

2013

Longitudinal analysis of perceived body image, sport commitment, burnout, and athletic injury

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LONGITUDINAL ANALYSIS OF PERCEIVED BODY IMAGE, SPORT
COMMITMENT, BURNOUT, AND ATHLETIC INJURY

An Abstract of a Thesis
Submitted
in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Erik Chaouch
University of Northern Iowa
August 2013

ABSTRACT

Injury is a risk that all athletes face while participating in sport. How injuries affect athletes perceived body image, sport commitment levels, and burnout levels are not yet fully understood. Athletes are aware of what the media portrays an athlete as, aware of what peers think an athlete should look like, and even have their own pre-conceived notions as to what an athlete's body should look like. Many athletes perceive their bodies to be appropriate for their sport, yet there is dissatisfaction with their own bodies in the context of what is socially considered to be attractive. A distorted body image may possibly lead to an eating disorder. Body image is the subjective picture or mental image on one's own body. To date, no research has examined the role of injury and how it affects an athletes body image.

The sport commitment model was developed to explain factors related to continued motivation for participation in sport or physical activity. Sport commitment is defined as the "desire and resolve to continue participation." Very little previous research has examined the role of injury and sport commitment levels.

Burnout can be defined as a psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels. Very few studies have specifically examined the connection between an injury and resulting burnout syndrome.

The purpose of this study was to examine the relationship of injury on the perceived body image, sport commitment, and burnout levels of athletes from a

longitudinal perspective. A total of 285 athletes were examined over an academic year on their perceived body image, sport commitment, and burnout.

No significant differences emerged between injured and non-injured athletes for perceived body image and sport commitment. However, injured athletes did report greater emotional/physical exhaustion and reduced sense of accomplishment than did non-injured athletes at Time 1.

In regards to changes over time, none of the athletes had significant changes over time, none of the athletes had significant changes in perceived body image across the academic year regardless of injury status. In contrast, all athletes did have a significant decrease in sport commitment from Time 1 to Time 3. Additionally, injured athletes did have a significant decrease in perceptions of reduced accomplishment, and an increase in perceived devaluation of sport. Lastly, for the athletes that sustained an injury during the course of the study, no significant changes occurred in regards to body image, sport commitment, and burnout from Time 1 to Time 2 and from Time 2 to Time 3.

Future research should be conducted to examine the trends related to perceived body image when injury occurs. Research should also explore the possible link between injury and body image, specifically the contributing factors to perceived body image (e.g., perfectionism, exercise dependence, & perceived loss of control). Future research should replicate and extend the current study to include additional predictors of burnout and commitment. Future research should also examine potential factors that influence sport commitment over time.

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APPROVAL PAGE

This Study by: Erik Chaouch

Entitled: Longitudinal Analysis of Perceived Body Image, Sport Commitment, Burnout,
and Athletic Injury

has been approved as meeting the thesis requirement for the

Degree of Athletic Training Master's of Science

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ACKNOWLEDGEMENTS

First and foremost, I would like to thank Dr. Windee Weiss for her guidance and leadership. Without her tireless efforts, I would not be in the same place. I would like to thank the rest of my committee, Dr. Peter Neibert and Dr. Kelli Snyder for their advice and assistance. I would also like to thank my dedicated crew of Andrew Vereen, Steph Pudenz, Bridgit Sturch, and Pam Hosto for their hard work in collecting and entering data. Lastly, I would like to thank my family for their constant support and encouragement to keep going.

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CHAPTER 1

STUDY 1: BODY IMAGE & INJURY

Introduction

Injury is an inherent risk for all athletes participating in sport. The impact that injuries have on athletes psychologically and emotionally is not fully understood. More specifically, how injuries may affect athletes' perceived body image is relatively unexplored. Many athletes perceive that their bodies need to look a certain way to be considered an elite athlete or to be successful in sport (DeBruin, 2010). It may be possible that suffering an injury can change an athlete's perceived body image.

Wiese-Bjornstal, Smith, LaMott, Shaffer, and Morrey (1998) developed a theoretical post-injury model that examines the athlete's psychological reaction to being injured. The Wiese-Bjornstal psychological reaction to injury model details the factors that influence how an athlete responds to being injured. This model suggests that there are three ways in which an athlete's psychological reaction to injury can be displayed: appraisal, emotional response, and behavioral response.

According to this theoretical model, an injury is considered a stimulus that must be interpreted by the athlete (Wiese-Bjornstal et al., 1998). Many different factors combine to form how an athlete interprets what has happened (i.e., the injury). Each individual athlete has his or her own personal factors that contribute to how the athlete reacts to the stressor, such as prior experiences of injury, emotional responses, trait anxiety, self-esteem, and coping skills (Wiese-Bjornstal et al., 1998). Several situational factors also contribute to how the athlete cognitively appraises injury. Situational factors

include: type and severity of the injury, sport, starter status, time of season, teammate and coach influences, and family dynamics. Both personal and situational factors play a role in the cognitive appraisal of the injury, or how the athlete interprets the injury. The cognitive appraisal of the athlete then influences how the athlete responds emotionally and behaviorally. Emotional responses could include fear, anger, frustration, and guilt. The cognitive appraisal also affects the athlete's behavioral response. For example, the athlete may put forth less effort during rehab, start missing rehabilitation sessions, or choose to partake in risk-taking behaviors (Wiese-Bjornstal et al., 1998).

Based on this psychological reaction to injury model, a variety of personal factors (e.g., self-perceptions, body image) and situational factors (e.g., time of season, playing status) could influence the way injured athletes cognitively appraise injury (Wiese-Bjornstal et al., 1998). In turn, the way in which athletes cognitively appraise injury influences the emotional and behavioral reactions. This model can help in the athletic training profession by raising awareness to the psychological reactions of athletes when injured. Potentially, some of the personal and situational factors could be modified, and clinicians may be able to introduce an intervention to break the athlete out of the vicious cycle that may occur once injured. One personal factor in particular that may influence how an athlete cognitively appraises an injury is self-perceptions, specifically body image. However, the effect of injury on perceived body image has yet to be examined.

Body image is defined as “the mental image a person has of his or her physical appearance, as well as any positive or negative feelings one has about his or her body shape or size” (DeBruin, 2010, pg. 11-12). Many athletes perceive that their bodies need

to look a certain way to be considered an elite athlete or to be successful in their sport (Follo, 2007). Athletes today face difficult challenges about body perceptions (Krane, Waldron, Michalenok, & Stiles-Shipley 2001). Athletes are aware of how the media portrays athletes, aware of what peers think an athlete should look like, and even have their own pre-conceived notions as to how an athlete's body should look (Loland, 1999). Many athletes perceive their bodies to be appropriate for their sport, yet there is dissatisfaction with their bodies in the context of what is socially considered to be attractive (Follo, 2007).

Interestingly, a number of studies have shown that both male and female athletes report having multiple, separate body images, such as an athletic body image and a social body image (DeBruin, Oudejans, Bakker, & Woertman, 2011; Follo, 2007; Krane et al., 2001; Loland, 1999; Russell, 2004). The athletic body image has been defined as "the internal image one has of his or her body and the evaluation of that image within an athletic context," whereas social body image has been defined as "body evaluation in the context of daily life" (Greenleaf, 2002, p. 64).

The athletic body image is an evaluation of one's body in comparison to the athlete's sport. Secondly, social body image compares their body to what society deems to be beautiful and attractive. Studies have shown that just by being an athlete may lead to higher risks of distorted body image and potentially engaging in disordered eating behaviors (Jacobi, Hayward, DeZwaan, Kraemer & Agras, 2004). One possible risk factor could be the athlete's identity as an elite athlete (DeBruin, Oudejans, & Bakker 2007; Follo, 2007; Loland, 1999).

A meta-analysis by Jacobi et al. (2004) examined the risk factors for eating disorders. Results of the analysis identified athletic competition as increasing risk for developing an eating disorder. Research has also linked perfectionism, a perceived loss of control, exercise dependence, and fat phobia to injury (Crawford & Ecklund, 1994; Hewitt, Flett, & Edinger, 1995; Hurst, Hale, Smith, & Collins, 2000; Marchant, Levy, & Clough, 2005). A commonly held belief about individuals with eating disorders is the self-imposed feeling that they must do everything perfectly (Hewitt et al., 1995). Perfectionism is a personality trait frequently associated with unrealistic standards for physical attractiveness and thinness, and for athlete's unrealistic standards about what they perceive an elite athlete should look like (Krane et al., 2001).

Exercise dependence is also a possible underlying cause to a disturbed body image in an injured athlete (Marchant et al., 2005). Exercise dependence can be defined as a process that compels an individual to exercise in spite of obstacles, and results in physical and psychological symptoms when exercise is withdrawn (Hurst et al., 2000). When an injury occurs, there may be a perceived loss of control; the athlete has no choice, but to sit on the sideline. With this perceived loss of control, loss of physical activity due to injury, and the potential to be perfectionistic, perhaps injured athletes are at risk for negative changes in perceived body images. The motivation to be successful and the quest to perfection may lead to exercise dependence or distorted body image in athletes (Marchant et al., 2005).

Therefore, the purpose of this study was to examine the relationship between perceived body image and injury from a longitudinal perspective. The first purpose of

this study was to examine change over time in perceived body image. The second purpose of the study was to examine changes in perceived body image due to injury. It was hypothesized that sustaining an injury would lead to a lower perceived body image. The final purpose of the study was to examine differences between athletes who are injured versus those who were not injured on perceived body image.

Methods

Participants

At Time 1, a total of 285 participants completed measures for this study, with 49 participants reporting being injured at Time 1. Athletes were classified as “injured” if their injury required them to have limited participation for a minimum of 7 days. Thus, approximately 83% of the Time 1 sample reported not being injured. The sample was predominately Caucasian (88%) while the remaining participants described themselves as African American (7%), Hispanic (1%), Asian (1%), and Biracial (1%). Male ($n = 145$) and female ($n = 140$) athletes had a mean age of 19.69 years ($SD = 1.35$).

Participants were involved with one of the following teams: tennis (2%), women’s basketball (3%), women’s golf (4%), men’s basketball (5%), men’s golf (6%), softball (6%), women’s soccer (10%), women’s swimming and diving (10%), men’s track and field/cross country (12%), wrestling (12%), women’s track and field/cross country (13%), and football (17%). The majority of the participants identified themselves as a starter (55%), with the remaining participants identifying themselves as nonstarters (29%), or red shirt/medical hardship (14%). The participants ranged in NCAA eligibility status from freshman through seniors (84%), red shirt/medical hardship (9%), and 5th

year seniors (6%). Participants were currently participating in the regular season (51%), preseason (27%), the off-season (19%), and post-season/playoffs (3%).

Through the course of the study, 10 individuals that participated in Time 1 sustained new injuries that were included for Time 2 based on the inclusion criteria for injury. The injured participants identified themselves as male ($n = 8$) and female ($n = 2$) athletes that ranged in age from 19 to 22 ($M = 20.3$, $SD = 1.34$). Injured athletes identified themselves as: starters (60%) with the remaining identifying themselves as either non-starters (20%) or redshirt/medical hardships (20%). At Time 3, a total of 215 of the original 285 participants completed the measures (male, $n = 99$; female, $n = 116$).

Measures

Questionnaires were approved for use by the IRB. The questionnaire was designed to assess body image perceptions. Demographic data was also collected including: age, gender, sport, year of eligibility, starter status, time of season, and ethnicity.

Body Image. In order to assess an athlete's perceived body image, a set of twelve questions was used. The Social Physique Anxiety Scale (SPAS), developed by Hart, Leary, and Rejeski (1989), assesses the level of anxiety an individual experiences when others may be evaluating their physique. This scale has been widely tested on a variety of participants including: men (e.g., Davis, Brewer, & Weinstein, 1993), women (e.g., Eklund & Crawford, 1994), young (e.g., McAuley & Burman, 1993), and middle aged individuals (e.g., McAuley, Bane, Rudolph, & Lox, 1995). The SPAS has been tested and shown to be reliable and valid (Crawford & Eklund, 1994; Eklund, Mack, & Hart, 1996)

with reliability alpha levels ranging from .81 to .90. A 5-point Likert scale was used for responses ranging from 1 “not at all” to 5 “very much so.” An example of a body image question is, “I wish I wasn’t so uptight about my body.”

Injury. Injury was defined as a physical ailment that occurs during practice, competition, or work-outs that limits an athlete’s participation for at least 7 days.

Procedures

Following approval from the Institutional Review Board, the researcher contacted the head coaches of the Division I sport teams seeking cooperation with participant recruitment. At a team meeting, the primary researcher described the study and involvement criteria to potential participants. Then, participants were asked to read and sign the consent form, after which the participants completed the questionnaire.

A Time 1 questionnaire was completed by the participants to establish baseline levels of perceived body image. During the course of the study, the researcher was in contact with the head certified athletic trainer of each sport regarding the injury status of all participating athletes. The researcher met with an athlete a second time if an injury occurred to an athlete that caused the athlete to not participate or have limited participation for at least 7 days. The injured athlete was asked to complete the same questionnaire (i. e., Time 2 data point). The injured athlete was asked to complete the Time 2 questionnaire at the projected midpoint of the rehabilitation process.

Lastly, the primary researcher arranged another meeting where the participants could complete the final questionnaire (Time 3, late April 2013). All questionnaires were matched, the names were removed, and each packet was assigned an identification code.

Data Analysis

Following data collection, data was entered using the SPSS statistics program. Preliminary analysis included: descriptives, frequencies, and reliabilities for all scales. First, in order to determine if a difference existed between injured and non-injured athletes on perceived body image at Time 1, an analysis of variance (ANOVA) was conducted.

Second, in order to determine if perceived body image was dynamic and changes over time, a paired samples *t*-test was used. The data was split based on the participants' injury status at Time 1 – injured and non-injured. Then, separate *t*-tests were conducted to determine if perceived body image changed from Time 1 to Time 3 for each group.

Third, for the 10 individuals that sustained an injury during the course of the study, two paired sample *t*-tests were conducted: Time 1 to Time 2, then Time 2 to Time 3. This would allow for analyses of changes in perceived body image from healthy to injured to healthy status. All analyses used $p < .05$ to determine significance.

Results

Scale Reliabilities

Alpha coefficients were computed to determine scale reliability for body image. The measure demonstrated good reliability with alphas of .90 at Time 1, .91 at Time 2, and .90 at Time 3.

Differences in Perceived Body Image

An ANOVA was conducted to determine if there was a difference in perceived body image between injured athletes and non-injured athletes at Time 1. The ANOVA

was not significant: $F(1,283) = .04, p = .85$. Thus, injured and non-injured athletes did not differ on perceptions of body image.

Change in Perceived Body Image Over Time

A t -test was used to determine if there was a change over time in perceived body image for both injured and non-injured athletes. The sample was split into two groups: injured and non-injured. For the injured athletes, the paired samples t -test was not significant, thus the injured athletes did not experience a significant change in perceived body image from Time 1 ($M = 3.82, SE = .13$) to Time 3 ($M = 3.75, SE = .12, t(33) = .65, p = .52$). For the non-injured athletes, the paired samples t -test was also not significant, therefore the non-injured athletes did not experience a change in perceived body image from Time 1 ($M = 3.86, SE = .06$) to Time 3 ($M = 3.94, SE = .06, t(179) = -1.75, p = .08$).

Changes Over Time Due to Injury

A paired samples t -test was used to determine if there was a change in perceived body image from Time 1 to Time 2, and from Time 2 to Time 3, for the 10 athletes that sustained new injuries. The paired samples t -test was not significant from Time 1 ($M = 3.84, SE = .27$) to Time 2 ($M = 3.72, SE = .28, t(9) = .27, p = .79$) showing there was not a significant change between the athletes' Time 1 perceived body image (i. e., healthy) and Time 2 perceived body image (i. e., injured).

