

# Playing Through Pain and Injury: Psychosocial Considerations

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The purpose of the present investigation was to assess the influence of gender and athletic identity on recreational basketball players' attitudes and behaviors with regard to playing through pain and injury. Participants included 130 male and female intramural basketball players who completed the Athletic Identity Measurement Scale (AIMS), the Risk Pain and Injury Questionnaire (RPIQ), and a scale to measure behavioral tendencies toward playing with injury. Results from MANOVA and hierarchical regression analyses revealed that gender was not a factor in regard to either injury-related attitudes or behavioral tendencies. In contrast, athletic identity was a significant factor. Specifically, athletes who were higher in athletic identity exhibited more positive attitudes toward playing with injury as well as higher behavioral tendencies to do so. Study results are discussed in terms of the sport culture and sport ethic surrounding injury.

**Keywords:** pain, injury, sport, athletic identity, athlete, basketball

Within the context of competitive sport, injuries are typically considered to be expected consequences of participation. These injuries can be categorized as nagging (e.g., groin pull), thus allowing the athlete to continue to participate, or more acute, putting an athlete out of competition for several weeks (e.g., severe ankle sprain). Sometimes these acute injuries can be season-ending (e.g., knee injury) or can even be career ending (i.e., multiple concussions). A number of studies have been conducted to document the prevalence of sport injury. According to Conn, Annett, and Gilchrist (2003), close to 7 million injuries occur each year in sport and recreational settings. In contrast, Williams and Anderson (2007) present a much larger estimate of 25 million people in the United States who are injured each year while participating in a range of sport, exercise, and recreational activities. These contrasting estimates are likely due to differences across studies in how injury is defined, the particular populations studied (e.g., youth sport, high school, college, professional, recreational), and the methodology employed to measure or document injuries. Nevertheless, the fact remains that there are a significant amount of injuries that occur each year in sport and recreational settings.

Injury rates have also been found to differ across sports, with the majority of surveys indicating that basketball and football injuries are most common for

young adult recreational athletes (Conn et al., 2003), high school recreational and competitive athletes (Emery, Meeuwisse, & McAllister, 2006), and NCAA athletes (Agel et al., 2007). These rather consistent findings indicating that football and basketball are often near the top of the list of injury-prone sports are mirrored in athletes' perceptions that these are indeed the sports that involve the greatest risk of injury (Albert, 1999; Gard & Meyenn, 2000).

Despite evidence indicating that football and basketball have what may be the highest injury rates and that athletes are aware of that fact, individuals continue to participate in such sports. To explain this phenomenon, some writers and scholars have cited a sport culture that minimizes the significance of injuries and promotes the idea of playing through pain and injury.

## **The Sport Culture, Pain, and Injury**

A number of qualitative studies have been conducted to examine why athletes choose sports with high injury rates and/or why they accept the risk of injury and play through pain. Howe (2001) interviewed rugby players and found that injuries occur so often in the sport that the athletes simply became accustomed to them (i.e., the injuries become less significant in the minds of these athletes). Similarly, Albert (1999) found that cyclists experience high injury rates and are well aware of the risk for injury, but they described injuries and potential dangers as necessary risks and characteristics of the cycling culture. Acceptance and minimization of pain and injury was also present in the attitudes of female rowers, as shown in a study conducted by Pike and Maguire (2003), who found that the rowers persevered through pain to appear strong in front of teammates and significant others in the audience. Roderick and Waddington (2000) described similar tendencies from their interviews with professional soccer players. Specifically, not only were these players willing to play through their injuries and perceive them as less significant, but they also revealed no significant fear of injury.

A related concept that is also of interest to the current study is the term "sport ethic" (Hughes & Coakley, 1991; Nixon, 1996b). This construct includes the notion that participating in one's sport is a priority that should be held above all else. Those who adopt the sport ethic are not only expected to accept and play through injury, but they must do so without showing any negative effects of the injury. This commitment to a sport ethic was illustrated in a qualitative study conducted by Shaffer (1997) with high school wrestlers who were asked to explain why they decided to participate despite pain and injury. Over half of the answers given by the athletes centered around reaching goals and being successful, meaning that playing through injury was a consequence they were willing to cope with to participate in their sport and to reach their sport goals.

The research conducted to date does suggest that many athletes play through injuries. For example, Nixon (1996b) conducted a survey study with a sample of collegiate athletes and found that 94% claimed that they had played through injury at some point during their sport career. Furthermore, research studies have found that athletes who display a strong dedication toward their sport in the face of pain and injury are more likely to be accepted into their sport by coaches (Malcom, 2006), teammates (Malcom, 2006; Nixon, 1994), experts (Albert, 1999), and the media (Nixon, 1993). Of these social agents, coaches may perhaps exert the greatest

influence on athletes in terms of playing with pain. In this regard, a study by Nixon (1994) found that coaches held the belief that athletes who played through injury deserved the most respect. Furthermore, these coaches also expressed the notion that athletes have to accept the risk of injury if they are to be successful in their sport. In addition, of course, the media has become a progressively greater influence due to more frequent stories that not only commend, but also hold up as exemplars, those athletes who play through injury (Nixon, 1993). More recent research (Deroche, Woodman, Stephan, Brewer, & Le Scanff, 2011; Howe, 2004; Loland, Skirstad, & Waddington, 2006) has revealed that the pressures to play with pain and injury have increased in recent years with all the media attention and money associated with winning.

