, among other socializing agents. Fifth, those who tough it out through pain are generally seen as more acceptable in the eyes of coaches, teammates, parents, and trainers, and those who do not are viewed in a negative light and experience negative consequences because of their choice not to play. Furthermore, the athletes themselves feel more positive about their own attitudes and behaviors when they play through injury as opposed to sitting out. Finally, there are two major factors related to social processes in sport that may or may not have an influence on athletes’ decisions to play through injury: gender and athletic identity. With these ideas in mind, there are a variety of limitations present within the existing literature that will be addressed in the present study, which also play into the significance of the present topic.

**Significance.** The topic of the present study is significant for a variety of reasons. First, basketball has been presented as one of the highest risk sports in terms of injury, but no research has been conducted to determine the frequency that basketball players play through injury. Second, most research in this area has been conducted on elite athletes, whose willingness to play through injury may be expected because of the potential importance of their sport at the present and in the future (i.e. sport as livelihood). Recreational athletes do not experience these direct benefits of participating in their sport, so their attitudes toward playing through injury may differ from elite athletes. This idea is important because data has shown that recreational sport is the primary way the vast majority of adults in North America directly participate in sport (Wellner, 1997), and a large number of recreational sport injuries are reported each year (Travisano, 1994). More specifically, Travisano (1994) conveyed that recreational athletes participating in sports such as lacrosse and rugby have reported 30 injuries per 1000 hours of activity, with 5 injuries per 1000 hours being considered a high rate. Recreational basketball athletes were also near the top, reporting 14 injuries per 1000 hours of exposure. Overall, athletes in 11 recreational sports of the 17 examined within the study reported 5 or more injuries per 1000 hours of exposure to their sport, which are all considered high rates (Travisano, 1994).

Third, assessing this behavior is necessary because playing through injury has been linked to chronic pain, developmental problems in children (Conn et al., 2003; McManus, Stevenson, Elliot, Hamer, Finch, & Lower, 2002; Shaffer, 1997), and performance deficits.
(Kress & Statler, 2007), which is ironic because many see sport as a source of increased well-being. That is, they perceive that they can only be successful if they are willing to participate through inevitable injuries. Fourth, the potential for reinjury is high in athletes who play through injury, which is illustrated by the findings of Emery, Meeuwisse, & McAllister (2006). They noted that 49% of all injuries in a particular population of high school athletes were associated with previous injuries. Specific to ankle injuries which are the source of the majority of injuries documented in basketball, McKay et al. (2001) utilized observation of recreational basketball players and found that those with a history of ankle injury were almost five times more likely to suffer another ankle injury than those who had no history of ankle troubles. Fifth, it is necessary to compare male and female attitudes toward playing through injury to determine whether these attitudes and behaviors are a “masculine” characteristic, individual decision, or result of simply playing sports and the accompanying socialization process, regardless of gender. Finally, athletic identity is a concept that has been conceptually linked to the playing through injury decision process, but there is no data available to confirm the conceptual link.

**Purposes.** There were two specific study purposes and corresponding hypotheses. The first purpose was to determine male and female recreational basketball players’ perceptions of playing through injury, including (a) how important they perceive being tough is in the face of injury, (b) how strongly they see playing through injury as being necessary for an athlete role, and (c) how much significant others within their sport influence athletes to play through injury. In addition, their self-perceived behaviors regarding actually playing through injury were assessed. The hypotheses associated with the first purpose were that males, when compared to females, would (a) perceive being tough in the face of pain/injury as more important, (b) see playing through injury as more necessary for an athlete role, and (c) experience more influence from significant others to play through injury. It was also hypothesized that males would express a stronger self-perceived tendency to actually play through injury than females.

The second purpose was to determine high, moderate, and low athletic identity recreational basketball players’ perceptions of playing through injury, including (a) how important they perceive being tough is in the face of injury, (b) how strongly they see playing through injury as being necessary for an athlete role, and (c) how much significant others within their sport influence athletes to play through injury. In addition, their self-perceived behaviors of actually playing through injury were assessed. The hypotheses associated with the second
purpose were that recreational basketball players with a stronger compared to a weaker athletic identity would (a) perceive being tough as more important, (b) see playing through injury as more necessary for an athlete role, and (c) experience more influence from significant others to play through injury. Furthermore, recreational basketball players with stronger athletic identities would express a greater self-perceived tendency to actually play through injury than those weaker in athletic identity.
Chapter Two
Methods

Study Participants

The participants for the present study were 130 recreational basketball players (68 male, 62 female) who participated in male-only (n=48), female-only (n=43), and co-ed (n=34) intramural basketball leagues at a mid-sized University in the Midwestern United States. The participants ranged in age from 18 to 24 years, with an average age of 20.03 (SD=1.60) years. Of the 130 participants, 29 (22.3%) were freshmen in college, 35 (26.9%) were sophomores, 30 (23.1%) were juniors, 29 (22.3%) were seniors, and one (0.8%) was a graduate student, while six (4.6%) participants did not specify their academic level. In regards to highest level of basketball experience, 38.5% (n=50) of participants played basketball at the high school level, 6.1% (n=8) played for youth teams, 23.1% (n=30) did not reach higher than the recreational or intramural level, and 14.6% (n=19) claimed they never reached any level in basketball, replying with “none,” while the remaining 17.7% (n=23) participants did not provide answers to this question. Furthermore in terms of experience, participants averaged 6.64 (SD=3.98) years of experience playing basketball, 1.58 (SD=1.12) years playing intramural basketball, and 2.37 (SD=1.82) hours a week playing basketball at the time of the study. The intramural basketball athletes selected for the present study were not involved in intercollegiate basketball or any other intercollegiate sports, which placed them under the category of “recreational” athletes.

Research Design

The design for the present study was descriptive in nature and was conducted for the purpose of determining recreational basketball players’ attitudes and self-perceived behaviors toward playing through injury as a function of their gender and level of athletic identity. Study procedures involved administration of self-report questionnaires to a sample of male and female recreational basketball players.

Instrumentation

In order to assess the variables of interest for this study, a series of self-report questionnaires were used. These instruments are described in the following sections.

Demographic Questionnaire. A demographic questionnaire (see Appendix A) was used to obtain information about participants’ characteristics. Specifically, these questions assessed participants’ age, gender, intramural league, years of basketball experience, highest level of
basketball reached, and how many hours the participants play basketball each week (including intramural games). Additional individual item questions were included to assess participants’ self-perceived ability level and the number and type of injuries each participant had experienced. All questions were presented within a single demographic questionnaire, and a free response format was used.

Athletic Identity. In order to assess the strength of athletic identity of the participants, the Athletic Identity Measurement Scale (AIMS) was used for the present study. This scale consists of ten items (see Appendix B) intended to measure strength and exclusivity of a person’s identity as an athlete (Brewer, Van Raalte, & Linder, 1993). Each item is accompanied by a 7-point Likert scale, with responses ranging from strongly disagree to strongly agree. Respondents’ scores on the 10 items were summed and averaged to obtain a single mean value. Thus, participants’ total athletic identity scores on this scale can range between one and seven, with higher scores indicating those individuals who identify themselves more strongly as an athlete.

The AIMS was utilized for the present study, because according to Brewer and Cornelius (2001) it is the most widely used scale when examining identification with a sport role. Although attempts have been made to reduce the AIMS to seven items, not enough psychometric data has been accumulated to validate that version, while the ten item scale has been shown to be both valid and reliable (Hin Yue Li & Anderson, 2008). In terms of validity, Brewer, et al. (1993) found high construct validity in a university population of males and females, because results of the AIMS correlated highly with results of the Perceived Importance Profile, which was created to measure a similar construct of the importance of sport in peoples’ lives. An ANOVA was also conducted to determine the relationship between AIMS scores and self-reported level of sport involvement, because Brewer, et al. (1993) logically deduced these two constructs should be related. Results indicated that these constructs were, in fact, highly related. Convergent validity was demonstrated by a significant (moderate) correlation between the AIMS and Sport Orientation Questionnaire (.26 to .53) in three different studies involving university populations. Finally, Brewer, et al. (1993) demonstrated discriminant validity by finding only 38% of variance shared by AIMS and Self-Role Scale scores, because the AIMS measures both exclusivity and strength of identity as an athlete, while the SRS does not.