The paired samples t -test was also not significant from Time 2 ($M = 3.43, SE = .33$) to Time 3 ($M = 3.85, SE = .35, t(6) = -1.25, p = .26$) indicating an injured athlete's perceived body image at Time 2 did not significantly change to Time 3 at the end of the

year. The results do suggest there are slight fluctuations indicating there may be trends over time or due to injury in perceived body image, this is represented in Figure 1.

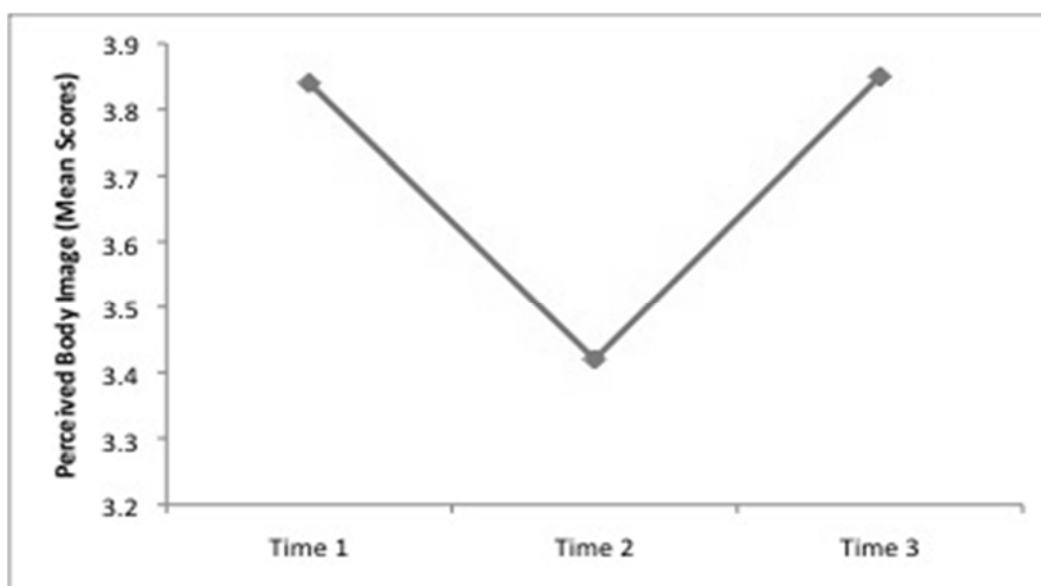


Figure 1. Changes in Perceived Body Image Due to Time and Injury

Discussion

The purpose of the study was to examine the relationship between perceived body image and injury from a longitudinal perspective for injured and non-injured athletes. There were no significant differences noted, however clear trends developed. Results showed that as an athlete suffered an injury through the course of their season, a negative shift occurred in their perceived body image. As the athlete became healthy again and returned to play, their perceived body image also “recovered” and returned back to pre-injury levels. It is possible that as an athlete sustains an injury, they start to feel as if

being inactive for any period of time will result in weight gain from a forced sedentary lifestyle change in order to heal resulting in a negative body image perception. As the athlete becomes healthy again and returns to play, they no longer feel inactive and no longer consider the notion they have become sedentary. Further research should be conducted to examine these trends.

The trends shown in Figure 1 demonstrate that when an athlete was injured, their perceived body image became slightly more negative. This may be as a result of the athlete perceiving their body not fitting preconceived notions as to how an elite athlete should look. This is in agreement with previous research that athletes perceive their body should look a certain way and are aware of perceptions of what an elite athlete should look like (Follo, 2007; Krane et al., 2001; Loland, 1999).

This downward trend in perceived body image could put an athlete at greater risk for experimenting with disordered eating practices. Athletes are already at risk for developing eating disorders (Jacobi et al., 2004). The link between injury and perceived body image had yet to be examined. Other factors have also been shown to play a role in regards to perceived body image, such as perfectionism, exercise dependence, and a perceived loss of control that contribute to creating a perception of what an elite athlete should look like (Crawford & Ecklund, 1994; Hewitt et al., 1995; Hurst et al., 2000; Krane et al., 2001; Marchant et al., 2005), and when injured this perception may become altered. Therefore, the results of this study should be considered when examining risk factors of eating disorders in athletes. Perhaps future research should explore these links between perfectionism, loss of control, injury, and perceived body image.

Limitations of the present study include the small injury sample size and time of year. Unfortunately, there was not a large number of injuries that occurred during the season that fit our criteria for inclusion into the injured group. This may have resulted from too strict of a definition for injury. The study was started near the end of the fall season, thus we potentially missed a large number of injured athletes through the first portion of the sport season. Future research could examine if perceived body image differs uniquely within each sport. Changes in perceived athletic body image versus social body image changes could also be examined more closely.

In conclusion, perceived body image did not differ between injured and non-injured athletes. There were trends that developed implying that when an athlete is injured, perceived body image becomes more negative. Then, as the athlete becomes healthy again, perceived body image returns back to pre-injury levels. Further investigation into the trends should look further into the change.

REFERENCES

- Crawford, S., Ecklund, R. C. (1994). Social physique anxiety, reasons for exercise, and attitudes toward exercise setting. *Journal of Sport & Exercise Psychology, 16*, 70-82.
- Davis, C., Brewer, H., & Weinstein, M. (1993). A study of appearance anxiety in young men. *Social Behavior and Personality, 21*, 63-74.
- DeBruin, A.P. (2010). *Thin is going to win? Disordered eating in sport*. (Doctoral thesis, VU University, Amsterdam, The Netherlands). Retrieved from http://www.researchgate.net/publication/225151993_Weight-Related_Sport_Motives_and_Girls_Body_Image_Weight_Control_Behaviors_and_Self-Esteem/file/9fcfd510a578e93869.pdf
- DeBruin, A. P., Oudejans, R. R., & Bakker, F. C. (2007). Dieting and body image in aesthetic sports: A comparison of Dutch female gymnasts and non-aesthetic sport participants. *Psychology of Sport and Exercise, 8*, 507-520.
- DeBruin, A. P., Oudejans, R. R., Bakker, F. C., & Woertman, L. (2011). Contextual body image and athletes' disordered eating: The contribution of athletic body image to disordered eating in high performance women athletes. *European Eating Disorders Review, 19*, 201-215.
- Ecklund, R. C., & Crawford, S. (1994). Active women, social physique anxiety, and exercise. *Journal of Sport and Exercise Psychology, 16*, 431-448.
- Ecklund, R. C., Mack, D., & Hart, E. (1996). Factorial validity of the social physique anxiety scale for females. *Journal of Sport and Exercise Psychology, 18*, 281-295.
- Follo, G. (2007). The social and sporting body: Women in rugby and martial arts perceiving their body. *Abstracts of the 3rd Annual 2007 The Drake Conference*, Cleveland State University, (Cleveland, OH).

- Greenleaf, C. (2002). Athletic body image: Exploratory interviews with former female competitive athletes. *Women in Sport and Physical Activity Journal*, *11*, 63-88.
- Hart, E., Leary, M. R., & Rejeski, W. J. (1989). The measurement of social physique anxiety. *Journal of Sport & Exercise Psychology*, *11*, 94-104.
- Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitude characteristics, and symptoms. *International Journal of Eating Disorders*, *18*, 317-326.
- Hurst, R., Hale, B., Smith, D., & Collins, D. (2000). Exercise dependence, social physique anxiety, and social support in experienced and inexperienced bodybuilders and weightlifters. *British Journal of Sports Medicine*, *34*, 431-435.
- Jacobi, C., Hayward, C., DeZwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: Application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin*, *130* (1), 19-65.
- Krane, V., Waldron, J. J., Michalenok, J., & Stiles-ShIPLEY, J. (2001). Body image concerns in female exercisers and athletes: A feminine culture studies perspective. *Women in Sport and Physical Activity Journal*, *10*, 17-54.
- Loland, N. W. (1999). Some contradictions and tensions in elite sportsmen's attitudes towards their bodies. *International Review for the Sociology of Sport*, *34*, 291-302.
- Marchant, D, Levy, A, & Clough, P. (2005) Exercise dependence and fat phobia: Pilot data. BASES Annual Conference, Loughborough.
- McAuley, E., Bane, S. M., Rudolph, D. L., & Lox, C. L. (1995). Physique anxiety and exercise in middle-aged adults. *Journal of Gerontology*, *50B*, 229-235.
- McAuley, E., & Burman, G. (1993). The social physique anxiety scale: Construct validity in adolescent females. *Medicine and Science in Sports and Exercise*, *25*, 319-328.

Russell, K. M. (2004). On versus off the pitch: The transiency of body satisfaction among female rugby players, cricketers, and netballers. *Sex Roles, 9*, 561-574.

Wiese-Bjornstal, D. M., Smith, A. M., Shaffer, S. M., & Morrey, M. A. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of Applied Sport Psychology, 10*, 46-69.

CHAPTER 2

STUDY 2: SPORT COMMITMENT, BURNOUT, AND INJURY

Introduction

Injury is a risk that all athletes encounter while participating in sport. However, the affect of injuries on athletes' sport commitment and burnout levels are not fully understood. Theoretical models have suggested that the onset of an athletic injury could lead to changes in athletes' motivation, psychological processes, and emotional responses (e.g. Wiese-Bjornstal, Smith, LaMott, Shaffer, & Morrey, 1998). Thus, sport commitment and burnout may change based on how an athlete responds to injury (i.e., psychological and emotional responses).

The sport commitment model was developed to explain factors related to continued motivation for participation in sport or physical activity (Scanlan, Simons, Carpenter, Schmidt, & Keeler, 1993). Sport commitment is defined as the "desire and resolve to continue participation" (Scanlan, et al. , 1993, p.6). The sport commitment model was based on the argument that enjoyment, or fun, is a primary participation motive regardless of age, ethnicity, gender, and sport (Scanlan & Lewthwaite, 1986).

Scanlan and Simons (1992) identified three important features of the sport commitment model. First, sport commitment addresses the psychological attachment to an activity. Second, sport commitment is a product of both cognitive and affective factors. Third, the sport commitment model is able to distinguish differing psychological states of participants who may report equal levels of commitment. Sport commitment

examines the meaning behind continued involvement and commitment that individuals have for the activities in which they participate (Scanlan & Simons, 1992).

The sport commitment model suggests that certain constructs predict the level and type of commitment an athlete experiences: enjoyment, personal investments, involvement opportunities, attractive alternatives, social constraints, and social support (Scanlan et al., 1993). Enjoyment has been the strongest predictor of sport commitment (Scanlan et al., 1993; Weiss & Weiss, 2003). Enjoyment refers to an athlete's feelings of pleasure (e. g., fun). Personal investments are the resources the athlete puts into their sport that they cannot get back (e. g., time, money) if they were to quit participating. Involvement opportunities are positive factors associated with participating in sport (e. g., apparel, being part of a team). Attractive alternatives refers to other activities, sports, and interests the athlete may have which can distract them or look more favorable than participating in their current sport. Social constraints refers to the athlete feeling that they have to continue participation in sport as to not let down their parents, friends, or teammates, whereas social support is the positive feedback received by others as a result of participating in sport (i. e., fan support).

Another way to explore commitment in the sport context is to consider various types of commitment. Schmidt and Stein (1991) proposed that different types of commitment exist. They suggested that athletes who are committed to sport because of attraction reasons tend to perceive greater benefits, enjoyment, investments, and lower costs and attractive alternatives associated with participation in their sport. In contrast, athletes who are committed to sport because of entrapment reasons would perceive lower

enjoyment, benefits, and attractive alternatives and higher costs and investments associated with their participation in sport.

Research examining commitment and commitment types has shown fairly consistent results (Raedeke, 1997; Weiss & Weiss, 2006). Enjoyment, investments, benefits, and social support tend to be related to higher commitment, whereas higher attractive alternatives, and costs have been related to lower commitment (Scanlan et al., 1993; Weiss & Weiss, 2003). Additionally, research exploring commitment types have shown that not only are athletes committed for attraction-based and entrapment-based reasons, but also that these athletes differ in their perceptions of burnout (Raedeke, 1997) and training behaviors (Weiss & Weiss, 2003).

Studies have examined the link between burnout and the sport commitment perspective (Raedeke, 1997; Schmidt & Stein, 1991). Burnout is defined as “a psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels” (Raedeke, 1997). In addition to the loss of emotional and physical energy commonly experienced due to the intense demands of training and competing, athlete burnout implies a negative assessment of the self and sport (Raedeke, Granzyk, & Warren, 2000). Athletes are more likely to experience burnout if they are involved in sport for mainly entrapment reasons. Raedeke (1997) showed that athletes who exhibited characteristics reflecting the entrapment group of the sport commitment perspective had higher burnout scores than athletes who were in the attracted group.

Early warning signs may indicate that an athlete is at risk for developing burnout. For example, nagging disappointment might be an early warning sign of the risk of impending burnout, and enduring negative mood shifts would be classified as a symptom of emotional exhaustion (Cresswell & Ecklund, 2004). Athlete burnout has been suggested to be the result of a negative shift in motivation (Gould, Udry, Tuffey, & Loehr, 1996). Higher motivation and personal investments could lead to greater stress. Failing to cope with the stress can lead to negative outcomes with the athlete, and over time, can eventually lead to the athlete experiencing physical and psychological disengagement (Smith, 1986). The combination of increased training loads, restricted time for adequate recovery, and increased competitive stress, thereby increases the risk for burnout among athletes (Gould & Diffenbach, 2002).

Raedeke, Lunney, and Venables (2002) examined coaches' viewpoints in order to identify points of convergence and divergence between coaches' perspectives and academic definitions of athlete burnout to define signs and symptoms of burnout. Four primary dimensions were identified: withdrawal, reduced sense of accomplishment, physical, and psychological exhaustion, and devaluation of sport. Outside pressures such as time demands, performance demands, pressure from parents, coaches, and friends, pressure to win and overtraining stress, were all highly related to an increase in athlete burnout. Athlete entrapment, or a feeling of being forced to participate in sport, was also identified as another reason for athlete burnout. These feelings arose from the athlete's perceptions that they no longer had control of their sport participation (Raedeke et al., 2002). Raedeke (1997) examined athlete burnout as it relates to commitment. A sample

of 236 swimmers completed questionnaires to assess commitment and burnout. Athletes who exhibited high sport entrapment also scored higher in burnout scores. Swimmers who were classified as “enthusiastic” swimmers had the highest enjoyment related to swimming, thus they also scored the lowest on burnout.

Perhaps the onset of an athletic injury could act as a stimulus to increase perceptions of burnout and decrease commitment. It is possible that due to an injury, sport commitment and burnout may change. From a sport commitment perspective, perhaps enjoyment and benefits would decrease, perceived costs and attractive alternatives may both increase, and social support and constraints may change during the time of injury and rehabilitation, thus altering an athlete’s sport commitment. Johnston and Carroll (2000) explored the effects of injury and how an injury impacts an athlete’s psychological state. They noted highly committed athletes expressed more confusion at the end of their rehabilitation because the athlete knows that they are still a long way from attaining their prior sport status. Weiss (2011) investigated athletes of varying types of sport commitment over time and examined the relationship between commitment types and injury. Results showed no significant differences between commitment types with regards to injury occurrence; however, low committed athletes that did sustain an injury were rated as giving forth the least amount of energy and effort during rehabilitation.