It seems possible, then, that the context within which competitive sport occurs provides a culture that encourages athletes to develop attitudes, beliefs, and values regarding the continuation of their sport participation despite the presence of pain and injury. Yet, there are some athletes who do not choose to do so. What is it that might distinguish those who do play through pain and injury versus those who do not? One factor that may be related to this choice is athletic identity.

## **Athletic Identity and Playing Through Pain and Injury**

Athletic identity has been defined as the degree to which individuals identify with the athlete role (Brewer, Van Raalte, & Linder, 1993). Specifically, individuals who exhibit high levels of athletic identity define themselves primarily in terms of their athletic status, and they place great importance on their success or failure in the athletic realm. A few studies have been conducted that provide some evidence of the potential link between athletic identity and athletes' decisions to play through pain and injury. Gard and Meyenn (2000) interviewed a sample of boys with the primary intent of finding out what activities and movements these boys preferred. During the course of the interviews, the researchers discovered that injury played a central role in the participants' attitudes toward particular types of activities. Specifically, the responses of the boys indicated that they wanted to show a masculine identity to others. Therefore, they chose sports that presented higher risks and more physical contact so that they could exhibit and internalize such an identity.

Roderick and Waddington (2000) presented similar results in their interviews with professional soccer players. These athletes revealed that some of the reasons they would play through injuries centered around a fear of losing their role, their frustrations with not being able to play, and their desire to play in more important games. The researchers associated all of these reasons with the participants' strong identification as an athlete. A more direct connection between athletic identity and injury was evident in a study conducted by Thomas and Rintala (1989), who found that athletes who cannot play their sport due to injury may lose a sense of who they are, and they may feel like they are alienated from their world. In fact, many athletes have been found to outright deny any negative long-term consequences of injury. For example, athletes in one study (Walk, 1997) reported that they felt so strongly about the negative consequences of playing through injury that they were willing to sign a waiver taking full responsibility for their actions and potential consequences just so they could continue to play. The results of these studies

suggest that it may be extremely important to some athletes to be able to play through injury. Thus, any subsequent consequences are less meaningful than the benefits of practicing and playing.

Based on the research studies reviewed above, it seems possible that athletes who hold the highest levels of athletic identity would be those who would exhibit the strongest attitudes and behavioral tendencies to play through pain and injury, while athletes with lower levels of athletic identity may be less apt to do so. Yet despite these initial findings, the direct link between athletic identity and athletes' attitudes and behaviors toward playing through pain and injury has not yet been examined. Thus, the primary purpose of the current study was to examine this connection. A second aspect of this study was to determine whether athletes' gender would interact with athletic identity to affect their attitudes and behaviors regarding pain and injury.

## Gender and Playing Through Pain and Injury

Much of the identity research previously presented in relation to athletes' attitudes toward injury described this link in terms of a "masculine" identity (Curry, 1993; Gard & Meyenn, 2000; Liston, Reacher, Smith, & Waddington, 2006; Malcom, 2006; Young, 1997). However, recent research suggests that such an identity (or, maybe, the desire for such an identity) is not specific to males or masculine ways of thinking. That is, female athletes appear to adopt similar values involving the minimization of injury (Malcom, 2006; Pike & Maguire, 2003; Young, 1997). This was demonstrated in Malcom's study which incorporated the use of participant observation procedures with a girls' softball team to determine if females are likely to play through injury and, if so, when this socialization process occurs. Results indicated that although the girls may not have gone into the sport with intentions of playing through pain, they were soon minimizing injury, making fun of others who demonstrated pain, and playing after occurrences that were later described as painful. Similarly, Young (1997), interviewed adult females who played in sports perceived as masculine in nature, and found that the females were just as likely as males to minimize injury, mock others who were hurt, and show bravery in the face of injury risk. Furthermore, many of the female athletes who were interviewed described a closing of the gap between females and males in terms of pain and injury perception, with some athletes indicating that female athletes did not, in fact, differ from male athletes.

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. The results showed that two-thirds of the 200 female respondents said it is necessary to take risks and minimize pain within the sport of rowing. 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 as presenting "masculine" characteristics.

Despite the previous study findings indicating that male and female athletes may exhibit very similar attitudes and reactions to playing through pain and injury, there could potentially be some differences in *degree*. Nixon (1996a) found this through interviews with collegiate male and female athletes. His results revealed that male athletes exhibited higher levels of tolerance for playing through pain and

injury than did female athletes. Thus, gender differences in attitudes and behaviors related to playing through pain and injury could possibly be a matter of degree. That is, both male and female athletes may exhibit very similar, or the same, attitudes and behaviors, but males might endorse such attitudes and behaviors to a greater degree.