In regards to reliability, Brewer, et al. (1993) assessed internal consistency in three separate studies, finding the alpha coefficient to be between .81 (adequate) and .93 (strong).
They also found a test-retest reliability coefficient of .89 over a 14-day period, demonstrating strong test-retest reliability for the AIMS in a university population of males and females.

**Risk, Pain, and Injury Questionnaire-Rec (RPIQ-Rec).** To assess study participants’ perceptions about playing through injury, an adapted version of the Risk, Pain, and Injury Questionnaire (see Appendix C) was utilized for the present study. The original version of the RPIQ, created by Nixon (1994a; 1994b; 1996a; 1996b), consisted of 31 items, 19 of which were included in subscales identified as “tough,” “rational choice,” and “pressed.” However, Walk and Wiersma (2005) found the original questionnaire to have low construct validity. Thus, they subsequently created a newer version of the scale (shown to have higher construct validity) consisting of 13 total items. A four-point response scale is used with responses ranging from 1 (strongly disagree) to 4 (strongly agree).

The 13 items in this newer version of the RPIQ are divided into three subscales that were originally identified by Nixon (1996a). The first subscale, termed “tough,” consists of four items (items 1, 5, 9, 12) related to an athlete’s expressed toughness regarding injury in sport. A couple examples of items in this subscale are “No pain, no gain” and “Athletes should ‘tough it out’ with an injury or pain today and not worry about the effects tomorrow”. A higher score on this subscale would mean participants perceive that athletes want to express more toughness in regards to injury than a lower score. The second subscale of the newer RPIQ consists of five items (2, 4, 7, 11, 13) and was termed “identity,” intended to measure participants’ attitudes toward “the acquisition and maintenance of athletic identity, and/or items that appear to draw distinctions between average athletes and exceptional ones (Walk & Wiersma, 2005, p. 443).” For example, an item that falls under the category of athletic identity is “Only athletes understand what it is like to play with injuries and pain”, and an item that falls under the category of separating the average from the exceptional is “Athletes who endure pain and play hurt deserve our respect”. A higher score on this subscale would mean the participant identifies athletes as perceiving themselves as athletes-first, with pain and injury playing a more of a minimized role than those with lower scores. The final subscale, termed “pressed,” consists of four items (3, 6, 8, 10) related to participants’ feelings of pressure from others (i.e. coaches and fans) to play hurt (Nixon, 1996a). Two examples of this subscale are “Teammates make athletes feel guilty if they don’t want to play hurt or with pain” and “Teammates only care about other players who are healthy and able to play”. A higher score on this subscale would mean
participants perceive that athletes feel more social pressure to play hurt than those with a lower score.

In terms of validity of this inventory, Walk & Wiersma (2005) conducted analyses based on a sample of male and female varsity collegiate athletes to determine which version of the questionnaire (the original Nixon 1996a or the newer version) yielded a better fit. They found that the newer 13-item questionnaire fit the data better than the original, showing that the new questionnaire had higher construct validity. In terms of face validity, Walk & Wiersma (2005) asserted that the adapted inventory was more valid than the original as well.

The newer 13-item version of the RPIQ (Walk & Wiersma, 2005) was used for the current study. However, the wording on a few items needed to be modified to make it applicable to the current sample of recreational athletes. Specifically, the word “coaches” was used in the “pressed” subscale items of Walk and Wiersma’s (2005) version of the RPIQ. However, since recreational teams do not often have coaches, it was necessary to replace “coaches” with “teammates” for those specific items, as an equally influential sport socializing agent as evident from the literature. Due to the modifications to the “pressed” subscale as well as the use of the RPIQ with recreational athletes in the present study, the subscale structure of this adapted scale (RPIQ-Rec) was assessed using factor analysis methods. Results of this analysis are presented in the following chapter.

**Perceived Behavioral Assessment.** To assess participants’ perceptions regarding their behavioral intentions to play through injury, a scale was developed specifically for this study. The six questions included in this scale were selected based on the available research literature on injury in athletes. The six questions were written to assess study participants’ perceptions of their own behaviors. More specifically, each participant was asked whether they have played basketball through pain and injury in their past, whether they currently play basketball through pain and injury, and whether they expect to play basketball through pain and injury in the future. Accompanying each of these questions were 7-point Likert-type scales from 1 (lowest rating) to 7 (highest rating) that were adapted to the respective questions (see Appendix D).

Each of the first three questions was used in lieu of true behavioral assessments and observations. Although little self-report data has been utilized in the literature regarding injury, there have been a variety of researchers who assessed athletes’ self-reported perceptions of their past injury experiences and behaviors rather than conducting true behavioral assessments (Kress
& Statler, 2007; Liston, et al., 2006; Shaffer, 1997; Young & White, 1995). Self-reported behaviors may not correlate exactly with actual behaviors themselves, but self-reports have been accepted measures thus far by injury researchers within the literature, and are therefore appropriate for the present study.

Questions four and five of the perceived behavioral assessment asked about the most severe injury the athlete played through as well as the least severe injury with which the athlete decided to sit out. The final question asked why the athletes have made the decisions they have in regards to participation with injury. For purposes of the current study, the first three questions were summed and divided by three to obtain a single score for each participant that reported her or his total self-perceived behavior toward playing through injury. This total score was used for all analyses for the present study.

Operational Definition

In order to conduct a study pertaining to pain and injury, it is first necessary to define pain and injury in a way that can be measured, and in a standardized way that can be understood and followed by each of the participants. It is also necessary to elucidate that playing through injury is different than playing after injury, meaning the pain to which participants refer must be ongoing during participation, rather than simply participating after being hurt, without pain during the game. Chen, Williams, Fitness, and Newton (2008) state that pain/injury “gets people’s attention, alerts them to a threat to their well-being, and motivates them to take remedial action” (p. 789). This definition seems to be the most relevant to the present study, because most other definitions of injury involve a loss of playing time or reports to medical personnel, both of which are problematic when the research involves minimizing pain and playing through injury as well as recreational populations who may not always have medical personnel present.

The definition of playing through pain and injury utilized for the present study (as an adaptation of the previous definition) was participating while still feeling pain so that (a) the pain/injury needs some degree of mental attention during participation, (b) the pain/injury involved some sort of loss of, or change in function, that would directly affect performance capabilities, therefore indicating a threat to well-being, and (c) a decision process was necessary as to whether or not participation should and/or would be initiated and continued during this experience of pain/injury. This three part definition involved the getting of attention, the threat to well-being (functioning), and the motivation toward taking action (decision of whether to play
or not before and during the game), and would be most relevant to the present study involving recreational athletes. This definition was provided to participants within the directions of the self-perceived behavioral questionnaire in order to provide a consistent background and definition to each participant when answering the behavioral questions.

Data Collection Procedures

The recruitment process for the present study began with contacting the director of intramural sports at a mid-sized Midwest University in order to obtain names of the captains of each men’s, women’s, and co-ed intramural basketball team from the intramural website provided. Given the names of each captain, email addresses and phone numbers (when available) were retrieved from the University’s online student directory. Captains were then contacted and asked whether they would be willing to participate in a study involving attitudes toward playing through injury, and if they would be willing to help recruit their team members, with the opportunity for each participant to win a $25 gift certificate if their name was drawn at the conclusion of data collection. The males and females who were recruited and selected were notified that they did not qualify for the study if they were ever a university athlete, as that would place them in the “elite” category, which has been examined in many other studies (Hawkins & Fuller, 1998; Howe, 2001; Nixon, 1993; Roderick & Waddington, 2000; Young & White, 1995). The captains who agreed to participate were notified that any member of their team could choose not to participate in the study, and they were asked to provide dates they would be able to complete the study after an intramural game. The male and female athletes who agreed to participate from each team were notified that the investigator would be present at a variety of the intramural basketball games, and each player who wished to participate was asked to approach the investigator’s table to fill out the surveys and complete the study. Further recruiting was done at the intramural basketball arena, wherein the investigator asked players (pre-game) if they wished to participate in a study involving attitudes toward playing through injury. The present study was conducted within the intramural basketball arena, unless specific requests were made by the participants.