Very few studies have specifically examined the connection between an injury and resulting burnout syndrome. Cresswell and Ecklund (2006b) examined athlete burnout over time and the authors noted possible relationships between injury and the key characteristics of athlete burnout. Players who reported more injuries also reported

feelings of reduced accomplishment, physical and emotional exhaustion, and sport devaluation. These findings support previous research in which some tennis and rugby players reported believing injury was strongly linked to their burnout experiences (Cresswell, 2006a; Gould et al., 1996). Grylls and Spittle (2008) examined athlete burnout in Australian athletes who were either currently injured or uninjured. Physical and emotion exhaustion and depersonalization were significantly higher for athletes competing at higher competition levels. The authors noted currently uninjured athletes reported higher burnout scores than injured athletes, suggesting that this might be due to injured athletes “having a break” from sport involvement, and currently uninjured athletes spending more time involved in sport, which increased their physical exhaustion. The data also suggested multiple injuries over a period of time could have a cumulative effect on burnout levels.

Not only is little known about the relationship between injury, commitment, and burnout, but also about the dynamic nature of commitment and burnout over time. Few studies have explored commitment longitudinally (Carpenter & Coleman, 1998; Carpenter & Scanlan, 1998; Weiss & Weiss, 2006) with only one study taking injury into consideration (Weiss, 2011). Carpenter and Scanlan (1998) investigated a longitudinal test of the sport commitment model with high school athletes. Changes in the predictor variables over time were related to changes in commitment. Carpenter and Coleman (1998) conducted a longitudinal investigation of elite youth cricketers’ commitment. The authors found that change over time was significantly predicted by changes in: enjoyment, recognition opportunities, and social opportunities (e.g., making new friends).

Weiss and Weiss (2006) examined whether commitment types change over time and if commitment types differed on level of sport commitment. Commitment types were related to participation behavior one year later, and the vulnerable and entrapped groups were more likely to change type of commitment over time versus the attracted group.

Similar to commitment, few studies have explored changes in burnout longitudinally (Cresswell, 2006a; Cresswell, 2008). Cresswell and Ecklund (2006b) suggested that burnout is dynamic and changing as proposed within the stress based explanations. Past research has not yet fully examined the burnout experience over time. Therefore, the need to monitor burnout across time is important to understand the burnout syndrome in athletes. Additionally, few studies have specifically examined the connection between an injury and resulting burnout syndrome. (Cresswell, 2008; Cresswell & Ecklund, 2006a; Grylls & Spittle, 2008).

Therefore, the purpose of this study was to examine the relationship between injury, sport commitment, and burnout from a longitudinal perspective. The first purpose of this study is to examine change over time in sport commitment and burnout. The second purpose of the study is to examine changes in sport commitment and burnout due to injury. It was hypothesized that sustaining an injury would lead to lower commitment and higher burnout. The final purpose of the study is to examine differences between athletes' who are injured versus those who were not injured on sport commitment and burnout.

Method

Participants

At Time 1, a total of 285 participants completed measures for this study, with 49 participants reporting being injured at Time 1. Athletes were classified as “injured” if their injury required them to have limited participation for a minimum of 7 days.

Approximately 83% of the Time 1 sample reported not being injured. Male ($n = 145$) and female ($n = 140$) athletes had a mean age of 19.69 years ($SD = 1.35$). The sample was predominately Caucasian (88%) while the remaining participants described themselves as African American (7%), Hispanic (1%), Asian (1%), and Biracial (1%).

Participants were involved with one of the following teams: women’s basketball (3%), men’s basketball (5%), women’s soccer (10%), women’s track and field/cross country (13%), men’s track and field/cross country (12%), softball (6%), wrestling (12%), football (17%), women’s swimming and diving (10%), tennis (2%), men’s golf (6%), and women’s golf (4%). The participants ranged in NCAA eligibility status from freshman through seniors (84%), red shirt/medical hardship (9%), and 5th year seniors (6%). The majority of the participants identified themselves as a starter (55%), with the remaining participants identifying themselves as nonstarters (29%), or red shirt/medical hardship (14%). Participants were currently participating in the regular season (51%), preseason (27%), post-season/playoffs (3%), and the off-season (19%).

Through the course of the study, 10 individuals that participated in Time 1 sustained new injuries that fit the injury criteria to be included for Time 2. The injured participants identified themselves as male ($n = 8$) and female ($n = 2$) athletes ranging in

age from 19 to 22 ($M = 20.3$, $SD = 1.34$). Injured athletes identified themselves as primarily starters (60%) with the remaining identifying themselves as either non-starters (20%) or redshirt/medical hardships (20%). At Time 3, a total of 215 of the original 285 participants completed measures (male, $n = 99$, female, $n = 116$).

Measures

Questionnaires were approved for use by the IRB. The questionnaire was designed to assess sport commitment and burnout. Demographic data was also collected including: age, gender, sport, year of eligibility, starter status, time of season, and ethnicity.

Sport Commitment. In order to assess the athletes' level of sport commitment, a set of five questions, developed by Scanlan and colleagues was used (Scanlan et al., 1993). These questions have been used in previous studies and have demonstrated adequate reliability and validity (Weiss, 2011; Weiss & Weiss, 2003, 2006, 2007). A 5-point Likert scale was used, with participants' responses ranging from 1 "not at all" to 5 "very much so." An example of a sport commitment question is, "How dedicated are you to competing in your sport?"

Burnout. In order to assess the athletes' level of burnout, Radeke and Smith (2001) developed the Athlete Burnout Questionnaire (ABQ). Three five-item subscales were used: emotional/physical exhaustion, reduced sense of accomplishment, and devaluation. The findings of Raedeke and Smith supported construct validity and the reliability of the measure ($\alpha = .86-.92$). A 5-point Likert scale was used for participants' responses ranging from 1 "almost never" to 5 "almost always." An example of a reduced

accomplishment burnout question is “I am not achieving much in sport.” An example of an emotional/physical exhaustion burnout question is “I feel overly tired from my sports participation,” whereas “I don’t care as much about my sport performance as I used to” represents an item from the devaluation subscale.

Injury. Injury was defined as a physical ailment that occurs during practice, competition, or work-outs that limits an athlete’s participation for at least 7 days.

Procedures

Following approval from the Institutional Review Board, the researcher contacted the head coaches of the Division I sport teams seeking cooperation with participant recruitment. At a team meeting, the primary researcher described the study and involvement criteria to potential participants. Then, participants were asked to read and sign the consent form after which, the participants completed the questionnaire.

Participants in the study completed the questionnaire at Time 1 to establish baseline levels. During the course of the study, the researcher was in contact with the head certified athletic trainer of each sport regarding injury status of the participating athletes. If an injury occurred to an athlete that caused the athlete to not participate or have limited participation for at least 7 days, the researcher then met with that injured athlete. The injured athlete was asked to complete the same questionnaire (i. e., Time 2 data point). The Time 2 questionnaire was given to the injured athlete at the projected midpoint of the rehabilitation process.

Lastly, a final data collection occurred with the majority of the participants that completed Time 1 data. The primary researcher again arranged a meeting where the

participant could complete the questionnaire (Time 3, late April 2013). All questionnaires were matched, the names were removed, and each packet was assigned an identification code.

Data Analysis

Following data collection, data was entered using the SPSS statistics program. Preliminary analysis included: descriptives, frequencies, reliabilities, and correlations. First, in order to determine if a difference existed between injured and non-injured athletes on sport commitment or burnout at Time 1, separate analysis of variance (ANOVAs) were conducted.

Second, in order to determine if sport commitment and burnout were dynamic and changed over time, a paired samples *t*-test was conducted. The sample was divided into two groups based on their Time 1 injury status: injured and non-injured. Then, separate *t*-tests were conducted to determine if sport commitment or the three subscales of burnout (emotional/physical exhaustion, reduced sense of accomplishment, & devaluation) changed from Time 1 to Time 3 for each group.

Third, in order to determine if differences existed between injured and non-injured athletes on burnout differed at Time 1, a multivariate analysis of variance (MANOVA) was conducted using the split group at Time 1: injured and non-injured.

Results

Scale Reliabilities

Alpha coefficients were computed to determine reliabilities for sport commitment and burnout (physical/emotional exhaustion, devaluation, reduced sense of

accomplishment). Table 1 presents the alpha coefficients for the Time 1 variables. All measures demonstrated good reliability with alphas for sport commitment ranging from .81 to .83 and alphas for burnout ranged from .68 to .94.

Correlations

Correlations were calculated among all Time 1 variables (Table 1). Examination of the correlations revealed that all three subscales of burnout were positively related with each other. The three subscales of burnout were all negatively related with sport commitment. Based on the means, the sample of athletes at Time 1 reported higher sport commitment (scores >4 on a 5 point scale), and lower levels of devaluation and reduced sense of accomplishment (scores <2.5 on 5 point scale).

Table 1.

Time 1 Correlations, means, and standard deviations for sport commitment, and subscales of burnout.

Variables	1	2	3	4
1. Sport Commitment	.81			
2. Emotional/Physical Exhaustion	-.26*	.93		
3. Devaluation	-.64*	.58*	.89	
4. Reduced Accomplishment	-.34*	.49*	.56*	.68
M	4.68	2.74	1.83	2.25
SD	0.51	.92	.86	.78

* $p < .05$ significance

Note: Alpha coefficient for each subscale may be seen along the diagonal

Correlations were calculated among all Time 2 variables (Table 2). Examination of the correlations revealed that all three subscales of burnout were positively correlated with each other. Sport commitment remained moderately negatively related with emotional/physical exhaustion and had a strongly negative relation to reduced sense of accomplishment. Emotional/physical exhaustion was moderately related to reduced sense of accomplishment. Devaluation was weakly related to reduced sense of accomplishment. Based on the means, the sample of athletes at Time 2 reported higher sport commitment (scores > 4 on a 5 point scale), and had lower levels of devaluation and reduced sense of accomplishment (scores < 2.5 on 5 point scale).

Table 2.

Time 2 Correlations, means, and standard deviations for sport commitment, and subscales of burnout.

Variables	1	2	3	4
1. Sport Commitment	.81			
2. Emotional/Physical Exhaustion	-.40	.94		
3. Devaluation	.03	.14	.74	
4. Reduced Accomplishment	-.69*	.47	-.12	.78
M	4.78	2.68	1.62	2.22
SD	.38	1.00	.46	.80

* $p < .05$ significance

Note: Alpha coefficient for each subscale may be seen along the diagonal

Correlations were also calculated among all Time 3 variables (Table 3).

Examination of the correlations revealed that all 3 subscales of burnout were positively related with each other. Sport commitment had moderate negative relation with emotional/physical exhaustion and reduced sense of accomplishment. Commitment had a strong negative relation with devaluation. Devaluation was also strongly negatively related to emotional/physical exhaustion and reduced sense of accomplishment. Based on the means, the sample of athletes at Time 3 reported higher sport commitment (scores > 4 on a 5 point scale), and lower levels of devaluation and reduced sense of accomplishment (scores < 2.5 on 5 point scale).

Table 3.

Time 3 Correlations, means, and standard deviations for sport commitment, and subscales of burnout

Variables	1	2	3	4
1. Sport Commitment	.83			
2. Emotional/Physical Exhaustion	-.30*	.93		
3. Devaluation	-.61*	.65*	.91	
4. Reduced Accomplishment	-.39*	.45*	.62*	.82
M	4.62	2.69	1.99	2.16
SD	.56	.92	.91	.72

* p < .05 significance

Note: Alpha coefficient for each subscale may be seen along the diagonal

Differences Between Injured and Non-Injured

An ANOVA was conducted to determine if there was a difference in sport commitment between injured and non-injured athletes at Time 1. The ANOVA was not significant $F(1, 283) = 2.79, p = .10$. Thus, injured and non-injured athletes did not differ on sport commitment at Time 1.

A MANOVA was conducted to determine if there were any differences between injured and non-injured athletes on the subscales of burnout. The MANOVA was significant: Wilkes' $\lambda = .94, F(3, 281) = 6.50, p < .0001$. The effect size was 6%. Injured and non-injured athletes differed significantly on emotional/physical exhaustion and a reduced sense of accomplishment. Comparison of the means revealed injured participants had significantly higher levels of emotional/physical exhaustion and reduced sense of accomplishment than the non-injured athletes at Time 1.

Table 4.

Means, and standard deviations between injured and non-injured at Time 1.

	Injured (<i>n</i> = 49)		Non-Injured (<i>n</i> = 236)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Commitment	4.80	.33	4.66	.54
Emotional/Physical Exhaustion	2.99*	1.06	2.69	.88
Reduced Sense of Accomplishment	2.66*	.74	2.17	.76
Devaluation	1.99	.80	1.80	.87

* *p* < .05 significance

Note: Alpha coefficient for each subscale may be seen along the diagonal

Changes in Sport Commitment Over Time

A *t*-test was conducted to determine if there was a change over time in sport commitment for both injured and non-injured athletes. The sample was split into two groups: injured and non-injured. For the injured athletes, the *t*-test was significant. Therefore, the initially injured athletes sport commitment significantly decreased from Time 1 (*M* = 4.87, *SE* = .04) to Time 3 (*M* = 4.64, *SE* = .08, $t(33) = 2.65$, $p < .02$, $r = .42$). For the non-injured athletes, the *t*-test was also significant. Thus, the initially non-injured athletes sport commitment significantly decreased from Time 1 (*M* = 4.69, *SE* = .04) to Time 3 (*M* = 4.62, *SE* = .04, $t(179) = 2.03$, $p < .05$, $r = .15$). Thus, overall the entire sample reported significantly lower sport commitment at Time 3 compared to Time 1.

Changes in Burnout Over Time

A *t*-test was also used to determine if there was a change over time in the subscales of burnout for both injured and non-injured athletes. For emotional/physical exhaustion, the injured athletes' *t*-test was not significant from Time 1 ($M = 2.79$, $SE = .17$) to Time 3 ($M = 2.94$, $SE = .18$, $t(33) = -1.30$, $p = .20$, $r = .22$) indicating there was no change in emotional/physical exhaustion for injured athletes. For the non-injured athletes, the *t*-test was also not significant from Time 1 ($M = 2.67$, $SE = .06$) to Time 3 ($M = 2.64$, $SE = .07$, $t(179) = .46$, $p = .64$, $r = .03$). Thus, all athletes' perceptions of emotional/physical exhaustion did not change over time.

For reduced sense of accomplishment, the injured athletes' *t*-test was significant from Time 1 ($M = 2.49$, $SE = .12$) to Time 3 ($M = 2.23$, $SE = .12$, $t(33) = 2.31$, $p < .03$, $r = .37$) Thus, injured athletes' reduced sense of accomplishment significantly decreased from Time 1 to Time 3. For the non-injured athletes, the *t*-test was not significant from Time 1 ($M = 2.11$, $SE = .05$) to Time 3 ($M = 2.14$, $SE = .05$, $t(179) = -.63$, $p = .53$, $r = .05$). Therefore, non-injured athletes' perception of reduced sense of accomplishment did not change over time.

For devaluation, the injured athletes' *t*-test was significant. The injured athletes' perceptions of devaluation significantly increased from Time 1 ($M = 1.80$, $SE = .12$) to Time 3 ($M = 2.29$, $SE = .19$, $t(33) = -3.18$, $p < .004$, $r = .48$). For the non-injured athletes, the *t*-test was also significant. For non-injured athletes, perceptions of devaluation significantly increased from Time 1 ($M = 1.73$, $SE = .06$) to Time 3 ($M = 1.93$, $SE = .06$, $t(179) = -4.14$, $p < .0001$, $r = .30$).