## The Current Study

In general, then, previous theory and research has suggested that there is perhaps a sport culture and sport ethic that minimizes and normalizes the risk of pain and injury through participation in sport. Furthermore, athletes who play through pain and injury and who exhibit the strongest attitudes about this concept are often glorified. Within this culture, then, many athletes appear to have accepted and adopted these attitudes. The purpose of the current study, therefore, is to determine whether athletes' attitudes and behavioral intentions regarding playing through pain and injury differ as a function of their level of athletic identity and their gender. Because much of the previous research on playing through pain and injury has been conducted with elite athletes, the current study focuses on a different population—those who are competing in a recreational basketball league.

Based on previous theory and research, it was hypothesized that recreational basketball players with higher levels of athletic identity would exhibit more positive attitudes toward playing through pain and injury and higher scores on self-reported behavioral tendencies to do so as compared with recreational basketball players with lower levels of athletic identity. It was also hypothesized that a significant gender main effect would be found, indicating that male recreational basketball players would exhibit more positive attitudes toward playing through pain and injury and higher scores on behavioral tendencies to do so as compared with female recreational basketball players.

## Method

### Participants

Participants for this study consisted of 130 recreational basketball players (68 male and 62 female) who were current participants in one of three intramural basketball leagues at a midsized university in the Midwestern United States. Specifically, these participants were members of teams that were involved in: male only ( $n = 40$ ), female only ( $n = 35$ ), and coed ( $n = 55$ ) intramural basketball leagues. Participants ranged in age from 18 to 24 years ( $M = 20.03$ ;  $SD = 1.60$ ). There were 29 (22.3%) freshmen, 35 (26.9%) sophomores, 30 (23.1%) juniors, 29 (22.3%) seniors, and one graduate student (.8%); six participants did not specify academic level. None of the study's participants were involved in intercollegiate basketball, nor were they members of any other intercollegiate sports. Thus, all could be categorized as recreational athletes. In regard to previous basketball experience, 38.5% of them reported that they had played basketball in high school, and the sample, as a whole, reported an average of 6.64 years ( $SD = 3.98$ ) of basketball playing experience (at the youth sport, high school, or intramural level). Only 19 individuals (14.6%) reported no previous basketball playing experience. In response to questions concerning previous sport injuries, a large number of the study's participants ( $n = 97$ ) reported

that they had experienced injuries, and the mean number of injuries was 4.05 ( $SD = 4.00$ ). It may be important to note that this score exhibited some positive skew (+1.68). Furthermore, examination of the distribution revealed that the majority of the participants who reported previous sport injury fell within a range from one to five previous sport injuries. However, there were some individuals who reported larger numbers of previous sport injuries (6–20), thus causing the positive skew.

## Operational Definition

In studies conducted to examine participants' attitudes toward and behavioral intentions regarding playing through pain and injury, it is critical to define for participants exactly what it means for them to play through injury. It is important to note, for example, that playing *through* injury is different from playing *after* injury. For the current study, the definition of pain/injury provided by Chen and colleagues (Chen, Williams, Fitness, & Newton, 2008) was used. Their definition stated that pain/injury is that which "gets people's attention, alerts them to a threat to their well-being, and motivates them to take remedial action" (p. 78). Based on this definition, playing through injury was defined in the current study as participating while still feeling pain so that (a) the pain/injury needs some sort of mental attention during participation; (b) the pain/injury involves 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 participation should and/or would be initiated and continued during the experience of pain/injury. This definition was provided to participants within the directions for the self-perceived behavioral questionnaire so as to provide consistency across study participants in understanding the term "playing through injury."

## Instrumentation

To assess the variables of interest, a series of self-report questionnaires were employed.

**Demographic questionnaire.** A questionnaire was administered to obtain basic demographic information from study participants. Specifically, questionnaire items assessed participants' age, gender, academic year, type of intramural league in which they participated, years of basketball experience, highest level of basketball competition, and hours of basketball played each week. In addition, the number and type of previous injuries were also assessed.

**Athletic identity.** The Athletic Identity Measurement Scale (AIMS) was employed to measure the degree to which study participants endorsed their identity as an athlete. The original version of this scale was developed by Brewer, Van Raalte, and Linder (1993) and consists of 10 items intended to measure the strength and exclusivity of a person's identity as an athlete. The response format consists of a 7-point Likert-type scale with anchors ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In their initial set of studies, Brewer and colleagues found that the AIMS exhibited construct, convergent, and discriminant validity. Furthermore, internal consistency coefficients ranged from .81 to .93, and test-retest reliability was found to be .89 across a 14-day period.

Although the AIMS was initially developed and tested for reliability and validity as a unidimensional scale (Brewer et al., 1993), the results of subsequent studies (e.g., Hale, James, & Stambulova, 1999) questioned that unidimensional assumption. Brewer and Cornelius (2001) examined this issue using a large, diverse sample that included 2,856 participants from a wide variety of sport populations. The results of their model testing revealed that a higher order hierarchical model best fit the data. Specifically, three items were eliminated from the original 10-item scale, and the remaining seven items were divided into three subscales (representing three first-order factors). The first subscale identified as Social Identity, whereas items on it reflect the extent to which respondents view themselves as occupying socially recognized athlete roles. The second subscale, Exclusivity, represents the degree to which individuals' self-worth and identity is determined only by their performance in the athlete role. Finally, the third subscale, Negative Affectivity, reflects the extent to which individuals experience negative affect in response to undesirable outcomes in the athletic domain. Brewer and Cornelius also found support for one higher order factor, a more global athletic identity construct.

