

Relaxation and Guided Imagery in the Sport Rehabilitation Context

Loretta A. **Handegard**, A. Barry **Joyner**, Kevin L. **Burke**, and Bryan **Reimann**, USA

Loretta A. Handegard earned a Master of Science Degree in Kinesiology with an emphasis in Sport Psychology from Georgia Southern University. Loretta is currently an Academic Coordinator at Florida State University College of Medicine in Tallahassee, Florida. Her research and applied interests include the psychology of injury in youth and adult athletes, adherence to and motivation during rehabilitation, and transitioning back into play after an injury. Loretta has worked with a variety of youth and collegiate athletes and sports teams. She plans on pursuing her career goals of working with injured athletes by continuing her education with a Doctorate in Sport Psychology and perhaps a Doctorate in Physical Therapy. This study was conducted at Georgia Southern University as part of the Thesis requirement. For further information about this study, please contact Loretta via email: wire_to_wire@hotmail.com

Barry Joyner, Ph.D. is an Associate Professor in the Jiann-Ping Hsu School of Public Health at Georgia Southern University. His primary teaching responsibilities are in the areas of research methods and data analysis and research interests include prediction of human performance, youth fitness testing, and physical activity in children. Email: joyner@georgiasouthern.edu

Dr. Kevin L. Burke is Professor and Chair of the Department of Physical Education, Exercise and Sport Sciences at East Tennessee State University. His current research interests are in optimism/pessimism, momentum, humor, concentration, and personal control. Dr. Burke has assisted professional, college, high school, and recreational athletes from various sports as a sport psychology consultant, is a "Certified Consultant, AAASP" and Licensed Professional Counselor.

Bryan L Riemann, PhD, ATC is an Assistant Professor, Graduate Athletic Training Program Coordinator and Graduate Program Director in the Jiann-Ping Hsu School of Public Health. His articles appear in the Journal of Athletic Training, Medicine and Science in Sports and Exercise, Archives of Physical Medicine and Rehabilitation, Journal of Orthopedic and Sports Physical Therapy, American Journal of Sports Medicine and Journal of Sport Rehabilitation. Email: briemann@georgiasouthern.edu

Abstract

Sport injuries have been predicted to occur at a rate of 17 million per year, and 8 of 10 athletes become injured during high school and college (Robbins & Rosenfeld, 2001). Injured athletes may experience tension, loneliness, fear, shock/disbelief, and uncertainty of the future (Evan & Hardy, 2002b; Udry et al., 1997). Athletes also look towards the head and assistant coaches, athletic trainers, teammates, family and friends for social support during an injury (Gould et al., 1997a; Robbins & Rosenfeld, 2001). A qualitative and quantitative design was utilized to describe the effects of relaxation and imagery in the sport rehabilitation setting on self-confidence and fear of returning to sport. In addition, the possible relationships between perceived social support, self-confidence, and transition into play were investigated with modified versions of the State and Trait Sport Confidence Inventory (Vealey, 1986), Social Support Survey (Richman, Rosenfeld, & Hardy, 1993), and Sport Imagery Evaluation (Vealey & Greenleaf, 2001). Participants were 2 injured male collegiate athletes (soccer and baseball) with upper extremity injuries of moderate severity levels and an estimated recovery period of 2 weeks. Participants were given a specifically designed audiocassette tape of a guided imagery script, which was used twice daily. Results were processed and analyzed for any similarities and/or discrepancies between participants regarding the rehabilitation experience. Both experienced increases in self-confidence and moderate to high levels of social support. Participant 001 received the most amount of social support from the athletic trainer and significant other. Participant 002 received the most social support from the head coach. Neither participant was fearful to return to play.

The integrated model of psychological response to the sport injury and rehabilitation process mentioned three psychological responses: cognitive appraisals, emotional responses and behavioral responses (Wiese-Bjornstal et al., 1998). This integrated model combines the pre-injury model of Andersen and Williams (1988) with the post-injury model of Wiese-Bjornstal et al. (1995). In this model, cognitive appraisals are believed to influence and affect both the emotional and behavioral responses to sport injury (Wiese-Bjornstal et al., 1988). Daly, Brewer, Van Raalte, Petitpas and Sklar (as cited in Wiese-Bjornstal et al.) found support for this theory by observing that athletes' cognitive appraisals were significantly correlated with total mood disruption. Smith, Scott, O'Fallon, and Young also noted athletes with injuries lasting more than two weeks experienced more mood disturbance than

did other injured athletes (as cited in Wiese-Bjornstal et al.). However, the effects of injury on self-esteem, self-worth, self-confidence and self-efficacy are still unknown.