Changes Over Time Due to Injury

Sport Commitment. A paired samples *t*-test was used to determine if there was a change in sport commitment from Time 1 to Time 2, and Time 2 to Time 3 for the 10 athletes that sustained new injuries. The paired samples *t*-test was not significant from Time 1 ($M = 4.74$, $SE = .13$) to Time 2 ($M = 4.78$, $SE = .12$, $t(9) = -.32$, $p = .76$) showing there was not a significant change between the athletes' Time 1 sport commitment (i.e., healthy) and Time 2 sport commitment (i.e., injured). The *t*-test was also not significant from Time 2 ($M = 4.83$, $SE = .17$) to Time 3 ($M = 4.77$, $SE = .17$, $t(5) = 1.00$, $p = .36$). Therefore, there was not a significant change in athletes' sport commitment from Time 2 (i.e., injured) to Time 3 (i.e., healthy).

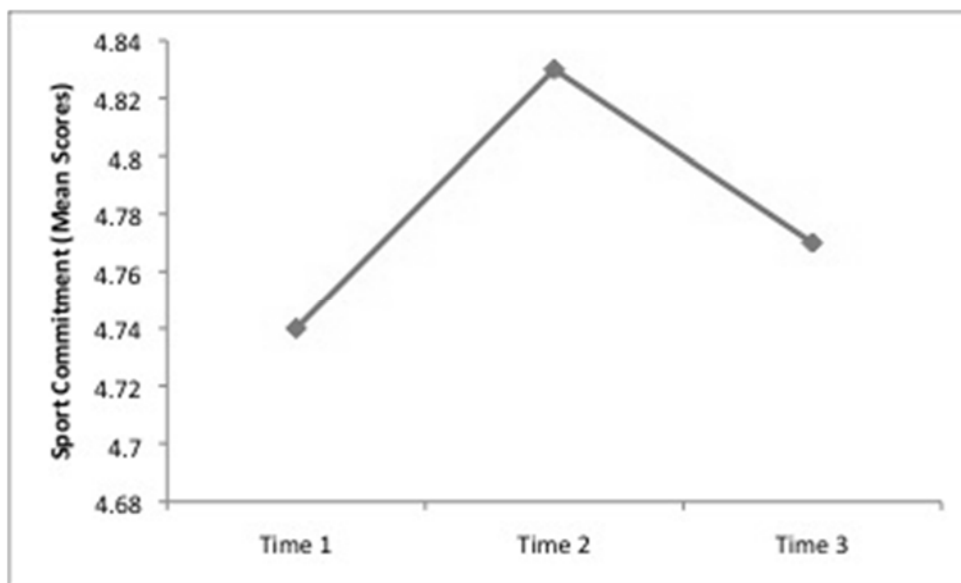


Figure 2. Changes in Sport Commitment Due to Injury

Burnout. A paired samples *t*-test was used to determine if there was a change in the 3 subscales of burnout from Time 1 to Time 2, and Time 2 to Time 3 for the 10 athletes' that sustained new injuries. The paired samples *t*-test for emotional/physical exhaustion was not significant from Time 1 ($M = 2.72, SE = .30$) to Time 2 ($M = 2.68, SE = .32, t(9) = .12, p = .91$). Thus, there was not a significant change between the athletes' Time 1 emotional/physical exhaustion (i.e., healthy) and Time 2 emotional/physical exhaustion (i.e., injured). The paired samples *t*-test was also not significant from Time 2 ($M = 2.51, SE = .19$) to Time 3 ($M = 2.34, SE = .20, t(6) = 1.03, p = .34$) showing there was not a significant change in emotional/physical exhaustion from Time 2 (i.e., injured) to Time 3 (i.e., healthy).

The paired samples *t*-test for reduced sense of accomplishment was not significant from Time 1 ($M = 2.27, SE = .23$) to Time 2 ($M = 2.22, SE = .25, t(9) = .22, p = .83$). Therefore, there was not a significant change in reduced sense of accomplishment subscale in athletes from Time 1 (i.e., healthy) to Time 2 (i.e., injured). The paired samples *t*-test was also not significant for athletes from Time 2 ($M = 2.09, SE = .29$) to Time 3 ($M = 2.14, SE = .32, t(6) = -.18, p = .86$). Therefore, there was not a significant change in the reduced sense of accomplishment subscale between athletes from Time 2 (i.e., injured) to Time 3 (i.e., healthy).

The paired samples *t*-test for devaluation was not significant from Time 1 ($M = 1.72, SE = .13$) to Time 2 ($M = 1.62, SE = .14, t(9) = .75, p = .48$) showing there was not a significant change in athletes' devaluation from Time 1 (i.e., healthy) to Time 2 (i.e., injured). The paired samples *t*-test was also not significant from Time 2 ($M = 1.63, SE =$

.17) to Time 3 ($M = 1.97$, $SE = .20$, $t(6) = -2.30$, $p = .06$). Thus, there was not a significant change in the subscale of devaluation in athletes' from Time 2 (i.e., injured) to Time 3 (i.e., healthy).

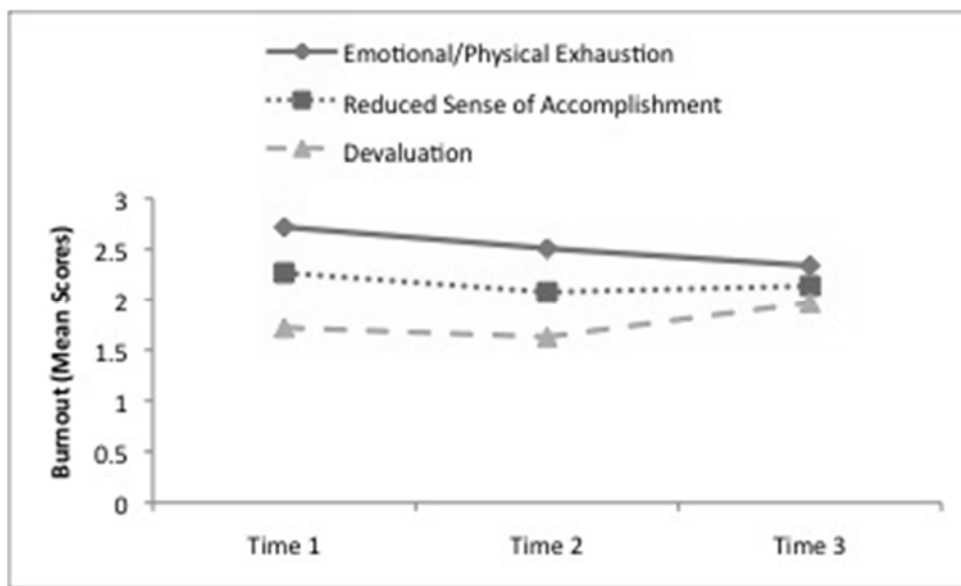


Figure 3. Changes in Burnout Due to Injury

Discussion

The purpose of the study was to examine the relationship between injury, sport commitment, and burnout from a longitudinal perspective for injured and non-injured athletes. This study demonstrated that injured participants had significantly higher levels of emotional/physical exhaustion and reduced sense of accomplishment than the non-injured athletes' at Time 1. The findings suggest that because of an injury, the athlete perceives higher levels of exhaustion and feel as if they are not as successful in their

sport. Whether the injury itself is a cause for the increased exhaustion is a question that could be explored in future research.

Injured and non-injured athletes did not differ in sport commitment levels at Time 1. For both the injured and non-injured athletes, sport commitment significantly decreased from Time 1 to Time 3. It is possible that as the season wore on, the athletes may have been experiencing less enjoyment than at the beginning of the season. Perhaps there were more perceived costs, and less benefits at the end of the competitive season. It is possible that with the Time 3 data collection occurring at the end of the academic year, school demands are increased, thus sport could be seen as a distraction or school is seen as another obligation that leads to decreased commitment. The results support the Carpenter and Scanlan (1998) study that showed a decrease in sport commitment over time. The authors noted an increase in social constraints over time that led to lower sport commitment. Carpenter and Coleman (1998) also found sport commitment over time was influenced by changes in enjoyment, social opportunities (e.g., making new friends). The exact reasons for the changes noted in the current study should be further examined.

The findings showed there was no significant change in sport commitment for the athletes who began the season non-injured and suffered an injury at some point during the season. The findings support Weiss (2011) study that found no significant changes in sport commitment due to injury. However, the findings of this study did have some trends with sport commitment and injury. Commitment increased when the athlete suffered an injury, and then returned to near baseline levels once healthy and returned to play. Johnston and Carroll (2000) suggested committed athletes may add the medical staff as a

source of social support, and might experience greater constraints from coaches and teammates. It is possible that due to injury, social support and social constraints may both increase. The athlete may be getting more support from their peers to return as well as feeling obligated that a return to play is necessary as to not let down teammates and coaches. The exact reasons why the sport commitment trends occurred should be studied more thoroughly in future studies.

Perceptions of emotional/physical exhaustion did not significantly change from Time 1 to Time 3 for either the injured or non-injured participants. However, perceptions of reduced sense of accomplishment was significantly decreased for the injured group from Time 1 to Time 3, but not for the non-injured group. Perhaps athletes that were injured at the beginning of the season felt they were not achieving sport goals or meeting expectations. But by the end of the season once they have returned to play these formerly injured athletes are feeling better about their sport endeavors and performance. Interestingly, both groups of athletes reported significant increases in perceived devaluation in their sport over time. It may be possible that as the year goes on, other things such as schoolwork become more important to the athletes, resulting in a higher devaluation of sport.

For the athletes that sustained an injury during the course of the study, there were no significant changes in their burnout perceptions. However, interesting trends did develop depending on which aspect of burnout was being addressed. For example, emotional/physical exhaustion slightly decreased at each data point, which may be a result of the injury causing a physical break from sport thereby giving the athlete “a

break” from sport. The reduced sense of accomplishment subscale remained constant through each of the three data points. Devaluation of sport slightly increased from injured to healthy, which may be related again to other things (e.g., schoolwork) becoming more important at the end of the school year. These trends support previous research in which some athletes reported injury was strongly linked to their burnout experiences (Cresswell, 2008; Gould et al., 1996). Cresswell and Ecklund (2006b) noted possible relationships between injury and the key characteristics of athlete burnout, specifically feelings of reduced accomplishment, higher physical exhaustion, and increased sport devaluation. Perhaps future studies could continue to further examine the link between burnout and injury.

Limitations of the present study were the sample size for the newly injured sample and the time of year. There were not a large number of athletes that sustained new injuries that would have fit into the inclusion criteria into the Time 2 injured group. The definition for injury may have been too strict, not allowing for greater number of new “injured” participants. The attrition rate also could have affected the injured group. There were a number of athletes who were injured that later either quit or were cut from their team. Future studies could examine these athletes and study if there was a burnout or sport commitment reasons for why they quit/got cut. The time of year the study was conducted was also a limitation. The Time 1 data point was collected near the end of the fall season. This resulted in missing a large potential of new injuries sustained from the fall sport teams.

In conclusion, injured athletes showed higher levels of emotional/physical exhaustion and reduced sense of accomplishment than non-injured athletes. The study showed significant relation between sport commitment and burnout supporting previous research (Raedeke & Smith, 2001; Schmidt & Stein, 1991). The role of injury showed no significant change in either sport commitment or burnout over the course of the year, although some trends did show slight fluctuations. Future research could examine if there are any changes unique to each individual sport. Further investigation into the role of injury as a potential reason for change in sport commitment and burnout needs further study, as well as examining those athletes who were cut or quit their sport to see if there is a sport commitment or burnout reason.

REFERENCES

- Carpenter, P. J., & Coleman, R. (1998). A longitudinal study of elite youth cricketers' commitment. *International Journal of Sport Psychology*, 29, 195-210.
- Carpenter, P. J., & Scanlan, T. K. (1998). Changes over time in the determinants of sport commitment. *Pediatric Exercise Science*, 10, 356-365.
- Cresswell, S. L. (2008). Possible early signs of athlete burnout: A prospective study. *Journal of Science and Medicine in Sport*, 12, 393-398.
- Cresswell, S. L., & Ecklund, R. C. (2004). The athlete burnout syndrome: Possible early signs. *Journal of Sports Medicine*, 7, 481-487.
- Cresswell, S. L., & Ecklund, R. C. (2006a). Changes in athlete burnout over a thirty-week "rugby year." *Journal of Science and Medicine in Sport*, 9, 125-134.
- Cresswell, S. L., & Ecklund, R. C. (2006b). The nature of player burnout in rugby: Key characteristics and attributions. *Journal of Applied Sport Psychology*, 18, 219-239.
- Gould, D., & Dieffenbach, K. (2002). Overtraining, under recovery, and burnout in sport. In M. Kellmann (Ed.), *Enhancing recovery: Preventing underperformance in athletes* (pp. 25-35). Champaign, IL: Human Kinetics.
- Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996). Burnout in competitive junior tennis players: I. A quantitative psychological assessment. *The Sport Psychologist*, 10, 322-340.
- Grylls, E., & Spittle, M. (2008). Injury and burnout in Australian athletes. *Perceptual and Motor Skills*, 107, 873-880.
- Johnston, L. H., & Carroll, D. (2000). The psychological impact of injury: Effects of prior sport and exercise involvement. *British Journal of Sport Medicine*, 34, 436-439.

- Raedeke, T. D. (1997). Is athlete burnout more than just stress? A sport commitment perspective. *Journal of Sport and Exercise Psychology, 19*, 396-417.
- Raedeke, T. D., Granzyk, T. L., & Warren, A. (2000). Why coaches experience burnout: A commitment perspective. *Journal of Sport & Exercise Psychology, 22*, 85-105.
- Raedeke, T. D., Lunney, K., & Venables, K. (2002). Understanding athlete burnout: Coach perspectives. *Journal of Sport Behavior, 25*, 181-206.
- Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport & Exercise Psychology, 23*, 281-306.
- Scanlan, T. K., & Lewthwaite, R. (1986). Social psychological aspects of competition for male sport participants: IV. Predictors of enjoyment. *Journal of Sport Psychology, 8*, 25-35.
- Scanlan, T. K., & Simons, J. P. (1992). The construct of sport enjoyment. In G. C. Roberts. (Ed.), *Motivation in sport and exercise* (pp. 199-215). Champaign, IL: Human Kinetics.
- Scanlan, T. K., Simons, J. P., Carpenter, P. J., Schmidt, G. W., & Keeler, B. (1993). The sport commitment model: Measurement development for the youth-sport domain. *Journal of Sport and Exercise Psychology, 15*, 16-38.
- Schmidt, G. W., & Stein, G. L. (1991). Sport commitment: A model integrating enjoyment, dropout, and burnout. *Journal of Exercise Psychology, 8*, 254-265.
- Smith, R. E. (1986). Towards a cognitive-affective model of athletic burnout. *Journal of Sport Psychology, 8*, 36-50.
- Weiss, W. M. (2011). Longitudinal analysis of sport commitment types: Does injury play a role. *International Journal of Sport Psychology, 42*, 565-585.

- Weiss, W. M., & Weiss, M. R. (2003). Attraction- and entrapment-based commitment among competitive female gymnasts. *Journal of Sport & Exercise Psychology*, 25, 229-247.
- Weiss, W. M., & Weiss, M. R. (2006). A longitudinal analysis of commitment among competitive female gymnasts. *Psychology of Sport and Exercise*, 7, 309-323.
- Weiss, W. M., & Weiss, M. R. (2007). Sport commitment among competitive female gymnasts: A developmental perspective. *Research Quarterly for Exercise and Sport*, 78, 90-102.
- Wiese-Bjornstal, D. M., Smith, A. M., Shaffer, S. M., & Morrey, M. A. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of Applied Sport Psychology*, 10, 46-69.

APPENDIX A
EXTENDED RATIONALE AND PURPOSE

Introduction

Injury is a risk that all athletes face while participating in sport. How injuries affect athletes' perceived body image, sport commitment levels, and burnout levels are not fully understood. Wiese-Bjornstal, Smith, Shaffer, and Morrey (1998) developed a postinjury model that examines athletes' psychological reaction to sustaining an injury. Body image, sport commitment, and burnout all may change based on how an athlete responds to injury (i.e., emotional responses). Perhaps injuries sustained may change athletes' perceived body image, burnout, and sport commitment levels.