For the current study, a total AIMS score was computed by averaging across the seven items identified by Brewer and Cornelius (2001). In addition, however, three subscale scores were also computed to represent the three first order factors demonstrated by Brewer and Cornelius. Assessment of the internal consistency of these four scores was conducted using Cronbach's alpha. Obtained coefficients were .90 for the total Aims scale, and .87, .89, and .76, respectively, for the three subscales of Social Identity, Exclusivity, and Negative Affectivity.

***Risk of Pain and Injury Questionnaire (RPIQ).*** To assess participants' attitudes concerning sport risk, pain, and playing through injury, the RPIQ was used. This instrument was initially developed by Nixon (1994, 1996a) and consisted of 31 items that were divided into three subscales. However, in 2005, Walk and Wiersma found this 31-item scale to have low construct validity. Thus, they created a newer version with only 13 items that contained a similar three-subscale structure to that identified by Nixon. These three subscales include (a) Tough (items reflect the athlete's endorsement of toughness with regard to risk, pain, and injury in sport); (b) Social Role Choice (items assess athlete's calculated willingness to accept risk, pain, and injury in sport as part of their athletic role); and (c) Pressed (items reflect athlete's perceptions of pressure exerted by others to play with pain and injury). Walk and Wiersma found that this 13-item questionnaire had higher face and construct validity than did the original questionnaire.

For the current study, this newer version of the RPIQ was used; however, some small modifications were needed. Specifically, in the RPIQ used by Walk and Wiersma (2005), the word "coaches" was used on some of the items in the Pressed subscale. Because intramural teams typically do not have coaches, the word "coaches" was replaced by the term "teammates" for this study. As an example of these revisions, for one of the RPIQ items phrased "coaches are impressed with those who play with injuries and pain," the version used in the current study was worded "teammates are impressed with those who play with injuries and pain." For each of the 13 items, respondents were asked to select the response that best represented their attitudes as a recreational basketball player. Consistent with the Walk and Wiersma scale, the response format for the current study was set up as

a 4-point Likert-type scale with responses ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Assessment of the internal consistency of this scale for the current sample was conducted using Cronbach's alpha analyses, and coefficients of .89 were obtained for each of the three subscales.

**Perceived injury behavior.** To assess participants' perceptions regarding their behavioral intentions to play through injury, three questions were used. These questions asked participants to indicate (a) whether they had played basketball through pain and injury, (b) whether they currently play basketball through pain and injury, and (c) whether they expect to play through pain and injury in the future. A Likert-type response format was used with scores ranging from 1 (*almost never*) to 7 (*almost always*). Participants' responses to these three items were summed and divided by three to get a single score. Assessment of the internal consistency of these three items revealed a sufficiently high coefficient (.89). In the current study, then, recreational basketball players' behavioral tendencies to play through pain and injury were assessed using perceived behaviors (or behavioral intentions) rather than through assessment of actual behavior. This is consistent with procedures used in previous injury studies (e.g., Kress & Statler, 2007; Liston, Reacher, Smith, & Waddington, 2006) due to the difficulty of collecting behavioral data regarding reasons for playing with injury.

## Procedures

Following Institutional Review Board approval, participation recruitment began by contacting the director of intramurals to obtain the names of intramural basketball team captains. Captains were then contacted via either e-mail or phone and asked if they would be willing to assist in contacting members of their team to participate in the study. Any team member could choose not to participate, and individuals were automatically disqualified if they indicated that they had ever played a varsity sport at the collegiate level. Recruitment of participants also occurred on-site at the basketball games. That is, players were approached to see if they were willing to participate in a study investigating attitudes toward playing through injury.

A table was set up at the site of the intramural basketball games where participants could complete the packet of questionnaires. An informed consent form (approved by the Institutional Review Board) was first completed before questionnaires were handed out. Then, the other questionnaires were completed and participants were thanked for their participation.

## Statistical Analyses

Descriptive statistics were calculated and inspected for linearity and normality. Preliminary analyses were conducted to determine if participants' scores on any of the study variables differed as a function of the type of intramural league in which they participated (men only, women only, coeducational) and to assess the degree of association between participants' self-reported behavioral tendencies to play through pain and injury and their attitudes toward pain and injury (RPIQ subscale scores). Finally, to assess the main study purpose, multivariate analysis of variance (MANOVA) and hierarchical regression analyses were conducted.



## Results

### Descriptive Results

Means, standard deviations, and range scores for all study variables were calculated and are presented in Table 1. As these data show, the mean scores for the AIMS total scale as well as for the three first order subscales were either at the midpoint (4.0 on a 7-point scale) or just above or below that value. Similarly, the three subscale means from the RPIQ were right around the midpoint (2.5 on a 4-point scale). Finally, the mean value for this sample of recreational athletes on the perceived injury behavior scale was, again, right around the midpoint (4.0 on a 7-point scale). Examination of the standard deviation and range scores did suggest much interindividual variability (i.e., obtained scores were mostly spread across the entire possible score range). All data shown in Table 1 were inspected for normality. Results indicated that data were normally distributed (i.e., skewness scores did not exceed  $\pm 1.00$ ).