Each basketball player who agreed to participate in the study was given a packet of papers and writing utensil to complete the study. The first page consisted of the informed consent form which illustrated the purposes of the present study and was to be taken by each participant, as completion of the survey was considered consent. Once they read the informed
consent forms, they filled out the demographic questionnaire, followed by the AIMS. The participants subsequently completed the revised-RPIQ then the perceived behavioral assessment, the latter for which the participants were given the operational definition of pain and injury. Finally, each participant was asked to write down their name and contact information on a separate piece of paper and place it in a container for the drawing that was done at the conclusion of the study. Once the final step was completed, participants were thanked for their participation, asked if they had any questions, and dismissed once questions were answered.

**Statistical Analyses**

In order to answer the present research questions, it was necessary to perform a variety of statistical analyses with the achieved data. The following section presents the analyses that were used in the current study, including a factor analysis, reliability analyses, Pearson correlations, and MANOVA.

**Factor Analysis.** As noted earlier, the RPIQ-Rec used in this study was a slightly modified version of the RPIQ developed and validated by Walk and Wiersma (2005). Furthermore, the reliability and validity data presented by Walk and Wiersma (2005) was based on male and female varsity collegiate athletes, which may or may not be reproduced using a recreational sample of athletes. For these reasons, an exploratory factor analysis was conducted to determine the factor structure of the RPIQ-Rec for participants in this study.

**Reliability Analyses.** In order to determine the internal consistency and reliability of the questionnaires used for the present study, Cronbach’s alphas were obtained for the RPIQ-Rec, AIMS, and Self-Perceived Behavioral Questions.

**Pearson Correlations.** To determine whether the participants’ attitudes regarding playing through pain and injury (the subscales obtained from the RPIQ-Rec) would be significantly related to their self-perceived behaviors toward playing through injury, a series of univariate Pearson correlation analyses were conducted. Specifically, these analyses examined the degree of the relationship between the subscales from the RPIQ-Rec and the single behavioral score obtained from the first three items of the Self-Perceived Behavioral Questionnaire.

**MANOVA.** The primary purpose of this study was to determine whether recreational athletes’ perceptions and behavioral intent to play through injury would vary as a function of their gender and level of athletic identity. To assess this study purpose a 2 (gender) x 3 (athletic identity) multivariate analysis of variance (MANOVA) was conducted on the present data.
CHAPTER THREE

Results

The purposes of the present study were to determine if recreational athletes’ perceptions or attitudes regarding playing through injury as well as their self-perceived behaviors of actually playing through injury would differ as a function of their gender or level of athletic identity. The first hypothesis was that males, when compared to females, would have perceptions more favorable toward playing through injury and express a stronger self-perceived tendency to actually play with injury. The second hypothesis was that those with higher athletic identity, compared to those with lower athletic identity, would have perceptions more favorable toward playing through injury and express a stronger self-perceived tendency to actually play with injury.

Preliminary Analyses

Prior to examination of the main study hypotheses, a series of preliminary analyses were conducted. The results of these analyses included an exploratory factor analysis and reliability assessments. First, an exploratory factor analysis was conducted using the 13 items from the RPIQ-Rec. This analysis was conducted because the RPIQ as revised by Walk and Wiersma (2005) as well as the original RPIQ (Nixon, 1996a) were developed and tested for reliability and validity with samples of elite athletes. Thus, it is not known if the same subscales identified in those samples may apply to the current study sample comprised of recreational athletes. In addition, some of the items on the Walk and Wiersma (2005) RPIQ were re-worded for the current study. It was therefore deemed necessary to conduct an exploratory factor analysis with the current study sample (Reise, Waller, & Comrey, 2000).

Because the RPIQ-Rec data were normally distributed, factors were extracted using maximum likelihood procedures with varimax rotation (Fabrigar, Wegener, MacCallum, & Strahan, 1999). To determine the number of factors to be retained, the eigenvalues and scree plot were examined. These results supported the retention of two factors, with eigenvalues equal to 4.992 and 3.194. Total variance explained across the two factors was 62.97%.

The loadings for each RPIQ-Rec item, as obtained from the rotated factor matrix, are presented in Table 1. To interpret these loadings, a criterion of .40 (a value that corresponds to 16% of overlapping variance with other items in that factor; Tabachnick & Fidell, 2001) was selected as the minimum loading. Examination of the factor loadings revealed only one item that
cross-loaded. This was item 11 (only athletes understand what it is like to play with injuries and pain) which showed a loading of .582 on factor one and .433 on factor two.

After visual analysis of the items that loaded on each of the factors, it appears that the first factor represented personal attitudes about risk, pain, and injury (e.g., athletes should ignore the pain, no pain no gain), while the items in the second factor illustrated socially-influenced attitudes toward risk, pain, and injury (e.g., teammates are impressed with those who play with injuries and pain).

Although the two factors found in the current study do not replicate the three found by Walk and Wiersma (2005), they do represent similar constructs. Specifically, one of the factors derived by Walk and Wiersma (2005) was identified as “pressed”, and consisted of the same four items as found in the second (socially-influenced attitudes) factor in the present study. The nine items that were found to load highly in the first factor in the current study were divided into two factors by Walk and Wiersma (2005), and called “identity” and “tough”. These contracts, when combined, seem comparable to the first factor (independent personal attitudes) from the present study.

In general, the two-factor solution that was obtained in this study is similar to the three-factor structure obtained by Nixon (1996a) and Walk and Wiersma (2005). However, the two-factor structure best represents the underlying subscale structure for recreational sport athletes, and is used in the following main study analyses. The two factor scores, calculated by using factor pattern weights from the factor analysis, were used in all subsequent study analyses, and arithmetic means were computed for tables and descriptive statistics.

Internal consistency for the AIMS scale as well as for the two factors obtained from the RPIQ and the self-perceived behavioral questionnaire was assessed using Cronbach’s alpha. The coefficients obtained from these analyses are illustrated in the far-right column of Table 2. Examination of these coefficients show they were all at or above .89, thus exceeding the .70 value established by Nunnally (1978), supporting the internal consistency of the scales.

**Descriptive Results**

Participants were asked to rate themselves on self-perceived ability level in the demographic questionnaire, (M=5.22, SD=1.80). Each participant was also asked how many injuries they had experienced in their career playing basketball, and of the 97 who answered, they averaged approximately four injuries (SD=4.00).
Table 2 provides descriptive statistics for all participants on scores from the AIMS, RPIQ subscales, and Self-Perceived Behavioral Questionnaire. This data includes means, standard deviations, ranges, skewness statistics, and Cronbach’s alphas. Examination of this descriptive data indicates that for each of the questionnaires utilized, the mean scores were slightly above the midpoint of the Likert-style scales. The descriptive statistics were based on at least 127 of the 130 participants, so missing data did not pose a problem.