Body image is defined as "the mental image a person has of his or her physical appearance, as well as any positive or negative feelings one has about his or her body shape or size" (DeBruin, 2010, pg. 11-12). Many athletes perceive that their bodies need to look a certain way to be considered an elite athlete or to be successful in their sport (Follo, 2007).

Athletes today face difficult challenges about body perceptions (Krane, Waldron, Michalenok, & Stiles-Shipley, 2001) Athletes are aware of how the media portrays athletes, aware of what peers think an athlete should look like, and even have their own pre-conceived notions as to how an athlete's body should look (Loland, 1999). Many athletes perceive their bodies to be appropriate for their sport, yet there is dissatisfaction with their own bodies in the context of what is socially considered to be attractive (Follo, 2007). A distorted body image may possibly lead to an eating disorder (Beals & Manore, 1994).

Interestingly, a number of studies have shown that both male and female athletes report having multiple, separate body images, such as an athletic body image and a social body image (Follo, 2007; Krane et al., 2001; Loland, 1999; Russell, 2004). The athletic body image has been defined as “the internal image one has of his or her body and the evaluation of that image within an athletic context,” whereas social body image has been defined as “body evaluation in the context of daily life” (Greenleaf, 2002, p 64).

Body image in athletes can be separated into two distinct and separate images. First, there is the athletic body image being judged in comparison to the athlete’s sport. Secondly, social body image compares them to what society deems to be beautiful and attractive. Studies have shown just by being an athlete may lead to higher risks of distorted body image and potentially engaging in disordered eating behaviors (Jacobi, Hayward, DeZwaan, Kraemer, & Agras, 2004). Studies have tried to examine which athletes may be at risk for a distorted body image. One possible risk factor could be the athlete’s identity as an elite athlete (DeBruin, Oudejans, & Bakker 2007; Follo, 2007; & Loland, 1999). A meta-analysis by Jacobi et al. (2004) examined the risk factors for eating disorders. Results of the analysis identified athletic competition as increasing risk for developing an eating disorder. Thus perhaps sustaining an injury on top of being a competitive athlete may lead to changes in perceived body image.

To date, the relationship between injury and body image has not yet been examined. Research has linked perfectionism, a perceived loss of control, exercises dependence, and fat phobia to injury (Crawford & Ecklund, 1994; Marchant, Levy, & Clough, 2005; Hewitt, Flett, & Edinger, 1995; Hurst, Hale, Smith, & Collins, 2000). A

commonly held belief about individuals with eating disorders is the self-imposed feeling that they must do everything perfectly. Anything less than perfection is considered a failure (Hewitt et al., 1995). Perfectionism is a personality trait frequently associated with unrealistic standards for physical attractiveness and thinness, and for athlete's unrealistic standards about what they perceive an elite athlete should look like (Krane et al., 2001).

Exercise dependence is also a possible underlying cause to a disturbed body image in an injured athlete (Marchant et al., 2005). Exercise dependence can be defined as a process that compels an individual to exercise in spite of obstacles, and results in physical and psychological symptoms when exercise is withdrawn (Hurst et al., 2000). When an injury occurs, there may be a perceived loss of control; the athlete has no choice, but to sit on the sideline. With this perceived loss of control, the athlete potentially can develop a fat phobia.

The motivation to be successful and the quest to perfection may lead to an exercise dependence and fat phobia in athletes (Marchant et al., 2005). The perceived body image of an injured athlete has not been researched and their motivation to continue participating in sport needs to be examined. One way of understanding motivation for participating in sport is sport commitment.

The sport commitment model was developed to explain factors related to continued motivation for participation in sport or physical activity (Raedeke, 1997). Sport commitment is defined as the "desire and resolve to continue participation" (Scanlan, Simons, Carpenter, Schmidt, & Keeler, 1993, pg. 6). The sport commitment model was based on compelling evidence that enjoyment, or fun, was found to be a primary

participation motive in diverse athletic samples ranging in age, ethnicity, gender, and sport type (Scanlan & Lewthwaite, 1986).

Schmidt and Stein (1991) proposed differences in commitment exist. They suggested that athletes who are committed to their sport because of attraction reasons reported more benefits, more enjoyment, more investments, and lower costs and fewer attractive alternatives associated with participation in their sport. In contrast, athletes who are committed to their sport because of entrapment reasons should perceive lower enjoyment, fewer benefits, and higher costs associated with their participation in sport.

Carpenter and Scanlan (1998) investigated a longitudinal test of the sport commitment model with high school athletes. Changes in the predictor variables over time were related to changes in commitment. Weiss and Weiss (2006) examined whether commitment types change over time and if commitment types differed on level of sport commitment. Commitment types were related to participation behavior one year later and the vulnerable and entrapped groups were more likely to change type of commitment over time versus the attracted group.

It is possible that due to an injury, enjoyment and benefits would decrease, perceived costs and attractive alternatives may both increase, and social support and constraints may change when injured. Johnston and Carroll (2000) explored the effects of injury and how an injury impacts an athlete's psychological state. They noted highly committed athletes expressed more confusion at the end of their rehabilitation because the athlete knows that they are still a long way from attaining their prior status. Sport enjoyment is the strongest predictor of an athlete to continue participation in their sport,

and a lack of enjoyment predicts decreased motivation and may lead to burnout and eventually dropout from sport. Entrapped athletes exhibit higher levels of physical and emotional exhaustion and report higher levels of burnout than the attracted athlete (Raedeke, 1997).

Burnout can be defined as “a psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels” (Raedeke, 1997). In addition to the loss of emotional and physical energy commonly experienced due to the intense demands of training and competing, athlete burnout implies a negative assessment of the self and sport (Raedeke, Granzyk, & Warren 2000). Athletes are more likely to experience burnout if they are involved in sport for mainly entrapment reasons. Raedeke (1997) showed that athletes who exhibited characteristics reflecting the entrapment group of the sport commitment perspective had higher burnout scores than athletes who were in the attracted group.

Early warning signs of burnout indicate an athlete may be at risk. In contrast, proposed symptoms signify that an athlete may actually be experiencing burnout. Symptoms refer to indicators of the key characteristics of burnout that athletes may experience such as: nagging disappointment might be an early warning sign of the risk of impending burnout whereas enduring negative mood shifts would be classified as a symptom of emotional exhaustion (Cresswell & Ecklund, 2004).

Athlete burnout has been suggested to be the result of a negative shift in motivation (Gould, Udry, Tuffey, & Loehr, 1996). High motivation and personal

investment are perceived as being stressful. Failing to cope with the stress leads to negative outcomes with the athlete, and over time, can eventually lead to the athlete experiencing physical and psychological disengagement (Smith, 1986). The combination of increased training loads, restricted time for adequate recovery, and increased competitive stress, thereby increases the risk for burnout among athletes (Gould & Diefenbach, 2002).

There is little research on the longitudinal changes in burnout levels. Cresswell and Ecklund (2006b) suggested that the burnout experienced is dynamic and changing as proposed within the stress based explanations. Past research has not yet fully examined the burnout experience over time. Therefore, the need to monitor burnout across time is important to fully understand the burnout syndrome in athletes. Very few studies have specifically examined the connection between an injury and resulting burnout syndrome.

Purpose of the Study

The purpose of this study was to examine the relationship between injury, perceived body image, sport commitment, and burnout from a longitudinal perspective. The first purpose of this study was to examine change over time in perceived body image, sport commitment, and burnout. The second purpose of the study was to examine changes in perceived body image, sport commitment, and burnout due to injury. The final purpose of the study was to examine the differences between athletes who were injured versus those who were not injured on perceived body image, sport commitment, and burnout.

Significance of the Study

The proposed study is significant, as the results will add to the current knowledge base on reactions to injury, body image perceptions, burnout, and changes in sport commitment. No research to date has examined the role of injury in relation to the perceived body image of an athlete. A distorted body image is a major risk factor of developing an eating disorder or potentially sustaining yet another injury. Clinicians, coaches, and parents may benefit from identifying body image changes in an injured athlete and counsel appropriately. Additionally, few studies have examined the role of injury as it relates to sport commitment levels (Weiss, 2011). The role of injury on athlete burnout levels will be examined over time.

Delimitations

The study will be delimited to:

1. Collegiate Division I athletes
2. Athletes will be between the ages of 18-25 years.
3. Self-report questionnaires designed to determine athletes' perceptions of body image, sport commitment, and athlete burnout.

Limitations

The following limitations are identified for this study:

1. Participants will be selected from one Division I campus in Iowa, and may not reflect the total population of all Division I athletes across the country.

Assumptions

The study will be conducted with the following assumptions:

1. All the participants will answer the questionnaire honestly and accurately.
2. The questionnaires will be valid and reliable measures of body image, sport commitment, and burnout.
3. All participants will understand the questionnaire items.
4. All participants will understand the instructions given.

Research Questions

1. Is there a difference between athletes who are injured versus those who were not injured in their perceived body image?
2. Will perceived body image in athletes change over time?
3. Will perceived body image change when an athlete sustains an injury?
4. Is there a difference between injured and non-injured athletes on sport commitment and burnout?
5. Will there be any changes to sport commitment and burnout over time?
6. Will there be any changes to an athlete's sport commitment and burnout when an injury is sustained?

Definition of Terms

Body Image: The mental image a person has of his or her physical appearance, as well as any positive or negative feelings one has about his or her body shape or size (DeBruin, 2010).

Sport Commitment: “A psychological construct representing the desire and resolve to continue sport participation” (Scanlan et al., 1993).

Injury: Damage or harm to an individual that causes them to not fully participate in practice or competition for at least 7 days.

Burnout: A psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels (Raedeke, 1997).

APPENDIX B
EXTENDED LITERATURE REVIEW

Introduction

Injury is an inherent risk for all athletes participating in sport. The impact that injuries have on athletes psychologically and emotionally is not fully understood. More specifically, how injuries affect athletes perceived body image, sport commitment levels, and burnout levels should be explored. Many athletes perceive that their bodies need to look a certain way to be considered an elite athlete or to be successful in their sport (DeBruin, 2010). Perhaps injuries sustained may change athletes' self-perceptions, burnout, and sport commitment level.

Wiese-Bjornstal et al. (1998) developed a postinjury model that examines the athletes' psychological reaction to being injured. The Wiese-Bjornstal psychological reaction to injury model details the factors that influence how an athlete responds to being injured. The psychological reaction to injury model has three primary factors: appraisal, emotional response, and behavioral response. Thus, body image, sport commitment, and burnout all may change based on how an athlete responds to injury (i.e., emotional responses).

Scanlan et al. (1993) introduced the sport commitment model to examine the reasoning why athletes continue participation in sport. Weiss (2011) examined the relationship between commitment types and injury. The findings were not significant in relation to whether an athlete suffered an injury based on the preseason commitment types or the athlete's end of the year commitment type. Becoming injured may change the level of sport commitment of the athlete, leading to less commitment, and the possibility of becoming burned out.

Burnout can be defined as “a psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels” (Raedeke, Lunney, & Venables, 2002). To be able to identify athletes at risk of developing burnout, there needs to be an understanding of the early warning signs of burnout. It has been suggested that athlete’s burnout is a result of a negative shift in motivation (Gould et al., 1996). Very few studies have specifically examined the connection between an injury and resulting burnout syndrome (e.g., Grylls & Spittle, 2008). Injury may change an athlete’s body image, sport commitment, and burnout; all of these factors are part of a psychological reaction to being injured.

For this study, the role of injury will be examined and how injury may affect an athlete’s perceived body image, sport commitment, and burnout levels. First, an introduction to the Wiese-Bjornstal reaction to injury model will be discussed. Second, the various facets of body image will be introduced. Third, the concept of sport commitment is reviewed. Finally, the role of burnout in sport will be examined.

Psychological Response to Injury

Wiese-Bjornstal et al. (1998) developed a cognitive appraisal model to explain an athlete’s psychological reaction to injury. The model expands on the Anderson-Williams (1988) model of stress and athletic injury. The authors developed this model from previous research examining personal factors, situational factors, cognitive appraisal, and behavioral and emotional responses.

According to this theoretical model, an injury is considered a stimulus that must be interpreted by the athlete. Many different factors combine to form how an athlete interprets what has happened (i.e., the injury). Each individual athlete has his or her own personal factors that contribute to how the athlete reacts to the stressor, such as: prior experiences of injury, emotional responses, trait anxiety, self-esteem, and coping skills. Several situational factors also contribute to how the athlete cognitively appraises injury. Situational factors include: type and severity of the injury, sport, starter status, time of season, teammate and coach influences, and family dynamics. Both personal and situational factors play a role in the cognitive appraisal of the injury, or how the athlete interprets the injury. The cognitive appraisal of the athlete dictates how the athlete responds emotionally and behaviorally. Emotional responses could include fear, anger, frustration, and guilt. The cognitive appraisal also affects the athlete's behavioral response. For example, the athlete may make less of an effort during rehab, start skipping rehabilitation sessions, or to partake in more risk taking behaviors.

Based on this psychological reaction to injury model, a variety of personal factors (e.g., self-perceptions, sport commitment) and situational factors (e.g., time of season, playing status) will influence the way injured athletes cognitively appraise injury (Wiese-Bjornstal et al., 1998). In turn, how athletes cognitively appraise injury influences the emotional (e.g., burnout) and behavioral reactions. This model can help in the athletic training profession by raising awareness to the psychological reactions of athletes when injured. Potentially, some of the personal and situational factors could be modified, and

clinicians may be able to introduce an intervention to break the athlete out of the vicious cycle that may occur once injured.

One personal factor in particular that may influence how an athlete cognitively appraises an injury is self-perceptions, specifically body image. Whether injury effects perceived body image has yet to be examined.

Body Image

Athletes today face difficult challenges about body perceptions (Krane et al., 2001) Athletes are aware of what the media portrays an athlete as, aware of what peers think an athlete should look like, and even have their own pre-conceived notions as to how an athlete's body should look (Loland, 1999). Many athletes perceive their bodies to be appropriate for their sport, yet there is dissatisfaction with their own bodies in the context of what is socially considered to be attractive (Follo, 2007). A distorted body image may possibly lead to an eating disorder (Beals & Manore, 1994). Body image is defined as "the mental image a person has of his or her physical appearance, as well as any positive or negative feelings one has about his or her body shape or size" (DeBruin, 2010). Body image distortions are part of the diagnostic criteria for clinical eating disorders (Sundgodt-Borgen, 1993). DeBruin, Oudejans, Bakker, and Woertman (2011) showed that women athletes with disordered eating perceived themselves as fatter than women athletes without disordered eating habits.

Interestingly, a number of studies have shown that both male and female athletes report having multiple, separate body images, such as an athletic body image and a social body image (Follo, 2007; Krane et al., 2001; Loland, 1999; Russell, 2004). The athletic

body image has been defined as “the internal image one has of his or her body and the evaluation of that image within an athletic context,” whereas social body image has been defined as “body evaluation in the context of daily life” (Greenleaf , 2002, p. 64). An investigation into the development of body satisfaction among female rugby players found that in that they perceived their body as functional and positive for their sport, and their body satisfaction increased on the field (Russell, 2004). However these players’ felt too big and too muscular for what is deemed beautiful for women off the field. DeBruin et al. (2011) also found that body images differed between athlete’s athletic body and social body. These differences were significantly greater for athletes who were identified with an eating disorder. In general, these athletes had a more negative athletic body image than daily life body image. The authors hypothesized that these athletes viewed thinness as a direct relation to winning. It should be noted, the athletes in the study were participating in sports that emphasized leanness, low weight, and appearance, such as figure skating, gymnastics, and cross country running.