**Table 1 Descriptive Data for All Study Variables**

Variable	Mean ( <i>SD</i> )	Possible Score Range	Obtained Score Range
AIMS Total Score	4.15 (1.21)	1–7	1.43–6.86
AIMS: Social ID	4.44 (1.28)	1–7	1.67–7.00
AIMS: Exclusivity	3.67 (1.56)	1–7	1.00–7.00
AIMS: Neg Affectivity	4.19 (1.37)	1–7	1.50–7.00
RPIQ: Toughness	2.50 (.76)	1–4	1.00–4.00
RPIQ: Social Role Choice	2.58 (.77)	1–4	1.00–4.00
RPIQ: Pressed	2.34 (.79)	1–4	1.00–4.00
Perceived Injury Behavior	4.13 (1.44)	1–7	1.00–7.00

*Note.* AIMS = Athletic Identity Measurement Scale; RPIQ = Revised Pain and Injury Questionnaire.

### Preliminary Analyses

Because the study's participants were drawn from three different types of intramural leagues (all men, all women, and coeducational), a one-way MANOVA was conducted to determine if participants' scores on the study variables might differ as a function of the league in which they participated. The independent variable for this analysis was type of league and the dependent variables included all relevant study variables (three AIMS subscale scores, three RPIQ subscale scores, and the single score from the perceived injury behavior scale). The results from this analysis revealed a nonsignificant main effect ( $p > .05$ ) for league type, indicating that participants' scores on this set of variables did not differ as a function of the intramural league in which they participated.

To determine whether study participants' behavioral tendencies regarding playing through pain and injury were related to their attitudes toward injury (RPIQ

subscale scores), a series of univariate correlations were conducted. These results revealed that participants' perceived behavioral tendencies or intentions to play through pain and injury were significantly ( $p < .00$ ) and positively correlated with all three subscales from the RPIQ ( $r = .60$  for RPIQ: Tough,  $.58$  for RPIQ: Social Role Choice, and  $.49$  for RPIQ: Pressed). Thus, recreational athletes' attitudes and perceived behavioral tendencies toward playing with pain appear to be moderately related.

## Main Analyses

The primary purpose of the current study was to determine if recreational basketball athletes' attitudes and perceived behavior with regard to playing with pain and injury would differ as a function of their gender and level of athletic identity. To examine this study purpose, two different statistical procedures were conducted. First, a group comparisons approach was used to determine if male and female athletes who were high, moderate, or low in athletic identity differed on their attitudes and behaviors with regard to playing through pain and injury. Second, regression analyses were used. The results of these procedures are presented below.

## Group Comparison Analysis

A  $2 \times 3$  (Athlete Gender  $\times$  Athletic Identity Group) MANOVA was conducted. The dependent variables included the three subscale scores from the RPIQ (Tough, Social Role Choice, and Pressed) and the single score representing athletes' perceived behavioral tendencies to play through pain and injury. The first independent variable was athlete gender. The second independent variable was athletes' level of athletic identity (low, moderate, and high). To obtain the three athletic identity groups, participants' scores on the total AIMS were used to divide them into three groups based on percentile scores. Those in the low athletic identity group were those whose total AIMS score was at or below the 25th percentile for the sample of participants (a score of 3.14 on the 7-point AIMS). Those in the moderate group were those whose AIMS score was between the 25th and the 75th percentiles, and those classified in the high group were the athletes whose AIMS score put them into the 75th percentile or above (a score of 5.00 or higher on the 7-point AIMS). This procedure is consistent with that used by previous researchers in identifying or classifying individuals into contrasting groups using a continuously based score (e.g., Lantz & Schroeder, 1999; McCallum, Zhang, Preacher, & Rucker, 2002).

The results of the  $2 \times 3$  (Athlete Gender  $\times$  Athletic Identity Group) MANOVA revealed a nonsignificant gender by athletic identity interaction effect ( $p = .92$ ), as well as a nonsignificant athlete gender main effect ( $p = .46$ ). However, a significant main effect for athletic identity was found, Wilk's  $\lambda = .58$ ,  $F(8, 242) = 9.44$ ,  $p < .00$ ,  $\eta^2 = .24$ . Examination of the parameter estimates as well as the univariate  $F$ -values (see Table 2) for this significant main effect revealed that the three athletic identity groups differed on all four of the dependent variables. Post hoc means comparison testing revealed that the three groups differed significantly from each other on all four dependent variables. That is, for the three RPIQ subscale scores as well as for the single perceived behavioral tendencies score, the athletes who exhibited the