The sports medicine field is becoming more aware of the psychological factors that play such a fundamental role in the athletic injury process (Durso-Cupal, 1998), further exemplifying the importance of understanding this phenomenon. Nevertheless, the use of mental training interventions during rehabilitation has not been studied as frequently; nor are athletes usually given the opportunity to use psychological interventions for prevention, or rehabilitation coping (Durso-Cupal, 1998). The five psychological factors that have been empirically shown to positively contribute to the prevention of or physical recovery from injury in intervention based studies are: goal setting, psycho-

logical skills training, positive self-talk, knowledge/education, and social support (Durso-Cupal, 1998). Imagery, also called mental practice or rehearsal, may be used during injury rehabilitation to cope with pain, speed up recovery, give a positive outlook, keep physical skills from decreasing, and reduce both state and re-injury anxiety (Vealey & Greenleaf, 2001; Williams, Rotella, & Scherzer 2001).

In a study of recovery time while implementing mental imagery, Carroll (1993) found physical rehabilitation with imagery resulted in a faster recovery, a return that resembled a typical athlete profile on the Profile of Mood States Questionnaire (POMS), and perceived social support to be adequate than did physical therapy alone. However, the criteria used to determine the estimated recovery time was not provided. Carroll (1993) reported the intervention participants noted a greater sense of control and confidence due to the imagery training and attributed 26% of total recovery to the intervention, and an 80% belief that mental imagery is an effective aid to healing.

Magyar and Duda (2000) found that higher perceptions of social support might lead to higher self-confidence through messages given from the athletic training context, capabilities of the athletic trainer, and the degree of familiarity from the environment. Another way injured athletes seek social support is by turning to a teammate who has previously recovered from a similar injury (Gould et al., 1997a & b; Robbins & Rosenfeld, 2001) and model their behavior in a facilitative manner, with the use of role modeling and guidance. However, social comparison may also be detrimental to the recovery process if the athlete follows the bad habits and attitudes of others. Flint (1998) recommended the injured athlete be

able to remain close to the rest of the team during practice and rehabilitation as this may help the athlete feel valued and supported. The purpose of this study was to assess how a mental training program, consisting of relaxation with guided imagery, would help in the post-injury recovery process. The first research question was would the use of guided imagery increase self-confidence during rehabilitation in injured athletes? Secondly, would the use of guided imagery during rehabilitation decrease fear of returning to play? Third, what was the relationship between perceived social support and a more confident transition into play? Lastly, what was the relationship between perceived social support and self-confidence?

Methods

Participants

The participants (N = 2) in this study were selected from a Southeastern NCAA Division I university. One participant was a member of the soccer team and the other a member of the baseball team. The ages of the participants were 23 and 18, respectively, and both participants were male. One of the participants was African-American, while the other was Caucasian. The participants were a senior and starter while the other a freshman and reserve. Both participants were aware of relaxation and imagery, however, only one had several years of previous experience using imagery. However, neither of the participants had used imagery in the past during rehabilitation from an injury. Both participants had incurred injuries previously, however, one of the athletes had sustained six career injuries and the other only two career injuries.

The criterion for inclusion was the participants must sustain macrotrauma injuries. Macrotrauma injuries were defined as occur-

ring from a sudden discrete impact or force (Crossman, 2001; Flint, 1998). For this study, and for the criterion for inclusion, an injury was defined as being sport related, keeping a player out of practice or competition the day after an injury, requiring medical attention of any type (except for icing and wrapping) and all concussions, and nerve injuries.

Participants had upper, left extremity injuries (rotator cuff tendon tear, and fractured left radius) with moderate severity levels. The soccer player was a goalie; therefore, an upper extremity injury may affect the athlete's performance. The baseball player's injury was on the athlete's non-dominant, non-throwing arm. Severity levels were determined by the team physician and athletic trainer(s). Both participants' estimated recovery time was two weeks. The onset of injuries was during the pre-season and regular season, respectively.