Smith (2004) found that social physique anxiety was higher in females as compared to males. In addition, participants with higher social physique anxiety in this situation tended to experience higher levels of anxiety, apprehension, and fear of a negative social perception (Hart, Leary, & Rajeski, 1989). Athletes possibly may overcome these anxieties and perceptions of feeling society does not view them as being “elite” by becoming dependant or obsessive with making their bodies look like what an elite athlete is “supposed to look like.” This may be problematic in athletics at the Division I level when athletes may be viewed on television or in front of thousands of

people in the crowd. Gay, Monsma, and Torres-McGehee (2011) found aesthetic individual sport athletes were at greater risk for increased social physique anxiety. Additionally, body dissatisfaction and concern for thinness and perfectionism were significant predictors of social physique anxiety with a sample of female collegiate athletes (Krane et al., 2001).

Body image in athletes can be separated into two distinct and separate images. There is the athletic body image being judged in comparison to the athlete's sport. Secondly, social body image compares them to what society deems to be beautiful and attractive. Studies have shown just by being an athlete may lead to higher risks of distorted body image, and potentially engaging in disordered eating behaviors (Jacobi et al., 2004). Additionally, several psychological characteristics could put some athletes at greater risk for both perceived body image and disordered eating practices, such as athletic identity, perfectionism, and exercises dependence.

Athletes at Increased Risk

Studies have examined which athletes may be at greater risk for a distorted body image. One possible risk factor could be the athlete's identity as an elite athlete (DeBruin et al., 2007; Follo, 2007; Loland, 1999). A meta-analysis by Jacobi et al. (2004) examined the risk factors for eating disorders. Results of the analysis identified athletic competition as increasing risk for development of an eating disorder.

Picard (1999) and Perriello (2001) identified women's track and field and cross-country participants as being more at risk for developing eating disorders than non-athletes or wrestlers. Female track and field and cross-country athletes may have

perceived that being thin was the key to success. Davis (1992) indicated that athletes involved in lean sports, such as track, might feel the pressure to maintain a low weight, and therefore train and diet harmfully. Petrie (1996) examined the differences between college men and women who participated in a “lean” sport, which was defined by weight and appearance being central to success, and men and women in a “nonlean” sport, and non-athletes. Results revealed that female athletes in lean sports were more preoccupied with weight than either the female athletes in non-lean sports or female non-athletes. Johnson, Powers, and Dick (1999) collaborated with the NCAA to study disordered eating among college athletes. The athletes completed questionnaires designed to measure body image attitudes, such as the drive for thinness and body dissatisfaction, and eating behaviors. Results indicated that female athletes reported more difficulty with disordered eating, higher rates of female athletes were identified as having bulimia, and more female athletes reported purging behaviors than did male athletes.

DeBruin et al. (2011) reported that high performance women athletes with disordered eating were significantly more negative about multiple body image components as compared to athletes without an eating disorder. This study noted that the participants were mostly lean, high endurance athletes. These athletes had a more negative athletic body image than daily life body image. It may have been due to their sport involvement that led to a body that is more in line with what is considered socially beautiful, and therefore the athletes in the study were more dissatisfied with their athletic body. DeBruin et al. (2007) showed that dieting behaviors of gymnasts were only slightly related to perceived body image. Coaching pressures to be thin, however, was more

significantly related to an increasingly distorted body image. This suggests that, perhaps, the gymnasts were not under the assumption that thin was more attractive, but rather the gymnasts were being told that being thin was the key to being successful.

Athletes seem to measure themselves in relation to the predominant body ideal of their sport (Loland, 1999). Athletes compare themselves to the idea of what an elite athlete in their sport looks like, and make the connection that this is what they are supposed to look like in order to be successful. Just being an athlete is a risk factor for disordered eating (Jacobi et al., 2004). This suggests that sustaining an injury on top of being a competitive athlete may lead to changes in perceived body image.

To date, the relationship between injury and body image has not yet been examined. There has been research linking perfectionism, a perceived loss of control, exercises dependence, and fat phobia to injury. These factors also potentially play a role in a perceived distorted body image. A commonly held belief about individuals with eating disorders is the self-imposed feeling that they must do everything perfectly. Anything less than perfection is considered a failure (Hewitt et al., 1995). For example, athletes who have recently become injured may view themselves as letting down their teammates, coach, or even themselves, and may consider themselves, or their body, a failure. Perfectionism is a personality trait frequently associated with unrealistic standards for physical attractiveness and thinness, and for athlete's unrealistic standards about what they perceive an elite athlete should look like (Krane et al., 2001).

Exercise dependence is also a possible underlying cause to a disturbed body image in an injured athlete (Hurst et al., 2000). Exercise dependence can be defined as “a

process that compels an individual to exercise in spite of obstacles, and results in physical and psychological symptoms when exercise is withdrawn” (Hurst et al., 2000). Fat phobia is the negative attitudes towards fat people and the fear of oneself becoming fat (Marchant et al., 2005). This fat phobia can lead an individual to become addicted or dependant on exercise. Athletes that have lived their lives with structured exercise in practice or competitions may become dependant on exercise.

When an injury occurs, there may be a perceived loss of control; the athlete has no choice, but to sit on the sideline. With this perceived loss of control, the athlete potentially can develop a fat phobia. Marchant et al. (2005) showed that participant’s fat phobia scores were significantly related with total exercise dependence scores. The individuals with the higher fat phobia scores had the strongest exercise withdrawal symptoms. Thus, an athlete who is injured may be exhibiting exercise dependence withdrawal symptoms. Therefore, if perfectionism, exercise dependence, fat phobia, and a perceived loss of control influence body image and have a relationship with injured athletes, then perhaps there is a similar relationship between injury and body image.

Body image is the internal image one has of his or her body and the evaluation of that image within an athletic context. Jacobi et al. (2004) showed that the fact of being an athlete increases the risk of developing a distorted body image. Athletes are at risk of developing a distorted body image through pressures to conform their body to a certain mold, it may be because a certain body type is what is deemed necessary to be considered successful in their sport. Coaching pressure may lead an athlete to develop a distorted body image, when it is stressed that an athlete must be thin in order to win. The

motivation to be successful and the quest to perfection may lead to an exercise dependence and fat phobia in athletes (Marchant et al., 2005). The perceived body image of an injured athlete has not been researched and their motivation to continue participating in sport needs to be examined. One way of examining motivation for participating in sport is sport commitment.

Sport Commitment

The sport commitment model was developed to explain factors related to continued motivation for participation in sport or physical activity (Raedeke, 1997). Sport commitment is defined as the “desire and resolve to continue participation” (Scanlan et al., 1993, pg. 6). The sport commitment model was based on compelling evidence that enjoyment, or fun, was found to be a primary participation motive in diverse athletic samples ranging in age, ethnicity, gender, and sport type (Scanlon & Lewthwaite, 1986).

Casper and Andrew (2008) examined the difference in the levels of reported sport commitment and its association on competitive level (recreational and collegiate tennis players) and skill level (beginning, intermediate, and advanced). The results indicated that collegiate athletes reported significantly higher levels of sport commitment, involvement opportunities, and social constraints than the recreational athletes. The increased levels of sport commitment may be related to the scholarships/financial aid they received. The recreational adult participants reported higher levels of enjoyment as compared to the collegiate players. This may be the result of the adult recreational athlete participating purely for enjoyment of the sport versus the collegiate athlete who views their sport as their “job.” The data indicated that as players advance in skill mastery, they

become more committed to the sport, but enjoyed the sport less than players competing at lower skill levels (Casper & Andrew, 2008).

Scanlan and Simons (1992) identified three important features of the sport commitment model. First, sport commitment addresses the psychological attachment to an activity. Second, sport commitment is a product of both cognitive and affective factors. Third, the sport commitment model is able to distinguish differing psychological states of participants who may report equal levels of commitment. Sport commitment examines the meaning behind commitment that individuals have for the activities in which they participate (Scanlan & Simons, 1992). Athletes can be involved in a sport for a combination of reasons, related to either attraction, which implies the athlete wants to participate, and entrapment that implies the athlete feels they have to continue to participate (Raedeke, 1997).

Commitment Types

Schmidt and Stein (1991) proposed differences in commitment towards sport. They suggested that athletes who are committed to their sport because of attraction reasons reported more benefits, enjoyment, and investments, and lower costs and attractive alternatives associated with participation in their sport. Athletes who are committed to their sport because of entrapment reasons should perceive lower enjoyment and benefits, and higher costs associated with their participation in sport. Entrapped athletes perceive they are invested in their sport and do not see other activities or other sports as an attractive alternative. The entrapped athlete experiences more negatives than positives associated with participation, but remain involved because they have invested

so much. Schmidt and Stein also proposed a profile of low committed athlete, characterized as having low enjoyment, benefits, and investments, and higher costs and attractive alternatives. These athletes may be more susceptible to dropping out. Weiss and Weiss (2007) compared commitment types on a level of sport commitment. They found that in agreement with Schmidt and Stein (1991) that attracted athletes were highest in enjoyment and benefits and were most likely to continue with their sport. Entrapped athletes however should be predicted to be just as likely to continue as attracted athletes, and to have similar levels of commitment. Entrapped athletes however had lower levels of commitment than attracted athletes.

Weiss and Weiss (2003) replicated Raedeke's (1997) study with elite female gymnasts. Three different commitment profiles emerged, attracted, entrapped and vulnerable. Attracted and entrapped showed similar results with attracted being characterized by having higher enjoyment, more benefit, lower costs and attractive alternatives. Entrapped athletes were characterized by having lower enjoyment, fewer benefits, higher perceived costs and attractive alternatives. A third group was identified as vulnerable athletes. The vulnerable is susceptible to joining either the attracted or the entrapped groups. The vulnerable group was characterized by having moderately lower enjoyment and benefits, average costs and moderately higher attractive alternatives.

Carpenter and Scanlan (1998) investigated a longitudinal test of the sport commitment model with high school athletes. They reported that the changes in the predictor variables over time were related to changes in commitment. The authors noted that over time, increases in involvement opportunities and enjoyment were related to an

increase in the desire and resolve to continue sport. Increases in social constraints over time led to decreases in overall commitment levels. Carpenter and Coleman (1998) conducted a longitudinal investigation of elite youth cricketers' commitment. The authors found that change over time was significantly predicted by changes in: enjoyment, recognition opportunities such as winning awards, and social opportunities (e.g., making new friends).

Weiss and Weiss (2006) conducted a study to examine whether commitment types change over time and if commitment types differed on level of sport commitment. Commitment types were related to participation behavior one year later. Vulnerable and entrapped groups were more likely to change over time versus the attracted group. The majority (63.5%) of the gymnasts retained the same commitment profile, but over one-third of the sample "cluster-hopped." 15 out of 23 "cluster hoppers" were previously categorized in the vulnerable commitment type. Seven of the 15 reported increased enjoyment and benefits, costs and attractive alternatives decreased, thus they moved into the attracted profile. For eight of the 15, enjoyment and benefits decreased and they moved into the entrapped commitment profile. Weiss and Weiss (2006) found 25% of entrapped athletes quit as compared to 14.5% of attracted athletes, and 9% of the vulnerable athletes.

Weiss (2011) investigated athletes of varying types of sport commitment over time and examined the relationship between commitment types and injury. Results showed that for the attracted group, about 40% of the athletes experienced more negative experiences one year later, which led to a change in commitment type. None of the

athletes in the study experienced enough positive experiences to move them from entrapped to the attracted group. The study also examined the relationship between commitment types and injury. The findings were not significant in relation to whether an athlete suffered an injury based on the preseason commitment types. A Time 2 study was conducted to examine if the athletes' end of the year commitment type was related to whether they had suffered an injury in the previous year, again there was no statistical significance.

It is possible that due to injury, enjoyment and benefits would decrease, perceived costs and attractive alternatives may both increase, and social support and constraints may change when injured. Johnston and Carroll (2000) explored the effects of injury and how an injury impacts an athlete's psychological state. Highly committed athletes expressed more confusion at the end of their rehabilitation because the athlete knows that they are still a long way from attaining their prior status. The injured athlete may add the medical staff as a source of social support, and might experience greater constraints from coaches and teammates who express the need for the injured athlete to come back.

The sport commitment perspective suggests that athletes can be involved in sport for a combination of reasons related to sport-attraction and sport-entrapment. Studies have examined the link between burnout and the sport commitment perspective (Raedeke, 1997; Schmidt & Stein, 1991). Sport enjoyment is the strongest predictor of an athlete to continue participation in their sport, and a lack of enjoyment predicts decreased motivation and may lead to burnout and eventually dropout from sport. Entrapped

athletes exhibit higher levels of physical and emotional exhaustion and report higher levels of burnout than the attracted athlete (Raedeke, 1997).

Burnout

There are a number of varying definitions of burnout and what constitutes burnout. Burnout can be defined as “a psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels” (Raedeke, 1997). In addition to the loss of emotional and physical energy commonly experienced due to the intense demands of training and competing, athlete burnout implies a negative assessment of the self and sport (Raedeke et al., 2000). Athletes are more likely to experience burnout if they are involved in sport for mainly entrapment reasons. Raedeke (1997) showed that athletes who exhibited characteristics reflecting the entrapment group of the sport commitment perspective had higher perceptions of burnout than athletes who were in the attracted group.

Cresswell and Ecklund (2004) explained burnout as having three central characteristics including the sense of reduced accomplishment, sport devaluation, and physical and emotional exhaustion. Rugby athletes reported the negative experiences such as: including pressure to perform, competition demands, workload, injury, the environment, and expectations as factors that are related to the description of burnout (Cresswell & Ecklund, 2003). Lemyre, Treasure, and Roberts (2006) define burnout as a syndrome characterized by progressive disillusionment, with related psychosocial and physical symptoms leading to a diminished sense of self-worth. Lemyre suggests athletes

suffer burnout as a result of excessive physiological and psychological exertion in the pursuit of a goal, without getting the proper time to recover both physically and mentally. When athletes suffer from burnout, they typically experience: chronic fatigue, poor sleep patterns, episodes of depression, and a sense of helplessness.

Raedeke et al. (2002) examined coaches' viewpoints in order to identify points of convergence and divergence between coaches' perspectives and academic definitions of athlete burnout to define signs and symptoms of burnout. Four primary dimensions were identified: withdrawal, reduced sense of accomplishment, physical, and psychological exhaustion, and devaluation of sport. The coaches described factors causing and preventing burnout as well. Outside pressures such as time demands, performance demands, pressure from parents, coaches, and friends, pressure to win and overtraining stress, were all highly related to an increase in athlete burnout. Athlete entrapment, or a feeling of being forced to participate in sport, was also identified as another reason for athlete burnout. These feelings arose from the athlete's perceptions that they no longer had control of their sport participation (Raedeke et al., 2002). To be able to recognize athletes at risk of developing burnout, there needs to be an understanding of early warning signs an athlete may be susceptible to burnout.

Early Signs of Burnout

Early warning signs of burnout indicate an athlete may be at risk. In contrast, proposed symptoms signify that an athlete may actually be experiencing burnout. Symptoms refer to indicators of the key characteristics of burnout that athletes may experience. For example, nagging disappointment might be an early warning sign of the

risk of impending burnout, whereas enduring negative mood shifts would be classified as a symptom of emotional exhaustion (Cresswell & Ecklund, 2004).

Cresswell and Ecklund (2004) studied the relationships among proposed early warning signs and the athlete burnout syndrome in rugby players. Five proposed early signs were included in the study: competence related perceptions, perceptions of rugby-related hassles, perceptions of control over rugby career, satisfaction with social support, and concerns about money-related hassles. The results provided evidence of the relationship between the identified early warning signs and athlete burnout syndrome. Specifically, high levels of perceived rugby hassles was positively associated with athlete burnout, and players' perceptions of money hassles were associated with a high level of reduced accomplishment. Although there may be early warning signs that may lead to burnout, there is the possibility these signs are indicating burnout has already occurred.