Regarding the AIMS, male recreational basketball players scored 4.29 (SD=1.08). In comparison, in Brewer et al.’s (1993) study, male recreational/fitness athletes scored 3.48 (SD=.99), male intramural/local/regional athletes scored 4.68 (SD=.74), and male intercollegiate/national athletes scored 5.46 (SD=.91). Therefore, male intramural athletes from the present study scored similarly on athletic identity as other intramural athletes. Regarding female athletes, those in the present study scored 3.67 (SD=1.17) on the AIMS, while previous females in the recreational/fitness athlete group scored 3.04 (SD=1.10), the intramural/local/regional athletes scored 4.04 (SD=.90), and the intercollegiate/national athletes scored 5.34 (SD=.91). Thus, female intramural athletes in the present study scored slightly lower than previously, although the scores are comparable.

**Main Analyses**

First, in order to determine whether study participants’ behavioral intentions regarding playing through pain and injury were consistent with their attitudes toward injury, a series of univariate Pearson correlations were conducted to assess the degree of association between the single score derived from the behavioral questionnaire and the two RPIQ subscales. These correlational analyses were conducted separately for males and females. For males, results indicated that the self-perceived behavioral score was significantly correlated with the scores on the personal RPIQ subscale, \( r(125) = .49, p < .001 \), and with the scores on the socially-influenced RPIQ subscale, \( r(125) = .31, p = .01 \). As for females, the self-perceived behavior score was significantly correlated with scores on the personal RPIQ subscale, \( r(125) = .56, p < .001 \), and with scores on the socially-influenced RPIQ subscale, \( r(125) = .38, p < .001 \). These results showed that the behavioral measures involving injury in the present study were significantly, positively, and moderately related to the attitude measures involving injury for both males and females, offering some evidence that study participants’ attitudes toward playing through injury are related to their perceived behaviors toward actually playing through pain and injury.
The overall purpose of the current study was to determine if recreational basketball players’ attitudes toward playing through injury and their behavioral intentions to do so would vary as a function of gender and level of athletic identity. To examine this issue, a 2 x 3 (gender x athletic identity) MANOVA was conducted. To obtain the three athletic identity groups, participants were divided into the top 25% of scores, the middle 50% of scores, and the bottom 25% of scores. These groups were defined as high, moderate, and low athletic identity respectively. This upper and lower quartile split into high and low athletic identity respectively is consistent with methods that have been used in the literature (Lantz & Schroeder, 1999; McCallum, Zhang, Preacher, & Rucker, 2002). In particular, for the current study, the use of this categorical system was selected based on the desire to compare individuals in the sample who were at the high end of athletic identity for recreational athletes (top 25% of the current sample) with those who were at the low end (bottom 25% of the current sample). The middle 50% group, then, represented individuals who could not be classified as either high or low in athletic identity relative to the present sample. Given the scores from the present sample, AIMS scores of 4.8 and above were placed in the high athletic identity category, scores of 3.1 and below in the low athletic identity category, with all remaining scores being placed in the middle category.

These three athletic identity groups were then used in the 2 x 3 (gender x athletic identity) MANOVA. The dependent variables for this analysis were the personal attitudes RPIQ subscale, the socially-influenced attitudes RPIQ subscale, and the Self-Perceived Behavior score. Results from this MANOVA revealed a non-significant gender x athletic identity multivariate interaction effect, Wilks’ $\Lambda = .99$, $F(6,234)=.29$, $p=.94$, partial $\eta^2=.01$. Contrary to expectation, there was also no significant main effect for gender, Wilks’ $\Lambda = .99$, $F(3,117)=.60$, $p = .61$, partial $\eta^2=.02$.

However, results of the multivariate analysis for the main effect of athletic identity (AIMS scores) indicated a significant overall difference among the three levels of athletic identity, Wilks’ $\Lambda = .63$, $F(6,234)=10.14$, $p < .001$ (partial $\eta^2=.21$; see Table 3 for descriptive statistics and univariate results). These results indicate that the three athletic identity groups (high, moderate, low) did differ significantly on the combined set of three dependent variables, accounting for 21% of the variance.

Examination of the coefficients for the linear combinations distinguishing the three athletic identity groups revealed that the three groups differed significantly on all three dependent variables. Inspection of the univariate post-hoc $F$-values further supported the
significance of the group differences on all three dependent variables. That is, the three athletic identity groups differed on both subscales from the RPIQ-Rec, $F(2,119)=20.87$, $p<.001$, partial $\eta^2=.26$ for the personal injury attitudes subscale, $F(2,119)=6.65$, $p<.001$, partial $\eta^2=.10$ for the socially-influenced injury attitudes subscale, and also for the self-perceived behaviors, $F(2,119)=18.95$, $p<.001$, partial $\eta^2=.24$. Although significant group differences were found for all three dependent variables, the effect sizes indicate a relatively larger portion of the variance was explained by the personal injury attitudes RPIQ subscale (26%) and by the self-perceived behaviors (24%). Furthermore, a relatively smaller amount of the variance was explained by the socially-influenced injury attitudes RPIQ subscale (10%), although this approached a medium effect.

To compare each of the three levels of athletic identity, post hoc analyses were necessary to conduct. Using Tukey’s HSD post hoc analysis, it was determined for the personal attitudes RPIQ subscale that those with high athletic identity (M=3.07, SD=.66) scored significantly higher than those with a moderate athletic identity (M=2.59, SD=.58), who scored significantly higher than those with a low athletic identity (M=1.89, SD=.48). For the socially-influenced attitudes subscale of the RPIQ, those with high athletic identity (M=2.84, SD=.72) scored significantly higher than those with low athletic identity (M=1.77, SD=.66), but neither high nor low athletic identity scored significantly different than those with moderate athletic identity (M=2.36, SD=.71). Finally, in terms of the self-perceived behavioral questionnaire, those with high athletic identity (M=5.12, SD=1.13) scored significantly higher than those with moderate athletic identity (M=4.20, SD=1.34) who scored significantly higher than those with low athletic identity (M=3.00, SD=1.08).

These results indicate that male and female recreational basketball players did not differ in either their attitudes toward playing through pain and injury or their self-reported behavioral intentions to do so. However, recreational basketball players who exhibited higher levels of athletic identity revealed that they had more positive personal attitudes toward playing through pain and injury, they perceived that their teammates influenced them to play through pain and injury more, and they self-reported a higher willingness to actually play through pain and injury than participants who exhibited a lower level of athletic identity.
Supplemental Analyses

To conduct the MANOVA described in the previous section, it was necessary to group athletes into those who were high, moderate, or low in athletic identity. However, scores on the AIMS are continuous. Thus, grouping these scores into specific categories may not be the ideal way to assess the relationship between participants’ athletic identity and their attitudes and self-perceived behaviors regarding playing through pain and injury (see arguments by MacCallum et al., 2000). Therefore, it was deemed necessary to also assess this relationship using regression analyses. Based on previous research showing that males and females differ significantly in athletic identity (Tasiemski, Kennedy, Gardner, & Blaikley, 2004; Wiechman & Williams, 1997), an independent samples t-test was conducted to determine if such gender differences would also be present in the current study sample. Results indicated that males (M=4.29, SD=1.08) score significantly higher on the AIMS than did females (M=3.67, SD=1.17), t(127)=3.09, p <.001. Thus, any variability in the dependent variable scores accounted for by gender might be confounded with athletic identity effects.

Therefore, a set of three multivariate hierarchical regression analyses were conducted to examine whether participants’ athletic identity scores would be able to predict their injury attitudes and behaviors. The dependent variables for the three regression analyses were the two factor scores from the RPIQ-Rec and the single behavioral score from the Self-Perceived Behavioral Questionnaire. For each of these analyses, gender was entered at the first level followed by athletic identity at the second level. The results of these three hierarchical regression analyses are presented in Tables 4-6.