**Table 2 Follow-up Results for the Significant Athletic Identity Group Main Effect**

Dependent Variable	Group 1: Low Athletic Identity ( <i>n</i> = 35)	Group 2: Moderate Athletic Identity ( <i>n</i> = 57)	Group 3: High Athletic Identity ( <i>n</i> = 38)	Univ <i>F</i> -value ( <i>df</i> = 2, 124)	$\eta^2$	Post hoc Means Comparison Results
	1.94 (.59)	2.50 (.66)	3.01 (.68)			
RPIQ: Tough	1.87 (.54)	2.66 (.61)	3.11 (.65)	19.33*	.24	3 > 2 > 1*
RPIQ: Social Role Choice	1.78 (.66)	2.35 (.69)	2.86 (.70)	31.92*	.34	3 > 2 > 1*
RPIQ: Pressed	2.96 (1.04)	4.22 (1.32)	5.09 (1.15)	18.37*	.23	3 > 2 > 1*
Perceived Injury Behavior				21.47*	.26	3 > 2 > 1*

\**p* < .00.

highest levels of athletic identity (75th percentile and above) indicated significantly higher or more positive attitudes toward playing through pain and injury and also revealed higher behavioral tendencies to do so than did the athletes in either of the other two groups. In addition, the moderate athletic identity group (those scoring between the 25th and 75th percentiles on the AIMS) indicated significantly higher attitudes and behavioral tendencies to play through pain and injury than did the athletes in the lowest athletic identity group (below the 25th percentile).

## Regression Analyses

The results of the MANOVA analyses presented in the previous section indicate that athletes who vary in level of athletic identity (low, moderate, and high) do differ in their attitudes and behaviors toward playing with pain and injury. However, this analysis was conducted by dividing the 130 recreational basketball athletes into three groups based on their total or overall AIMS score. Because the AIMS scale does produce a continuous rather than a categorical score and because the AIMS does appear to have three first order factors (Brewer & Cornelius, 2001), a second analysis was conducted to test the main study purpose using regression rather than group comparisons procedures (i.e., to determine whether athletes' attitudes and behavior toward playing with pain and injury could be predicted by both gender and the three subcomponents of the AIMS). Because some researchers (e.g., Tasiemski, Kennedy, Gardner, & Blaikley, 2004; Wiechman & Williams, 1997) have found gender differences on the AIMS, a preliminary one-way MANOVA was conducted to determine if there were gender differences in the current sample. The independent variable for this analysis was athlete gender, and the dependent variables were the three AIMS subscale scores (Social Identity, Exclusivity, and Negative Affectivity). The results of this analysis did reveal a significant gender main effect, Wilk's  $\lambda = .90$ ,  $F(3, 126) = 4.81$ ,  $p < .00$ ,  $\eta^2 = .10$ . Examination of the parameter estimates and univariate  $F$ -values indicated that male and female athletes differed significantly on all three of the AIMS subscales (see Table 3), with males scoring higher than females.

Due to the gender differences in athletes' scores on the AIMS subscales, the predictive relationship between the AIMS subscale scores and athletes' attitudes and perceived injury behavior were examined using hierarchical regression procedures. Specifically, four hierarchical regression analyses were conducted to determine the impact of gender and athletic identity on the three subscales from the RPIQ and the one perceived behavioral tendencies score. For each of these analyses,

**Table 3 Follow-Up Gender Main Effect**

Dependent Variable	Male Athletes ( $n = 68$ )	Female Athletes ( $n = 62$ )	Univ $F$ -value ( $df = 1,128$ )	$\eta^2$
AIMS: Social Identity	4.82 (1.20)	4.03 (1.24)	13.82**	.10
AIMS: Exclusivity	4.01 (1.60)	3.31 (1.44)	6.86**	.05
AIMS: Neg Affectivity	4.45 (1.23)	3.90 (1.48)	5.28*	.04

\* $p < .05$ ; \*\* $p < .01$ .

gender was entered as a predictor at Step 1 followed by the three AIMS subscales as predictors at Step 2.

The results of these four hierarchical regression analyses are summarized in Table 4. Examination of the results for the predictive effects of the three AIMS subscales, while controlling for gender, on the first RPIQ subscale (Tough) revealed that when gender was entered alone (Step 1), it was a significant predictor of athletes' scores on the tough subscale,  $F(1, 128) = 7.83, p < .01$ . However, only 6% of the variance in the tough subscale could be predicted by gender alone. When the three AIMS subscales were added (Step 2) as predictors, they significantly improved the prediction equation ( $R^2$  change = .40,  $p < .00$ ). Furthermore, when the beta coefficients from the entire model were examined, gender and the first AIMS subscale, Social Identity, were not significant predictors; however, the second and third AIMS subscales, Exclusivity and Negative Affectivity, were both positive and significant predictors of athletes' scores on the Tough subscale. This full model was significant,  $F(4, 125) = 26.33, p < .00$  with an  $R^2$  value of .46, indicating a large effect size (Cohen, 1988).

Similar results were found in the hierarchical regression analysis to predict athletes' scores on the second subscale from the RPIQ (Social Role Choice; Table 4). That is, gender, when entered alone, was a significant predictor of Social Role Choice,  $F(1, 128) = 4.61, p < .04$ . But, the  $R^2$  change (.42) that resulted when the three AIMS subscales were added to the regression equation at Step 2 indicated that the AIMS subscales contributed a significant amount to the prediction of athletes' scores on the Social Role Choice subscale above and beyond that explained by gender alone. Furthermore, when the full model was examined, the beta weights for gender and social identity were not significant. But, Exclusivity and Negative Affectivity were both positive and significant predictors of Social Role Choice. The full model for the prediction of RPIQ rational choice was significant,  $F(4, 125) = 25.79, p < .00$ , with  $R^2 = .45$ , indicating a large effect.