It has been suggested anxiety levels may be able to accurately predict burnout levels in athletes. It is unlikely to assume that all athletes perceiving certain levels of anxiety will suffer equally from burnout symptoms (Raedeke & Smith, 2004). Cremades, Wated, and Wiggins (2011) showed that self-confidence and gender were the only two variables found to predict burnout levels. Cremades and Wiggins (2008) tried to predict burnout from trait anxiety in Division I collegiate athletes. The results suggested self-confidence was the only variable that predicted burnout symptoms. Raedeke and Smith (2004) examined whether coping resources, such as sleep patterns and time management, or if social support would help to mediate the relationship between stress and strain in

athletes. The authors found conflicting evidence regarding the relationship, and the effectiveness of alternative means of coping with stressors for athletes remain unclear.

Athlete burnout could also be the result of a negative shift in motivation (Gould et al., 1996). High motivation and personal investment are perceived as being stressful. Failing to cope with the stress leads to negative outcomes with the athlete, and over time can eventually lead to the athlete experiencing physical and psychological disengagement (Smith, 1986). The combination of an increased training loads, restricted time for adequate recovery, and increased competitive stress thereby increases the risk for burnout among athletes (Gould & Diffenbach, 2002).

Lemyre et al. (2006) studied the shifts along the self-determined motivation continuum to predict susceptibility to athlete burnout. Findings showed that a decrease in the quality of motivation throughout a season increases an athlete's susceptibility to feeling burned out at the end of the season. The study provided evidence that systematic monitoring of changes in an athlete's quality of motivation is important to help steer athletes away from potential burnout.

Gustafsson, Kentta, Hassmen, and Johansson (2007) examined the prevalence of burnout in a population of adolescent elite athletes. The imbalance between costs and rewards was an important contributor to burnout. A failure to achieve results was also a factor contributing to burnout for all athletes. The results showed that between 2% and 6% of male athletes, and between 1% and 9% of female athletes experienced high levels of burnout. The findings showed that for males, team sport athletes reported higher levels

of burnout that individual sports, whereas, no differences were found on sport type for females’.

Grobbelaar, Malan, Steyn, and Ellis (2010) compared elite student rugby players’ recovery stress, burnout, and mood state scores, based on their playing position, experience level, and starting status. The results showed playing position, experience level, and starting status were all related to the key characteristics of burnout. Athletes in the starting line-up were subject to greater stress levels, had poorer recovery strategies, and generally experienced greater negative mood state than did reserve players. The very experienced players had higher total burnout, reduced sense of accomplishment, and emotional and physical exhaustion than more novice athletes.

There is little research on the longitudinal changes in burnout levels. Cresswell and Ecklund (2006b) suggested that the burnout experience is dynamic and changing as proposed within the stress based explanations, past research has not yet fully examined the burnout experience. Therefore, the need to monitor burnout across time is important to fully understand the burnout syndrome in athletes. Cresswell and Ecklund (2006a) examined changes in athlete burnout across a 30-week competitive rugby season. Results suggested some variation in all the key characteristics of burnout, but statistically significant variations were only observed in players’ reports of reduced accomplishment within the competitive year. Exhaustion scores were dependent on the player’s position, which the authors suggest may provide support linking burnout to perceptions of physical training and playing stress (Cresswell & Ecklund, 2006a)

Very few studies have specifically examined the connection between an injury and resulting burnout syndrome. Cresswell and Ecklund (2006b) examined athlete burnout over time, the authors noted possible relationships between injury and the key characteristics of athlete burnout. Players who reported more injuries reported feelings of reduced accomplishment, physical and emotional exhaustion, and sport devaluation. About 64.2% of the players reported experiencing one or more injuries that, on average, resulted in more than 28 days of time lost due to injury. These findings support previous research in which some tennis and rugby players reported believing injury was strongly linked to their burnout experiences (Cresswell, 2008; Gould et al., 1996). The relationship between injury and burnout may be due to the often lengthy and frustrating nature of being injured. Overall, the injured players were likely to experience increased feelings of burnout because they were not active in practice or competition.

Grylls and Spittle (2008) examined athlete burnout in Australian athletes who were either currently injured or uninjured. Results revealed burnout scores were lower than previous norms of past research. The authors suggested one possible explanation for the low burnout scores is the voluntary nature of sport, especially at lower levels. Physical and emotion exhaustion and depersonalization were significantly higher for athletes competing at higher competition levels. The authors noted currently uninjured athletes reported higher burnout scores. The authors suggested that this might be due to the injured athletes having a break from sport involvement, and the currently uninjured athletes spending more time involved in sport, which increased their physical exhaustion.

The data suggested multiple injuries over a period of time could have a cumulative effect on burnout levels.

Summary

Body image is the subjective mental image of one's own body. Many athletes report having distinct separate body images, an athletic body image and a social body image. The athletic body image is the perception an athlete holds on what an elite athlete in their chosen sport should look like. The social body image is the athlete's perception of what should be considered beautiful in everyday daily life. Jacobi et al. (2004) identified that just being an athlete is a risk factor for developing distorted body images. The athlete in particular is at risk for developing distorted body images from possible factors such as: emotional intelligence, perfectionism, and exercise dependence. To date, there is no research investigating athletic injury and body image changes. Dealing with the stress of molding their body into what they perceive an elite athlete should look like may increase stress levels, possibly increasing perceived costs to their sport and reducing the enjoyment the athlete once held to their sport, this may lead to a change in their sport commitment levels.

The sport commitment model was developed to explain factors related to continued motivation for participation in sport or physical activity. Sport commitment is defined as the "desire and resolve to continue participation" (Scanlon et al., 1993, pg. 6). The sport commitment perspective suggests that athletes can be involved in sport for a combination of reasons related to sport attraction and sport entrapment. Entrapped athletes exhibit higher levels of physical and emotional exhaustion and report higher

levels of burnout than the attracted athlete (Raedeke, 1997). There is minimal research that examines specifically the role of injury on sport commitment levels and resulting changes in sport commitment due to suffering an injury.

Burnout can be defined as “a psychological, emotional, and physical withdrawal from an activity or sport because there is no other perceived way to escape the situation and the related overwhelming stress levels.” Raedeke (1997) showed athletes who exhibited characteristics reflecting the entrapment group of the sport commitment perspective had higher burnout scores than athletes who were in the attracted group. There is little research on the longitudinal changes in burnout levels. Cresswell and Ecklund (2006b) suggested that the burnout experienced is dynamic and changing as proposed within the stress based explanations. Past research has not yet fully examined the burnout experience over time. Therefore, the need to monitor burnout across time is important to fully understand the burnout syndrome in athletes. Very few studies have specifically examined the connection between an injury and resulting burnout syndrome.

Therefore the purpose of this study was to examine the relationship of injury on the perceived body image, sport commitment, and burnout levels of athletes from a longitudinal perspective.

APPENDIX C
EXTENDED METHODS

Methods

The purpose of this study was to examine the relationship between injury and perceived body image, sport commitment, and burnout levels of athletes. This chapter will review the participants, measures, procedures for collecting data, and data analysis.

Participants

At Time 1, a total of 285 participants completed measures for this study, with 49 participants reporting being injured at Time 1. Athletes were classified as “injured” if their injury required them to have limited participation for a minimum of 7 days. Approximately 83% of the Time 1 sample reported not being injured. Male ($n = 145$) and female ($n = 140$) athletes had a mean age of 19.69 years ($SD = 1.35$). The sample was predominately Caucasian (88%) while the remaining participants described themselves as African American (7%), Hispanic (1%), Asian (1%), and Biracial (1%).

Participants were involved with one of the following teams: women’s basketball (3%), men’s basketball (5%), women’s soccer (10%), women’s track and field/cross country (13%), men’s track and field/cross country (12%), softball (6%), wrestling (12%), football (17%), women’s swimming and diving (10%), tennis (2%), men’s golf (6%), and women’s golf (4%). The participants ranged in NCAA eligibility status from freshman through seniors (84%), red shirt/medical hardship (9%), and 5th year seniors (6%). The majority of the participants identified themselves as a starter (55%), with the remaining participants identifying themselves as nonstarters (29%), or red shirt/medical hardship (14%). Participants were currently participating in the regular season (51%), preseason (27%), post-season/playoffs (3%), and the off-season (19%).

Through the course of the study, 10 individuals that participated in Time 1 sustained new injuries that fit the injury criteria to be included for Time 2. The injured participants identified themselves as male ($n = 8$) and female ($n = 2$) athletes ranging in age from 19 to 22 ($M = 20.3$, $SD = 1.34$). Injured athletes identified themselves as primarily starters (60%) with the remaining identifying themselves as either non-starters (20%) or redshirt/medical hardships (20%). At Time 3, a total of 215 of the original 285 participants completed measures (male, $n = 99$; female, $n = 116$).

Measures

Questionnaires were approved for use by the IRB. The questionnaires were designed to assess: perceived body image, sport commitment, and burnout levels. Demographic data was also collected including: age, gender, sport, year of eligibility, starter status, time of season, and ethnicity. The questionnaire can be seen in Appendix D.

Body Image. In order to assess an athlete's perceived body image, a set of twelve questions was used. The Social Physique Anxiety Scale (SPAS), developed by Hart et al. (1989), assesses the level of anxiety an individual experiences when others may be evaluating their physique. This scale has been widely tested on a range of participants including: men (e.g., Davis, Brewer, & Weinstein, 1993), women (e.g., Eklund & Crawford, 1994), young (e.g., McAuley & Burman, 1993), and middle aged individuals (e.g., McAuley, Bane, Rudolph, & Lox, 1995). The SPAS has been tested and shown to be reliable and valid (Crawford & Eklund, 1994; Eklund, Mack, & Hart, 1996) with reliability alpha levels ranging from .81 to .90. A 5-point Likert scale was used for

responses ranging from 1 “not at all” to 5 “very much so.” An example of a body image question is, “I wish I wasn’t so uptight about my body.”

Sport Commitment. In order to assess the athletes’ level of sport commitment, a set of five questions, developed by Scanlan and colleagues was used (Scanlan et al., 1993). These questions have been used in previous studies and have demonstrated adequate reliability and validity (Weiss, 2011; Weiss & Weiss, 2003, 2006, 2007). A 5-point Likert scale was used, with participants’ responses ranging from 1 “not at all” to 5 “very much so.” An example of a sport commitment question is “How dedicated are you to competing in your sport?”

Burnout. In order to assess the athlete’s level of burnout, a set of fifteen questions will be used. The questions, developed by Raedeke and Smith (2001), will measure the athlete’s current level of burnout and consists of 3 subscales: emotional/physical exhaustion, reduced sense of accomplishment, and devaluation. The findings of Raedeke and Smith supported construct validity and the reliability of the measure ($\alpha = .86 - .92$). A 5-point Likert scale will be used for participants’ responses ranging from 1 “almost never” to 5 “almost always.” An example of a reduced accomplishment burnout question is “I am not achieving much in sport.” An example of an emotional/physical exhaustion burnout question is “I feel overly tired from my sports participation.” An example of a devaluation burnout question is “I don’t care as much about my sport performance as I used to.”

Injury. Injury was defined as a physical ailment that occurs during practice, competition, or workouts that limited an athlete's participation for at least 7 days. The total number of injuries each athlete sustained were recorded.

Procedures

Following approval from the Human Participants Review Board, the researcher contacted the head coaches of the Division I sport teams at the University of Northern Iowa seeking cooperation with participant recruitment. Head coaches were asked to help facilitate a meeting with the primary researcher. The researcher then attended a meeting or practice with each team to recruit potential participants.

The participants were asked to read and sign the consent form if they choose to participate. If the athlete chose to participate, the primary researcher then distributed the questionnaire. If any questions developed, the researcher was on site to answer any questions and ensure the instructions were clear. The researcher reminded all participants that participation in the study was strictly voluntary and each participant was free to withdraw from participation at any time. The participants were asked to answer each question honestly and return the questionnaire once it was completed.

Participants in the study completed a Time 1 questionnaire to establish baseline levels. During the course of the study, the researcher was in contact with the head certified athletic trainer of each sport regarding injury status of the participating athletes. If an injury occurred to an athlete which caused the athlete to not participate or have limited participation for at least 7 days, the researcher then set up a time to meet with that injured athlete. The injured athlete was asked to complete the Time 2 questionnaire. The

Time 2 questionnaire was identical to the Time 1 questionnaire. The Time 2 questionnaire was given to the injured athlete at the projected midpoint of the rehabilitation process. The participant was asked to answer each question truthfully and return the questionnaire.

Lastly, a final data collection occurred with all participants that completed Time 1 data. The primary researcher again arranged a meeting where the participant completed the Time 3 questionnaire. The Time 3 questionnaire was identical to the Time 1 and Time 2 questionnaires. All questionnaires were matched, the names were removed, and each packet was assigned an identification code.

Data Analysis

Following data collection, data was entered using the SPSS statistics program. Preliminary analysis included: descriptives, frequencies, and reliabilities for all scales. First, in order to determine if a difference existed between injured and non-injured athletes on perceived body image and sport commitment at Time 1, separate analyses of variance (ANOVAs) were conducted. In order to determine if a difference existed between injured and non-injured athletes on burnout at Time 1, a multivariate analysis of variance (MANOVA) was used.

Second, in order to determine if perceived body image, sport commitment, and burnout were dynamic and changed over time, a paired samples *t*-test was used. The data was split based on the participants' injury status at Time 1 – injured and non-injured. Then, separate *t*-tests were conducted to determine if perceived body image, sport commitment, and burnout changed from Time 1 to Time 3 for each group.

Third, for the 10 individuals that sustained an injury during the course of the study, two paired sample *t*-tests were conducted: Time 1 to Time 2, then Time 2 to Time 3. This would allow for analyses of changes in perceived body image from healthy to injured to healthy status. All analyses used $p < .05$ to determine significance.

APPENDIX D
PARTICIPANT MATERIALS

Informed Consent

UNIVERSITY OF NORTHERN IOWA HUMAN PARTICIPANTS REVIEW INFORMED CONSENT

Project Title: Body Image, Sport Commitment, and Burnout Levels in Injured Athletes

Name of Investigator(s): Erik C. Chaouch & Dr. Windee M. Weiss

Invitation to Participate: You are invited to participate in a research project conducted through the University of Northern Iowa. The University requires that you give your signed agreement to participate in this project. The following information is provided to help you make an informed decision about whether or not to participate

Nature and Purpose: The purpose of this study is to examine the relationship between body image, sport commitment, and burnout levels and their relationship to injury.

Explanation of Procedures: You will be asked to complete a baseline questionnaire measuring current body image, sport commitment levels. Then, as an injury occurs over the course of the year you will be asked to complete another questionnaire. At the conclusion of the study, the data will be kept on file and locked for five years after which the collected information will be discarded.

Discomfort and Risks: There are no foreseeable risks to participation.

Benefits: Participants may not receive any direct benefits from participating in the study.

Confidentiality: Information obtained during this study that could identify you will be kept confidential. The summarized findings with no identifying information may be published in an academic journal or presented at a scholarly conference.

Right to Refuse or Withdraw: Your participation is completely voluntary. You are free to withdraw from participation at any time or to choose not to participate at all, and by doing so you will not be penalized.