Examination of the results for the personal injury attitudes subscale (Table 4) revealed that gender, when entered alone (Step 1), significantly predicted participants’ scores on the personal injury attitudes subscale, F(1,123)=8.24, p=.01, adjusted R²=.06. However, this model only explained 6% of the variability in participants’ scores on the subscale. When athletic identity scores were added to the regression equation (Step 2), significant improvement in the variance explained was seen, R² change=.30, F(1,122)=57.20, p<.001. Thus, the two variables together (gender and athletic identity) significantly predicted scores on the dependent variable (adjusted R²=.36). Given that the second model accounted for 36% of the variability in participants’ scores on this subscale, the combined effect was considered large. However, examination of the standardized beta weights for the entry model suggested that athletic identity
was the only significant predictor ($\beta=.57$, $t=7.56$, $p<.001$), while the beta weight corresponding to gender (-.10) was not significant.

Regarding the socially-influenced injury attitudes subscale of the RPIQ (Table 5), examination of the results revealed that gender, when entered alone (Step 1), did not significantly predict participants’ scores, $F(1,123)=.18$, $p=.67$, adjusted $R^2=.01$. When athletic identity scores were added to the regression equation (Step 2), significant improvement was seen in the variance explained, $R^2$ change=.14, $F(1,122)=19.06$, $p<.001$. Thus, the two variables together (gender and athletic identity) significantly predicted scores on the socially-influenced injury attitudes RPIQ subscale (adjusted $R^2=.12$). Given that the second model explained 12% of the variability on participants’ scores on this subscale, the combined effect was considered medium. However, examination of the standardized beta weights for the entry model suggested that athletic identity was the only significant predictor ($\beta=.38$, $t=4.37$, $p<.001$), while the beta weight corresponding to gender (.06) was not significant.

In terms of the self-perceived behavioral score (Table 6), examination of the results revealed that gender, when entered alone (Step 1), significantly predicted participants’ scores, $F(1,127)=6.55$, $p=.01$, adjusted $R^2=.04$. However, this model only explained 4% of the variability in participants’ scores on the self-perceived behavior score. When athletic identity scores were added to the regression equation (Step 2), significant improvement was seen in the variance explained, $R^2$ change=.32, $F(1,126)=62.32$, $p<.001$. Thus, the two variables together (gender and athletic identity) significantly predicted scores on the self-perceived behavior score (adjusted $R^2=.35$). Given that the second model accounted for 35% of the variability in participants’ self-perceived behavioral scores, the combined effect was considered large. However, examination of the standardized beta weights for the entry model suggested that athletic identity was the only significant predictor ($\beta=.58$, $t=7.89$, $p<.001$), while the beta weight corresponding to gender (-.07) was not significant.

Reverse order hierarchical regression analyses were also conducted with athletic identity entered at the first step and gender entered at the second step. The results from these three analyses revealed that gender did not contribute significantly to the prediction of any of the dependent variables (the two RPIQ-Rec subscale scores and the self-perceived behavior score) above and beyond that explained by the athletic identity score. Thus, these results combined with the previously explained hierarchical regression results suggest that gender does not
contribute significantly to the variation in attitudes and self-perceived behaviors toward playing through pain and injury.

Generally, these results indicated that higher athletic identity scores significantly predicted higher scores on the personal injury attitudes subscale of the RPIQ, the socially-influenced injury attitudes subscale of the RPIQ, and the self-perceived behavioral questions. Two of the analyses illustrated that gender alone significantly predicted scores on the individual RPIQ subscale and the self-perceived behavioral questionnaire, but when it was paired with athletic identity scores, gender was not a significant predictor of these scores. Given the results of the independent samples t-test showing males have a significantly higher athletic identity than females in this sample, it was determined that the reason gender alone predicted two of the dependent variables was because males and females differed on scores of athletic identity, meaning gender effects were confounded with AIMS scores. Therefore, gender effects were determined to have little meaning in the present study because they were dominated by athletic identity effects.
CHAPTER FOUR
Discussion

The results of the preliminary analyses revealed that the RPIQ-Rec was valid and reliable for the present study. Specifically, the two factor structure obtained from the factor analysis explained approximately 63% of the variability in scores for the current sample, and the Cronbach’s alpha obtained from each subscale surpassed the .70 necessary to establish reliability. However, it is necessary to strengthen both reliability and validity for the revised RPIQ discussed by Walk & Wiersma (2005) as well as the recreational-specific RPIQ-Rec for use in future analyses concerning attitudes toward injury. Furthermore, reliability and validity must be analyzed in regards to multiple sports and contexts for both versions of this questionnaire.

Athletic Identity

Results supported the hypothesis regarding the relationship between athletic identity and attitudes and behaviors toward injury, although the hypothesis concerning the relationship between gender and attitudes and behaviors toward injuries was not supported. Specifically, those who were “high” in athletic identity scored significantly higher than those who were “moderate” and “low” in athletic identity in personal attitudes toward playing through injury, socially influenced attitudes toward playing through injury, and self-perceived willingness to actually play through injury, supporting the hypothesis related to athletic identity. However, there were no significant differences between females and males in their attitudes and self-perceived behaviors toward playing through injury, which did not lend support to the hypothesis regarding gender. Furthermore, using a regression analysis the support/lack of support for the hypotheses was strengthened because gender did not significantly predict scores on attitudes and self-perceived behaviors toward playing through injury, while level of athletic identity did over and above gender.

The literature concerning the relationship between athletic identity and the sport culture provides support for the above findings. Specifically, athletes participate within the sport culture, which is a culture that encourages ignoring and normalizing injury, because it is a risk that athletes must often take in order to succeed in their sport (Albert, 1999; Nixon, 1993; Roderick & Waddington, 2000). Similarly, within the sport culture athletes are exposed to the sport ethic, which is the constant message that sport comes above all else and that athletes must
do anything it takes to continue participation in their sport, even if that means playing while injured or in pain (Hughes & Coakley, 1991; Nixon, 1996b). Furthermore, athletes who participate within the sport culture receive the messages posed by the sport ethic via significant others within the same culture, called sportsnets (Nixon, 1992). With constant exposure to these sportsnets, many athletes are not only constantly receiving messages telling them to ignore and play with injuries and pain, but they often do not accept outside opinions that may counter those they are used to hearing. This is because athletes often see other athletes and coaches as the only people who understand their situation, with those outside of the sport culture not really understanding the competitive sport environment. In essence, athletes tend to adhere to the advice of other athletes and coaches over that of people outside the sport culture, often leading them to have positive attitudes toward playing through injury. Therefore, many athletes who internalize the sport culture and place high value on their sportsnets have attitudes consistent with playing through injury and actually play through injury. For the athletes in the present study, it seems as though this was the case. Specifically, those who identified strongly with the athlete role, strongly internalizing the sport culture and ethic, had personal and socially-influenced attitudes regarding playing with injury as acceptable and they actually perceived that they played through injury in their lives. Conversely, those who identified less strongly with the athlete role, as measured by the AIMS, had personal and socially-influenced attitudes not as accepting of playing through injury, and were also less likely to perceive that they played through injury in their past.

Another possible explanation for the present findings is that the recreational athletes who had more overall basketball playing experience in terms of years had higher levels of athletic identity than those with fewer years of experience. Furthermore, highest level of basketball reached accounted for levels of athletic identity, in that those who reached high school or traveling team levels had higher athletic identities than those who had reached only recreational levels of playing experience. Athletes who have more experience at higher levels of their sport are more likely to have the time and receive more messages to internalize the culture of their sport, leading to a higher level of athletic identity and ultimately the associated thoughts and behaviors, such as having thoughts and behaviors consistent with playing through injury.

An interesting finding concerning the levels of athletic identity in the current sample is that for both female and male intramural basketball players, AIMS scores were comparable to
scores for the intramural athletes in Brewer et al.’s (1993) sample, although well below athletic identity levels obtained from elite athlete samples. Therefore, it seems as though the current participants’ attitudes toward playing through injury and the self-perceived willingness to do so may be representative of the intramural population due to similar levels of athletic identity. It is also important to note that the positive attitudes toward playing through injury and self-perceived willingness to do so found in the present study are not because the present sample was comparable to varsity athletes in regards to athletic identity. Thus, an athlete does not have to have the mentality of an elite athlete in order to be willing to play through pain and injury.