For the third RPIQ subscale of Pressed, gender was not a significant predictor at Step 1 ( $p = .21$ ). At Step 2, the addition of the three AIMS subscales revealed a significant change in  $R^2$  (.31). Again, in the full model, the beta weights for gender and the AIMS Identity subscale were not significant, but the two AIMS subscales (Exclusivity and Negative Affectivity) were positive and significant predictors of the RPIQ Pressed subscale. This full model was significant,  $F(4, 125) = 14.95, p < .00$ , with  $R^2 = .32$ , a medium effect.

Finally, for the prediction of perceived injury behavioral tendencies, gender was significant at Step 1,  $F(1, 128) = 6.40, p < .01$ ; however, gender disappeared as a predictor when the three AIMS subscales were added to the equation at Step 2 (change in  $R^2 = .39$ ). This full model was significant,  $F(4, 125) = 23.87, p < .00$ , with an  $R^2$  value of .43, indicating a large effect. Interestingly, examination of the beta weights for the full model indicated that the only significant predictor of athletes' behavioral tendencies was the Negative Affectivity subscale.

In summary, then, the results of this series of hierarchical regression equations revealed that two of the AIMS subscales (Exclusivity, and particularly, Negative Affectivity) were significant predictors of athletes' attitudes toward and behavioral tendencies with regard to playing with pain and injury. In contrast, athletes' gender was not found to be a significant predictor once the Athletic Identity subscale scores were entered into the prediction equation.

**Table 4 Hierarchical Regression: Prediction of RPIQ and Perceived Behavior Using Gender and AIMS Subscales**

Dependent Variable	Step	Predictor(s) Entered	$\beta$	R <sup>2</sup>	$\Delta R^2$	$\Delta F$
RPIQ: Tough	Step 1	Gender	-.24**	.06	.06**	7.83**
	Step 2	All Predictors			.40**	30.69**
		Gender	-.12			
		AIMS: Social ID	-.13			
		AIMS: Exclusivity	.21*			
		AIMS: Neg Affect	.58**			
RPIQ: Social Role Choice	Step 1	Gender	-.19*	.04	.04*	4.61*
	Step 2	All Predictors			.42**	31.74**
		Gender	-.03			
		AIMS: Social ID	.03			
		AIMS: Exclusivity	.19*			
		AIMS: Neg Affect	.50**			
RPIQ: Pressed	Step 1	Gender	-.11	.01	.01	1.57
	Step 2	All Predictors			.31**	19.19**
		Gender	.00			
		AIMS: Social ID	-.10			
		AIMS: Exclusivity	.21*			
		AIMS: Neg Affect	.49**			
Perceived Injury Behavior	Step 1	Gender	-.22*	.05	.05*	6.40*
	Step 2	All Predictors			.39**	28.33**
		Gender	-.09			
		AIMS: Social ID	-.06			
		AIMS: Exclusivity	.15			
		AIMS: Neg Affect	.58**			

Note. *df* for Step 1 = 1, 128; *df* for Step 2 = 3, 125.

\* $p < .05$ . \*\* $p < .01$ .

## Discussion

This study was conducted to determine whether athletic identity and gender would affect or determine recreational basketball players' attitudes and perceived behaviors with regard to playing through pain and injury. The results provide support for the importance of athletic identity. However, no support was found for gender as a factor that would explain variability in injury attitudes or perceived behavior.

## Athletic Identity

The results from the MANOVA that was conducted to compare individuals who were classified as high (75th percentile and above), moderate (between 25th and 75th percentiles), or low (below 25th percentile) in athletic identity revealed that those scoring in the high group exhibited significantly higher and more positive attitudes and behavioral intentions toward playing through pain and injury than did their peers who were in the moderate or low groups. Furthermore, those in the moderate group scored significantly higher on the RPIQ and behavioral intention scales than did the low group.

These MANOVA results were not only replicated but also amplified in the results obtained from the subsequently conducted regression analyses. In particular, the regression analyses examined the degree to which the AIMS subscales (rather than the total AIMS score used in the previously discussed MANOVA) could predict study participants' attitudes and behaviors toward pain and injury. These results indicated that it was actually two of the AIMS subscales (Exclusivity and Negative Affectivity) that were significant predictors of the RPIQ subscales, and only the Negative Affectivity subscale that predicted athletes' perceived behavioral tendencies. In contrast, the Social Identity subscale from the AIMS was not related to the RPIQ subscales or to the behavioral score.

In general, these results indicating that athletic identity is significantly related to athletes' injury attitudes and behaviors are consistent with previous literature that has examined the sport culture and sport ethic. That literature suggests that athletes participate within a sport culture that often encourages ignoring and normalizing injury, because injury is often perceived to be a risk that athletes must take to succeed in sport (Albert, 1999; Nixon, 1993; Roderick & Waddington, 2000). Within this sport culture, athletes are also exposed to the sport ethic, which commonly embodies the 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).