Questions: If you have questions about the study or desire information in the future regarding your participation you can contact Erik Chaouch at 763-218-4628 or the project

Questionnaire

Circle the answer that best describes how you
 ut competing in your sport

1. Do you want to keep competing in your sport?	Not at all	A little	Sort of	Pretty much so	Very much so
2. How hard would it be for you to quit your competitive sport participation?	Not at all	A little	Sort of	Pretty much so	Very much so
3. How determined are you to keep competing in your sport?	Not at all	A little	Sort of	Pretty much so	Very much so
4. How dedicated are you to competing in your sport?	Not at all dedicated	A little	Sort of	Pretty dedicated	Very dedicated
5. What would you be willing to do to keep competing in competitive sport?	Nothing at all	A little bit	A few things	Some things	A lot of things

Circle the best answer that describes your
 feelings about your body

6. I am comfortable with the appearance of my body	Not at all	A little	Sort of	Pretty much so	Very much so
7. I would never worry about wearing clothes that might make me look too thin or overweight	Not at all	A little	Sort of	Pretty much so	Very much so
8. I wish I wasn't so uptight about my body	Not at all	A little	Sort of	Pretty much so	Very much so
9. There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively.	Not at all	A little	Sort of	Pretty much so	Very much so
10. When I look in the mirror I feel good about my body	Not at all	A little	Sort of	Pretty much so	Very much so
11. Unattractive features of my body make me nervous in certain social settings	Not at all	A little	Sort of	Pretty much so	Very much so
12. In the presence of others, I feel apprehensive about my body	Not at all	A little	Sort of	Pretty much so	Very much so

13. I am comfortable with how fit my body appears to others	Not at all	A little	Sort of	Pretty much so	Very much so
14. It would make me uncomfortable to know others were evaluating my body	Not at all	A little	Sort of	Pretty much so	Very much so
15. When it comes to displaying my body to others, I am a shy person	Not at all	A little	Sort of	Pretty much so	Very much so
16. I usually feel relaxed when it is obvious that others are looking at my body	Not at all	A little	Sort of	Pretty much so	Very much so
17. When in a bathing suit, I often feel nervous about the shape of my body.	Not at all	A little	Sort of	Pretty much so	Very much so
Circle the answer that best describes how you feel					
18. I'm accomplishing many worthwhile things in sport	Almost never	Rarely	Sometimes	Frequently	Almost always
19. I feel so tired from my training that I have trouble finding energy to do other things	Almost never	Rarely	Sometimes	Frequently	Almost always
20. The effort I spend in sport would be better spent doing other things	Almost never	Rarely	Sometimes	Frequently	Almost always
21. I feel overly tired from my sport participation	Almost never	Rarely	Sometimes	Frequently	Almost always
22. I am not achieving much in sport	Almost never	Rarely	Sometimes	Frequently	Almost always
23. I don't care as much about my sport performance as I used to	Almost never	Rarely	Sometimes	Frequently	Almost always
24. I am not performing up to my ability in sport	Almost never	Rarely	Sometimes	Frequently	Almost always
25. I feel "wiped out" from sport	Almost never	Rarely	Sometimes	Frequently	Almost always
26. I'm not into sport like I used to be	Almost never	Rarely	Sometimes	Frequently	Almost always
27. I feel physically worn out from sport	Almost never	Rarely	Sometimes	Frequently	Almost always

28. I feel less concerned about being successful in sport than I used to	Almost never	Rarely	Sometimes	Frequently	Almost always
29. I am exhausted by the mental and physical demands of sport	Almost never	Rarely	Sometimes	Frequently	Almost always
30. It seems that no matter what I do, I don't perform as well as I should	Almost never	Rarely	Sometimes	Frequently	Almost always
31. I feel successful at sport	Almost never	Rarely	Sometimes	Frequently	Almost always
32. I have negative feelings toward sport.	Almost never	Rarely	Sometimes	Frequently	Almost always

Please Answer These Demographic Questions

33. What is your age? _____

34. What is your sex? Male Female

35. What is your ethnicity?

Caucasian/White African American/Black Latin/Hispanic Asian Other _____

35. What is your current sport?

Football Soccer Volleyball Swimming/Diving Golf
M-Basketball W-Basketball M-Track W-Track Tennis

36. Are you currently injured? Yes No

37. What is your current level of participation?

100% Full participation Limited Participation Not Participating

38. Are you currently in a rehab program for an injury?

Yes No

39. What part of the season are you in?

Preseason Regular Season Post-season/Playoffs Off-season

40. What is your playing status?

Starter

Non-starter

Red-shirt/Medical Hardship

41. What year of eligibility are you?

Freshman

Sophomore

Junior

Senior

Redshirt _____

REFERENCES

- Andersen, M. B., & Williams, J. M. (1988). A model of stress and athletic injury: Prediction and prevention. *Journal of Sport and Exercise Psychology*, *10*(3), 294-306.
- Beals, K. A., & Manore, M. M. (1994). The prevalence and consequences of subclinical eating disorders in female athletes. *International Journal of Sport Nutrition*, *4*, 175-195.
- Carpenter, P. J., & Coleman, R. (1998). A longitudinal study of elite youth cricketers' commitment. *International Journal of Sport Psychology*, *29*, 195-210.
- Carpenter, P. J., & Scanlan, T. K. (1998). Changes over time in the determinants of sport commitment. *Pediatric Exercise Science*, *10*, 356-365.
- Casper, J. M., & Andrew D. (2008). Sport differences among tennis players on the basis of participation outlet and skill level. *Journal of Sport Behavior*, *31*, 201-219.
- Crawford, S., & Ecklund, R. C. (1994). Social physique anxiety, reasons for exercise, and attitudes toward exercise setting. *Journal of Sport & Exercise Psychology*, *16*, 70-82.
- Cremades, J. G., & Wiggins, M. S. (2008). Direction and intensity of trait anxiety as predictors of burnout among college athletes. *Athletic Insight- the Online Journal of Sport Psychology*, *10*(2),
<http://www.athleticinsight.com/Vol10Iss2/TraitAnxiety.htm>
- Cremades, J. G., Wated, G., & Wiggins, M. S. (2011). Multiplicative measurements of a trait anxiety scale as predictors of burnout. *Measurement in Physical Education and Exercise Science*, *15*, 220-233.
- Cresswell, S. L. (2008). Possible early signs of athlete burnout: A prospective study. *Journal of Science and Medicine in Sport*, *12*, 393-398.

- Cresswell, S. L., & Ecklund, R. C. (2003). The nature of athlete burnout. The Abstracts of the 38th Conference of the Australian Psychological Society, 3, 173-174.
- Cresswell, S. L., & Ecklund, R. C. (2004). The athlete burnout syndrome: Possible early signs. *Journal of Sports Medicine*, 7, 481-487.
- Cresswell, S. L., & Ecklund, R. C. (2006a). Changes in athlete burnout over a thirty-week "rugby year." *Journal of Science and Medicine in Sport*, 9, 125-134.
- Cresswell, S. L., & Ecklund, R. C. (2006b). The nature of player burnout in rugby: Key characteristics and attributions. *Journal of Applied Sport Psychology*, 18, 219-239.
- Davis, C. (1992). Body image, dieting behaviors, and personality factors: A study of high performance female athletes. *International Journal of Sports Psychology*, 23, 179-192.
- Davis, C., Brewer, H., & Weinstein, M. (1993). A study of appearance anxiety in young men. *Social Behavior and Personality*, 21, 63-74.
- DeBruin, A.P. (2010). *Thin is going to win? Disordered eating in sport*. (Doctoral thesis, VU University, Amsterdam, The Netherlands). Retrieved from http://www.researchgate.net/publication/225151993_Weight-Related_Sport_Motives_and_Girls_Body_Image_Weight_Control_Behaviors_and_Self-Esteem/file/9fcfd510a578e93869.pdf
- DeBruin, A. P., Oudejans, R. R., & Bakker, F. C. (2007). Dieting and body image in aesthetic sports: A comparison of Dutch female gymnasts and non-aesthetic sport participants. *Psychology of Sport and Exercise*, 8, 507-520.
- DeBruin, A. P., Oudejans, R. R., Bakker, F. C., & Woertman, L. (2011). Contextual body image and athletes' disordered eating: The contribution of athletic body image to disordered eating in high performance women athletes. *European Eating Disorders Review*, 19, 201-215.

- Ecklund, R. C., & Crawford, S. (1994). Active women, social physique anxiety, and exercise. *Journal of Sport and Exercise Psychology, 16*, 431-448.
- Ecklund, R. C., Mack, D., & Hart, E. (1996). Factorial validity of the social physique anxiety scale for females. *Journal of Sport and Exercise Psychology, 18*, 281-295.
- Follo, G. (2007). The social and sporting body: Women in rugby and martial arts perceiving their body. *Abstracts of the 3rd Annual 2007 The Drake Conference*, Cleveland State University, (Cleveland, OH).
- Gay, J. L., Monsma, E. V., & Torres-McGehee, T. (2011). Development and contextual risks of social physique anxiety among female athletes. *Research Quarterly for Exercise and Sport, 82*, 168-177.
- Gould, D., & Dieffenbach, K. (2002). Overtraining, under recovery, and burnout in sport. In M. Kellmann (Ed.), *Enhancing recovery: Preventing underperformance in athletes* (pp. 25-35). Champaign, IL: Human Kinetics.
- Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996). Burnout in competitive junior tennis players: I. A quantitative psychological assessment. *The Sport Psychologist, 10*, 322-340.
- Greenleaf, C. (2002). Athletic body image: Exploratory interviews with former female competitive athletes. *Women in Sport and Physical Activity Journal, 11*, 63-88.
- Grobbelaar, H. W., Malan, D., Steyn, B. & Ellis, S. M. (2010). Factors affecting the recovery-stress, burnout and mood state scores of elite student rugby players. *South African Journal for Research in Sport, Physical Education and Recreation, 32*, 41-54.
- Grylls, E., & Spittle, M. (2008). Injury and burnout in Australian athletes. *Perceptual and Motor Skills, 107*, 873-880.

- Gustafsson, H., Kentta, G., Hassmen, P., & Johansson, M. (2007). Prevalence of burnout in competitive adolescent athletes. *The Sport Psychologist, 21*, 21-37.
- Hart, E., Leary, M. R., & Rejeski, W. J. (1989). The measurement of social physique anxiety. *Journal of Sport & Exercise Psychology, 11*, 94-104.
- Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitude characteristics, and symptoms. *International Journal of Eating Disorders, 18*, 317-326.
- Hurst, R., Hale, B., Smith, D., & Collins, D. (2000). Exercise dependence, social physique anxiety, and social support in experienced and inexperienced bodybuilders and weightlifters. *British Journal of Sports Medicine, 34*, 431-435.
- Jacobi, C., Hayward, C., DeZwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: Application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin, 130* (1), 19-65.
- Johnson, C., Powers, P. S., & Dick, R. (1999). Athletes and eating disorders: The National Collegiate Athletic Association study. *International Journal of Eating Disorders, 26*, 179-188.
- Johnston, L. H., & Carroll, D. (2000). The psychological impact of injury: Effects of prior sport and exercise involvement. *British Journal of Sport Medicine, 34*, 436-439.
- Krane, V., Waldron, J. J., Michalenok, J., & Stiles-ShIPLEY, J. (2001). Body image concerns in female exercisers and athletes: A feminine culture studies perspective. *Women in Sport and Physical Activity Journal, 10*, 17-54.
- Lemyre, P. N., Treasure, D. C., & Roberts, G. C. (2006). Influence of variability in motivation and affect on elite athlete burnout. *Journal of Sport and Exercise Psychology, 28*, 32-48.

- Loland, N. W. (1999). Some contradictions and tensions in elite sportsmen's attitudes towards their bodies. *International Review for the Sociology of Sport*, 34, 291-302.
- Marchant, D, Levy, A, & Clough, P. (2005) Exercise Dependence and Fat Phobia: pilot data. BASES Annual Conference, Loughborough.
- McAuley, E., Bane, S. M., Rudolph, D. L., & Lox, C. L. (1995). Physique anxiety and exercise in middle-aged adults. *Journal of Gerontology*, 50B, 229-235.
- McAuley, E., & Burman, G. (1993). The social physique anxiety scale: Construct validity in adolescent females. *Medicine and Science in Sports and Exercise*, 25, 319-328.
- Perriello, V. (2001). Aiming for healthy weight in wrestlers and other athletes. *Contemporary Pediatrics*, 18, 55.
- Petrie, T. A. (1996). Differences between male and female college lean sport athletes, nonlean sport athletes, and nonathletes on behavioral and psychological indices of eating disorders. *Journal of Applied Sport Psychology*, 8, 218-230.
- Picard, C. L. (1999). The level of competition as a factor for the development of eating disorders in female collegiate athletes. *Journal of Youth and Adolescence*, 28, 583-594.
- Raedeke, T. D. (1997). Is athlete burnout more than just stress? A sport commitment perspective. *Journal of Sport and Exercise Psychology*, 19, 396-417.
- Raedeke, T. D., Granzky, T. L., & Warren, A. (2000). Why coaches experience burnout: A commitment perspective. *Journal of Sport & Exercise Psychology*, 22, 85-105.
- Raedeke, T. D., Lunney, K., & Venables, K. (2002). Understanding athlete burnout: Coach perspectives. *Journal of Sport Behavior*, 25, 181-206.

- Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport & Exercise Psychology, 23*, 281-306.
- Raedeke, T. D., & Smith, A. L. (2004). Coping resources and athlete burnout: An examination of stress mediated and moderation hypotheses. *Journal of Sport & Exercise Psychology, 26*, 525-541.
- Russell, K. M. (2004). On versus off the pitch: The transiency of body satisfaction among female rugby players, cricketers, and netballers. *Sex Roles, 9*, 561-574.
- Scanlan, T. K., & Lewthwaite, R. (1986). Social psychological aspects of competition for male sport participants: IV. Predictors of enjoyment. *Journal of Sport Psychology, 8*, 25-35.
- Scanlan, T. K., & Simons, J. P. (1992). The construct of sport enjoyment. In G. C. Roberts. (Ed.), *Motivation in sport and exercise* (pp. 199-215). Champaign, IL: Human Kinetics.
- Scanlan, T. K., Simons, J. P., Carpenter, P. J., Schmidt, G. W., & Keeler, B. (1993). The sport commitment model: Measurement development for the youth-sport domain. *Journal of Sport and Exercise Psychology, 15*, 16-38.
- Schmidt, G. W., & Stein, G. L. (1991). Sport commitment: A model integrating enjoyment, dropout, and burnout. *Journal of Exercise Psychology, 8*, 254-265.
- Smith, A. L. (2004). Measurement of social physique anxiety in early adolescence. *Medicine & Science in Sports & Exercise, 36*, 475-483.
- Smith, R. E. (1986). Towards a cognitive-affective model of athletic burnout. *Journal of Sport Psychology, 8*, 36-50.
- Sundgodt-Borgen, J. (1993). Prevalence of eating disorders in elite female athletes. *International Journal of Sport Nutrition. 3*, 29-40.

- Weiss, W. M. (2011). Longitudinal analysis of sport commitment types: Does injury play a role. *International Journal of Sport Psychology*, *42*, 565-585.
- Weiss, W. M., & Weiss, M. R. (2003). Attraction- and entrapment-based commitment among competitive female gymnasts. *Journal of Sport & Exercise Psychology*, *25*, 229-247.
- Weiss, W. M., & Weiss, M. R. (2006). A longitudinal analysis of commitment among competitive female gymnasts. *Psychology of Sport and Exercise*, *7*, 309-323.
- Weiss, W. M., & Weiss, M. R. (2007). Sport commitment among competitive female gymnasts: A developmental perspective. *Research Quarterly for Exercise and Sport*, *78*, 90-102.
- Wiese-Bjornstal, D. M., Smith, A. M., Shaffer, S. M., & Morrey, M. A. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of Applied Sport Psychology*, *10*, 46-69.