**Gender**

Regarding gender, the finding that males did not have more positive personal and socially-influenced attitudes toward injury or higher levels of self-perceived behaviors toward playing with pain and injury than females did not support the hypothesis. However, there is social psychological literature that can help explain the findings. It can be expected that females show similar injury attitudes and behaviors as males because they participate within the same sport culture, and are socialized into their sports in similar ways by the same people as males (Young, 1997; Young, White, & McTeer, 1994). Despite the evidence of more similarities than differences between males and females in the injury literature, some researchers have mentioned that there still may be differences, but they may be simply a degree of difference (Gard & Meyenn, 2000; Nixon, 1996a). Given the present findings, however, that degree of difference does not exist between male and female recreational basketball players. Specifically, since there were no significant differences between males and females in injury attitudes or self-perceived behaviors, the idea of a degree of difference is not applicable. Furthermore, given the fact that males had a significantly higher athletic identity than females, which is consistent with the literature (Tasiemski, Kennedy, Gardner, & Blaikley, 2004; Wiechman & Williams, 1997), if a gender difference was found it might be confounded with athletic identity.

Another potential explanation for the lack of differences between females and males in the present sample involves the gender similarities hypothesis (Hyde, 2005), which states that “males and females are similar on most, but not all, psychological variables” (p. 581). Specifically, Hyde said that many researchers tend to search for gender differences in various psychological constructs, but given the effect sizes from 128 studies, it became evident that most effect sizes were in the near-zero or small range. Given the information from this meta-analysis,
Hyde concluded that males and females are more similar than different. However, this hypothesis has yet to be adapted to sporting contexts, which tend to be widely viewed in a more gender-divided perspective. Given the results of the present study that males and females did not differ in their attitudes or self-perceived behaviors toward injury, this could serve as evidence for a gender similarities hypothesis for sport. More research would be needed to further elaborate on these “no difference” findings in sporting contexts.

Another notable finding from the present study, based on visual rather than statistical analysis, was that at the highest level of athletic identity, females’ scores were slightly higher than those of males on all three dependent variables, including both subscales of the RPIQ-Rec and the self-perceived behavioral questions (See Table 4). Although these differences were not statistically different, it is interesting to note that at high levels of athletic identity, female athletes may have equal or more positive attitudes toward injury than male athletes. Other research indicates that female athletes with high levels of athletic identity score equally or higher than males on other psychological variables. For example, Lirgg (1991) discovered via a meta-analysis on self-confidence, that although males generally had higher levels of self-confidence than females in sport, competitive, or comparative, sport situations did not give males a self-confidence advantage. Therefore, females and males specifically in these competitive situations would be equal in self-confidence. However, Lirgg (1991) also found that males had a self-confidence advantage in “male tasks” while females had the self-confidence advantage in “female tasks”. Perhaps the sport of basketball, especially in a recreational sense, is gender-neutral enough of a task that at higher levels of competition or athletic identity there are simply no gender differences in injury attitudes and behaviors. Hardin & Greer (2009) illustrated that basketball has been difficult to classify as a gendered sport, because males tend to identify it as masculine, while females do not. If basketball is a sport that females do not see as a “male task”, males would not have a particular self-confidence advantage, and they may not have more positive attitudes or self-perceived behaviors toward injury either.

Another example of the possibility of males and females being similar in specific psychological variables at higher levels of athletic identity comes from Vealey (1988), who found that elite males and females did not differ on self-confidence scores in a sample of high school and college athletes who participated in basketball among other sports. Given the sociological structure of the sport culture previously described, it makes sense that elite athletes
would have a stronger athletic identity, and perhaps stronger athletic identity is related to gender similarities in psychological variables such as self-confidence and attitudes toward injury, among others. However, future research should attempt to study this notion.

The current study also found that males and females significantly differ in levels of athletic identity. Specifically, males exhibited a significantly higher athletic identity than females, which is consistent with the literature. One possible explanation for this difference is based on gender roles. Specifically, sports have often been seen as a male domain, in that males who participate in sports and females who do not are seen as conforming to expectations, and males who do not participate in sports and females who do are seen as deviant (Lantz & Schroeder, 1999). Therefore, if conforming to expectations and pressures placed on them by societal norms, males would be more likely to participate in sport and identify strongly with the athlete role, and females would be less likely to participate in sport and identify weakly with the athlete role. Perhaps the levels of athletic identity of males and females are simply conformities to expectations of role. However, our society has experienced a transformation in gender roles, and in particular to sport, it is more acceptable for females to participate in sport (and males to not participate in sport) than it has been in the past. It is possible, though, that it is still not equally acceptable for females to identify strongly as athletes as males.

An additional explanation for the difference in athletic identity involves the self-report nature of the AIMS. In regards to confidence, males have been shown to overstate their confidence levels based on self-report data, while females have been shown to understate their confidence levels (Corbin, Landers, Feltz, & Senior, 1983). Perhaps this is the case for athletic identity as well, and males are likely to overstate their athletic identity, while females may understate theirs when the measure is self-reported. Hence, males would have a significantly higher athletic identity than females, but it might simply be an issue of the measure rather than the construct being measured.

There are a number of findings from the present study that contribute to the existing psychology of injury literature. First, the findings were based on data retrieved from recreational athletes. Specifically, it was found that recreational athletes express positive personal and socially-influenced attitudes toward playing through injury, and they express a willingness to actually play through pain and injury. This finding is notable because the notion of playing through injury has been established for elite athletes, who are expected to participate through
injury because sport may be their livelihood, and they may be receiving direct rewards for their continued participation. However, the idea of playing through injury seems counterintuitive for recreational athletes, because they are not directly rewarded for participation. Second, the current study contributed empirical data to the sociologically studied idea of playing through injury. There is literature that explains the notion of playing through injury for elite athletes and why they may participate in such behaviors (due to the pressures and norms of the sport culture), but there has yet to be empirical evidence to support this relationship. Finally, the relationship between gender and playing through injury has yet to be studied, and the current study contributes the idea that perhaps males and females do not differ in their attitudes and behaviors toward playing through pain and injury.

Limitations and Future Research

There were a few limitations in the present research. First, gender and athletic identity, the two independent variables, were significantly correlated with each other. This allows for potential effects of gender to be hidden within athletic identity. Therefore, if there are effects of gender on attitudes and perceived injury behaviors, they may not have been identified in the present study due to the relationship between gender and athletic identity. Second, although collegiate intramural athletes without varsity experience were purposely chosen to represent recreational athletes, these basketball players competed in a league that offered playoffs and a championship, which may have influenced their attitudes regarding injury. Specifically, playing through injury could be a means of achieving an external reward, which is the same reason many elite athletes decide to play through injury. There were also other, more competitive intramural leagues to study, so there seem to be multiple levels of recreational/intramural athletes that were not represented by the present sample. Third, although each participant was asked to explain why they made the decisions they had regarding playing through injury in their careers, that question was not answered enough to be able to determine a conclusion. Therefore, a participant-derived explanation for the results could not be determined for the present study. A fourth limitation is that the sample was a relatively small number of students specifically at a Midwest University, which presents a possibility of a lack of generalization to other populations. Fifth, the present study used self-report data which could surrender accuracy, especially in the behavioral questionnaire in which participants were asked to identify their behaviors rather than their behaviors being directly assessed. Although the self-perceived behaviors were correlated
with the injury attitudes, the correlations were not perfect. Finally, there were two notable methodological limitations in the present study. First, the tenth and final item on the AIMS stated “I would be very depressed if I were injured and could not compete in sport.” This question was answered by participants immediately before beginning the RPIQ-Rec, so they may have been primed to think about injury and connect athletic identity to injury before answering the injury-related RPIQ-Rec questions. Given the strength of the relationship between athletic identity and injury attitudes, this is a possibility. Second, the questionnaires in the present investigation were not counterbalance, so potential order effects were not prevented.