It is particularly interesting that a strong relationship was found in this study between participants' levels of athletic identity and their positive attitudes and behavioral tendencies regarding pain and injury because the athletes in this study were not elite level competitors. Rather, they were recreational athletes who were current participants in a university-based recreational (intramural) basketball league. Despite this lower competitive level, there still were individuals within this sample who exhibited higher levels of athletic identity and who strongly endorsed the idea of playing through pain and injury. It seems, then, that one does not have to be an elite athlete to be part of the sport culture in which it is common to play through pain and injury.

As noted in the results section, the MANOVA procedures classified study participants based on their total or overall AIMS score. However, the hierarchical regression analyses were conducted to use the three previously identified subscales from the AIMS. These results revealed that two of the subdimensions of the overall AIMS were particularly predictive of athletes' injury attitudes and behaviors. Specifically, the Social Identity Subscale (measuring the degree to which respondents view themselves as athletes) did not predict athletes' scores on any of the injury attitude or behavior scales. However, the Exclusivity subscale (which measures the degree to which respondents perceive that their self-worth and identity are

determined only or primarily by their athlete role) was a significant predictor of all three of the attitude subscales from the RPIQ. These results indicate that recreational basketball players who identify almost exclusively with the athletic role exhibit more positive attitudes toward playing with pain and injury. Furthermore, the Negative Affectivity subscale (which measures the degree to which respondents experience negative affect when they encounter undesirable outcomes in sport) was a significant predictor of all three injury attitude scales and was also the only significant predictor of athletes' self-reported behavioral tendencies to play through pain and injury. These results are interesting, as they suggest that simply identifying oneself as an athlete (high scores on the Social Identity subscale) does not affect or predict injury attitudes and behaviors. Rather, having an exclusive (or mostly exclusive) identity as an athlete and experiencing negative affect when unable to perform well does appear to serve as a determinant of one's tendencies to play through pain and injury.

## Gender

This study was also designed to assess the possibility that recreational basketball athletes' attitudes and behaviors toward playing through pain and injury would differ as a function of their gender; however, the results from the MANOVA revealed a nonsignificant gender main effect. Furthermore, the results from the four hierarchical regression analyses indicated that gender was not a significant predictor of the RPIQ and behavioral intentions measures once the scores from the three AIMS subscales were included in the regression equation. Previous research (Malcom, 2006; Young, 1997; Young et al., 1994) has suggested that females are socialized into their sports in ways that are very similar to that of males. Thus, it may not be surprising that females who participate in competitive sport activities end up with similar attitudes to their male counterparts regarding the notion of playing with pain and injury.

The lack of significant gender differences in this study provides further support for the gender similarities hypothesis espoused by Hyde (2005) on the basis of results from a large meta-analysis that revealed very few actual gender differences among a range of psychological constructs. In her article, Hyde argued that many researchers tend to search for gender differences when examining various psychological constructs, but her analysis of effect sizes revealed that most of them were in the near-zero or small range. Given these results from the meta-analysis, Hyde concluded that males and females are psychologically more similar than different. In a recent chapter, Gill and Kamphoff (2010) presented an argument for the same conclusion when it comes to variables in the sport psychology field (i.e., it appears that males and females are psychologically more similar than different in sport contexts). The results of the current study are consistent with that argument.

## Limitations and Future Research Directions

There were some limitations to the current study. First, the sample was from a relatively small number of students at a university in the Midwestern United States, which underscores that generalizations to other populations should be made with caution. Second, self-report data were used in the present investigation, and therefore, the transfer to actual behavior may not be completely accurate (although



there was a significant correlation between self-perceived behaviors and attitudes toward injury). Third, not enough participants answered the question “Why have you chosen to play with pain and injury in the past?” and thus no inferences could be drawn from this question.

Regarding future research, it is important to determine exactly *why* some recreational athletes perceive that playing through pain is so important. Data suggest that many athletes feel pressure from teammates and significant others (even if simply perceived) to play, but the question then becomes why they believe this is so important to them. Perhaps the reward of winning, which appears minimal given the potential cost of further injury (maybe even long term injury), might actually be greater than originally thought. Secondly, there are many levels of “recreational athletes,” and further research investigating these different levels would be informative rather than simply classifying everyone who is not a varsity performer as a recreational performer. Third, from a developmental perspective, important questions may be (a) When do these attitudes toward playing with injury develop? (b) What specific experiences foster the development of these positive attitudes toward injury? and (c) Who are the individuals most responsible for this orientation? Finally, the influence of gender on playing through pain and injury is still not confirmed, possibly due the quickly changing roles of women in sport and the expectations that go along with their increased participation and levels of competitiveness. Perhaps there are many more similarities than differences between the genders regarding attitudes toward playing through pain and injury. These important questions await investigation.

## Conclusions

The present investigation extended the literature on playing with pain to recreational athletes, a population that certainly may be much larger than the intercollegiate population. Generally, results revealed that the sport culture of playing with pain and injury exists even at this level. Second, it appears that athletic identity is an important variable regarding playing with pain at the recreational level. Individuals higher in athletic identity had more positive attitudes and reported a higher level of willingness to play through pain than did those lower in athletic identity.

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