Regarding future research, it is necessary to further establish whether or not there are gender differences in injury attitudes and behaviors, specifically by testing the gender similarities hypothesis for sport. Researchers often attempt to find gender differences in sport-related psychological variables, but perhaps it would be interesting and informative to attempt to find similarities. This would have implications for interventions needing to be gender-specific or not. Relatedly, it is also necessary to further determine the reliability and validity of the RPIQ and RPIQ-Rec so a psychometrically validated questionnaire can be utilized. Another possible future research direction involves discovering why recreational athletes make the decisions they make in regards to playing with injuries and pain. This question has yet to be answered in regards to recreational athlete populations. Furthermore, it is important to identify who is at risk to play with injuries and pain, seeing that it is a major health risk. Also, future researchers could attempt to discover how wide-reaching the willingness to playing through injury is, including, but not limited to, if children tend to play through injury and how young the tendency appears, or even if people are willing to exercise through injury. It might also be interesting to investigate possible developmental differences in athletic identity, including differences between ages and levels, as well as how athletic identity may change throughout an athlete’s lifespan. Finally, it may be informative to discover the attitudes of coaches towards their athletes’ athletic identity and injury attitudes. Specifically, what are coaches’ attitudes towards, how strongly they want their athletes to identify with the athlete role, what they want their athletes to be willing to do in order to be successful, as well as how these notions differ by age or level.
References


Appendix A: Demographic Questionnaire

Age:

Sex:   M       F

Years of Basketball Experience:

Highest Level of Basketball Reached:

How many hours a week do you play basketball?

What do you feel is your ability level in terms of playing basketball?

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<th>7</th>
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<tr>
<td>Not very Good</td>
<td>OK</td>
<td>Good</td>
<td>Very Good</td>
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How many injuries (that you remember) have you experienced in your career as an athlete?

What were the types of the injuries you remember through your athletic career?

Can you tell me anything else about yourself that might be relevant to a study involving injury?
Appendix B: Athletic Identity Measurement Scale (Brewer, Van Raalte, & Lender, 1993)

Directions: Please read each statement carefully and circle the number associated with your response that best represents your attitudes as a recreational basketball player.

1. I consider myself an athlete.
   - 1. Strongly Agree
   - 2. Neither Agree nor Disagree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree

2. I have many goals related to sport.
   - 1. Strongly Agree
   - 2. Neither Agree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree

3. Most of my friends are athletes.
   - 1. Strongly Agree
   - 2. Neither Agree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree

4. Sport is the most important part of my life.
   - 1. Strongly Agree
   - 2. Neither Agree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree

5. I spend more time thinking about sport than anything else.
   - 1. Strongly Agree
   - 2. Neither Agree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree

6. I need to participate in sport to feel good about myself.
   - 1. Strongly Agree
   - 2. Neither Agree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree

7. Other people see me mainly as an athlete.
   - 1. Strongly Agree
   - 2. Neither Agree
   - 3. Neither Agree nor Disagree
   - 4. Neither Agree nor Disagree
   - 5. Neither Agree nor Disagree
   - 6. Neither Agree nor Disagree
   - 7. Strongly Agree
8. I feel bad about myself when I do poorly in sport.

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<tr>
<td>Agree</td>
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<td>Neither Agree nor Disagree</td>
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<td>Disagree</td>
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9. Sport is the only important thing in my life.

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<td>Agree</td>
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<td>Neither Agree nor Disagree</td>
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<tr>
<td>Disagree</td>
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10. I would be very depressed if I were injured and could not compete in sport.

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<tr>
<td>Agree</td>
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<td>Neither Agree nor Disagree</td>
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<td>Disagree</td>
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Appendix C: Risk, Pain, and Injury Questionnaire (adapted by Walk & Wiersma, 2005)

**Directions:** Please read each statement carefully and circle the number associated with your response that best represents your attitudes as a recreational basketball player.

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<tbody>
<tr>
<td>1. No pain, No gain.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
</tr>
<tr>
<td>2. Athletes who endure pain and play hurt deserve our respect.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
</tr>
<tr>
<td>3. Teammates make athletes feel guilty if they don’t want to play hurt or with pain.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
</tr>
<tr>
<td>4. Athletes who care about their team will try to play with injuries and pain.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
</tr>
<tr>
<td>5. Athletes should “tough it out” with an injury or pain today and not worry about the effects tomorrow.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<tr>
<td>6. Teammates only care about players who are healthy and able to play.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<tr>
<td>7. Every athletes should expect to have to play with an injury or pain sometime.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<td>8. Teammates say they don’t want athletes to play with serious injuries, but they actually push them to play if they are needed.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<td>9. Athletes should ignore the pain.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<td>10. Teammates are impressed with those who play with injuries and pain.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<td>11. Only athletes understand what it is like to play with injuries and pain.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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<td>12. Playing with injuries and pain demonstrates character and courage.</td>
<td>1</td>
<td>Strongly disagree</td>
<td>2</td>
<td>disagree with reservations</td>
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13. Athletes will do everything possible to play despite injuries and pain.

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<td>Strongly</td>
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<td>disagree</td>
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<tr>
<td>with reservations</td>
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<td>agree</td>
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<tr>
<td>strongly</td>
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<tr>
<td>disagree</td>
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<tr>
<td>with reservations</td>
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Appendix D: Self-Perceived Behavioral Questionnaire

Directions: Please read each question carefully and give the response that best represents you as a recreational basketball player. As you think about each question, consider the definition of pain and injury given below.

Definition of pain and injury: Playing basketball while still feeling pain so that (a) the pain/injury needs some degree of mental attention during participation, (b) the pain/injury involved some sort of loss of, or change in function, that would directly affect performance capabilities, therefore indicating a threat to well-being, and (c) a decision process was necessary as to whether or not participation should and/or would be initiated and continued during this experience of pain/injury.

1. Have you played basketball through pain and injury in your past?
   
   1 2 3 4 5 6 7
   Almost never occasionally almost always

2. Do you currently play basketball through pain and injury?

   1 2 3 4 5 6 7
   Almost never occasionally almost always

3. Do you expect that you will play basketball through pain and injury in your future?

   1 2 3 4 5 6 7
   Almost never occasionally almost always

4. What was the most severe injury you have ever played basketball through?

5. What was the least severe injury that has ever led you to sit out of basketball?

6. Why have you decided to make the decisions you make in regards to playing through injury?
Appendix E: Informed Consent Form

Title: Gender, Athletic Identity, and Attitudes Toward Playing Through Injury in Collegiate Intramural Basketball Players

Sponsor: None

Investigators: Daniel P. Vernau and Dr. Robert Weinberg

This consent form may contain words that you do not understand. Please ask the study investigator to explain any words or information that you do not clearly understand. You will be given a signed copy of this consent form to take with you. In this consent form, “you” always refers to the participant.

Purpose of the study: The purpose of this research study will be to examine the relationship between gender, athletic identity, and attitudes associated with playing through injury for recreational athletes.

Procedures: You will be asked to fill out surveys that will take approximately 10 minutes to complete. You will then be asked to put your name and contact information on a separate piece of paper to be entered into a drawing done after the research is complete.

Risks and discomforts: The risks to participation in this study are minimal. The only potential discomfort could be thinking or writing about playing with pain and injury.

Benefits: The benefits involved with participation in this study can include but are not limited to identifying if you are at risk to play through injury in order to raise self-awareness, and contribution to the scientific body of knowledge regarding the psychology of injury. The contribution to the scientific body of knowledge will be to help identify those athletes who may be more at risk to play with injury, in order to carry out interventions to prevent such behaviors that can lead to re-injury, developmental problems for younger athletes, and chronic pain and injury.

Payment for participation: There is no direct payment for participation in this study, although one participant who completes the study will get their name drawn to win a $25 gift card.

Confidentiality & Anonymity: Confidentiality and Anonymity of personal information about you, including responses to questions you answered in connection with this study, will be guaranteed.

Although results of this research may be presented at meetings or in publications, no identifiable personal information pertaining to participants will be utilized in this study, so no personal information will be disclosed. Anonymity and confidentiality will be maintained by assigning you a participant number and by keeping all materials related to you locked in a desk in a locked room in the Graduate Offices of Phillips Hall, to which only the principal investigator will have access.

Voluntary participation and withdrawal: Your participation in this study is voluntary. You may decide to not participate in this study. If you do participate, you may freely withdraw from the study at any time. You can also choose not to answer a specific question (if it is troubling to you for any reason) rather than completely withdraw from the study. Your decision will not change your future relationship with Miami University.
Questions: If you have questions about your study participation or would like a copy of the results of this study, please contact Daniel Vernau (vernaud@muohio.edu) or Dr. Robert Weinberg (weinber@muohio.edu) of the Department of Kinesiology and Health.

If you have any questions about your rights as a research subject, you may contact:

Office for the Advancement of Research and Scholarship
Miami University
Oxford, Ohio 45056
(513-529-3600) or humansubjects@muohio.edu

I have been provided with an opportunity to read this consent form carefully. All of the questions that I wish to raise concerning this study have been answered. My participation in/completion of the surveys indicates that I freely consent to participate in this research study and that I am at least 18 years of age.
Table 1.

*Factor Loadings, Eigenvalues, and Total Variance Explained for the RPIQ Factors*

<table>
<thead>
<tr>
<th>Factor</th>
<th>1 (personal attitudes)</th>
<th>2 (socially-influenced attitudes)</th>
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<tbody>
<tr>
<td>Athletes who care about their team will try to play with injuries and pain</td>
<td>.805</td>
<td></td>
</tr>
<tr>
<td>No pain, no gain</td>
<td>.764</td>
<td></td>
</tr>
<tr>
<td>Athletes will do everything possible to play despite injuries and pain</td>
<td>.772</td>
<td></td>
</tr>
<tr>
<td>Athletes should tough it out with an injury or pain today and not worry about the effects tomorrow</td>
<td>.709</td>
<td></td>
</tr>
<tr>
<td>Every athlete should expect to have to play with an injury or pain sometime</td>
<td>.699</td>
<td></td>
</tr>
<tr>
<td>Athletes should ignore the pain</td>
<td>.689</td>
<td></td>
</tr>
<tr>
<td>Athletes who endure pain and play hurt deserve our respect</td>
<td>.707</td>
<td></td>
</tr>
<tr>
<td>Playing with injuries and pain demonstrates character and courage</td>
<td>.678</td>
<td></td>
</tr>
<tr>
<td>Only athletes understand what it is like to play with injuries and pain</td>
<td>.582</td>
<td>.433</td>
</tr>
<tr>
<td>Teammates are impressed with those who play with injuries and pain</td>
<td></td>
<td>.673</td>
</tr>
<tr>
<td>Teammates make athletes feel guilty if they don’t want to play hurt or with pain</td>
<td>.729</td>
<td></td>
</tr>
<tr>
<td>Teammates only care about players who are healthy and able to play</td>
<td></td>
<td>.827</td>
</tr>
<tr>
<td>Teammates say they don’t want athletes to play with serious injuries, but they actually push them to play if they are needed</td>
<td>.775</td>
<td></td>
</tr>
</tbody>
</table>

Eigenvalue        4.992                        3.194
Total Variance Explained 38.397%              24.571%

N = 126
Table 2.

*Descriptive Statistics for the AIMS, RPIQ Subscale, and Self-Perceived Behavioral Scores*

<table>
<thead>
<tr>
<th>Scale</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
<th>Skewness (S.E.)</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIMS</td>
<td>129</td>
<td>3.99</td>
<td>1.61</td>
<td>1.4-6.8</td>
<td>-.04 (.21)</td>
<td>.92</td>
</tr>
<tr>
<td>RPIQ (Personal)</td>
<td>127</td>
<td>2.56</td>
<td>.72</td>
<td>1.2-4.0</td>
<td>.05 (.21)</td>
<td>.93</td>
</tr>
<tr>
<td>RPIQ (Social)</td>
<td>128</td>
<td>2.36</td>
<td>.79</td>
<td>1.0-4.0</td>
<td>.13 (.21)</td>
<td>.89</td>
</tr>
<tr>
<td>Behavior</td>
<td>130</td>
<td>4.13</td>
<td>1.44</td>
<td>1.0-7.0</td>
<td>.12 (.21)</td>
<td>.89</td>
</tr>
</tbody>
</table>
Table 3.  

*Descriptive Statistics and ANOVA results for RPIQ Subscales and Self-Perceived Behavior Scores as a Factor of Athletic Identity Categorization.*

<table>
<thead>
<tr>
<th>Scales</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>df</th>
<th>F</th>
<th>Tukey’s HSD (p&lt;.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.89 (.48)</td>
<td>2.59 (.58)</td>
<td>3.07 (.66)</td>
<td>2,119</td>
<td>20.87**</td>
<td>High&gt;Mod&gt;Low</td>
</tr>
<tr>
<td>Moderate</td>
<td>n=29</td>
<td>n=60</td>
<td>n=36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.77 (.66)</td>
<td>2.36 (.71)</td>
<td>2.84 (.72)</td>
<td>2,119</td>
<td>6.65*</td>
<td>High&gt;Low</td>
</tr>
<tr>
<td>RPIQ (Social)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviors</td>
<td>3.00 (1.08)</td>
<td>4.20 (1.34)</td>
<td>5.12 (1.13)</td>
<td>2,119</td>
<td>18.95**</td>
<td>High&gt;Mod&gt;Low</td>
</tr>
</tbody>
</table>

*p<.01; **p<.001
Table 4.

Regression Table for Gender, Athletic Identity, and the Personal Attitudes RPIQ Subscale

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td>Gender**</td>
<td>-.467</td>
<td>.163</td>
<td>-.251</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant**</td>
<td>.702</td>
<td>.254</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>.35</td>
<td>.30</td>
</tr>
<tr>
<td>Gender</td>
<td>-.187</td>
<td>.140</td>
<td>-.100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletic Identity***</td>
<td>.456</td>
<td>.060</td>
<td>.567</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant***</td>
<td>-1.548</td>
<td>.364</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05; **p<.01; ***p<.001
### Table 5.

**Regression Table for Gender, Athletic Identity, and the Socially-Influenced Attitudes RPIQ Subscale**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td>-.01</td>
<td>.00</td>
</tr>
<tr>
<td>Gender</td>
<td>-.070</td>
<td>.165</td>
<td>-.038</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>.103</td>
<td>.258</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2***</td>
<td></td>
<td>.12</td>
<td>.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.115</td>
<td>.160</td>
<td>.063</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletic Identity***</td>
<td>.301</td>
<td>.069</td>
<td>.381</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant***</td>
<td>-1.381</td>
<td>.416</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05; **p<.01; ***p<.001
Table 6.

*Regression Table for Gender, Athletic Identity, and the Self-Perceived Behavioral Questionnaire*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender*</td>
<td>-.636</td>
<td>.249</td>
<td>-.221</td>
<td>.04</td>
<td>.05</td>
</tr>
<tr>
<td>Constant***</td>
<td>5.079</td>
<td>.389</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong>*</td>
<td></td>
<td></td>
<td></td>
<td>.35</td>
<td>.32</td>
</tr>
<tr>
<td>Gender</td>
<td>-.194</td>
<td>.212</td>
<td>-.068</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletic Identity*</td>
<td>.722</td>
<td>.091</td>
<td>.582</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant**</td>
<td>1.544</td>
<td>.550</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05; **p<.01; ***p<.001