Measures

Self-confidence.

A modified version of the Trait and State Sport-Confidence Inventory (M-TSCI and M-SSCI, respectively; Vealey, 1986) was used to assess each participant's level of self-confidence about performing specific tasks. The athletes responded to 13 items which were rated on a Likert scale ranging from 0 (not at all confident) to 10 (completely confident). The modified version of the SSCI has been found to be internally reliable with alpha levels of .98, .98, and .97 for the first, second, and third administrations respectively (Magyar & Duda, 2000). This modified version of the SSCI has not been reported to be valid. However, the original trait and state versions are high in validity (Vealey, 1986).

Perceived Social Support.

To measure an athlete's perceived social support a modified version of the Social Support Survey (M-SSS; Richman, Rosenfeld & Hardy, 1993) was used. Richman, Rosenfeld, and Hardy developed the Social Support Survey as a means to provide the practitioner and researcher with a comprehension of the social support process as well as an assessment method to plan the intervention. The SSS and many of the modified forms have been found to be valid (Robbins & Rosenfeld, 2001).

Robbins and Rosenfeld (2001) modified the original SSS to measure social support during athletic injury. Two of the eight types of social support were removed due to the inapplicability of the population at hand: tangible support (financial, products or gifts) is against NCAA rules, and personal support (running errands or driving) had been found to be irrelevant to athletes during previous interviews. Each athlete was asked to rate perceived social support in three ways: (a) if the head coach, assistant coach, and athletic trainer provided each of the six types of social support, if the answer is 'no' then the athlete would not answer the following questions for that type of support; (b) rate satisfaction with the social support provided, pre- and during injury; and (c) rate perceived importance of each type of social support in relation to well-being, pre- and during injury. Robbins and Rosenfeld also excluded any questions asking the difficulty athletes would have in receiving more of any of the types of social support.

Mental Imagery

The Sport Imagery Evaluation (SIE; Vealey & Greenleaf, 2001) was administered to assess each athlete's ability to experience the different senses, emotions, and perspectives during imagery on a 5-point Likert Scale,

ranging from 1 (*None*) to 5 (*High*). Four imagery situations were included to provide a variety for imagery exposure and are: practicing alone, practicing with others, playing in a contest, and recalling a peak performance. There was no reliability or validity reported for this inventory. The information gathered was used to obtain a baseline of ability to further understand the participants' strengths and weaknesses.

Exit Interview.

After the athletes returned to play, each participated in a qualitative exit interview (see Appendix A). The interview assessed the participants' perceptions of the mental training program and the effectiveness in relation to the rehabilitation process and confidence in the ability to perform. The following are examples of questions used to obtain these perceptions:

“Please describe, in detail, the impact injury had on you personally (i.e., confidence, relationships with non-teammates, etc.). Now describe the impact injury had on you as an athlete (i.e., performance, confidence, relationships with teammates, etc.). How do you think the relaxation and imagery interventions helped your recovery process? Think back prior to your injury, how would you describe your self-confidence in sport? How do you think your self-confidence in sport was affected after the injury occurred?”

Perceived social support was assessed through questions similar to, “What kind(s) of support do you think were most beneficial during your rehabilitation? Can you describe what made that type of support(s) useful to you?” The exit interview also examined fear of re-injury, and the overall injury rehabili-

tation experience. The participants were asked, “On your first day back to play, were you afraid of re-injury? Describe any thoughts or worries you had. Presently, are you concerned of afraid of re-injury at this point? Describe any thoughts or worries you have.”

Procedures

As athletes became injured and met the criteria for inclusion, the researcher was contacted, by the athletic trainer, in person or by telephone, and the athlete was asked to participate in the study within 48 hours of the initial contact with the researcher. Once the athlete agreed to participate, a consent form was provided and a brief explanation given. All interactions with the athletes occurred during physical therapy, shortly before or after completion of therapy and in the presence of the athletic trainer, when appropriate. The researcher introduced relaxation and imagery to each participant by explaining how the intervention may help in the recovery process, followed by three consecutive training sessions.

The first administration of the SIE (Vealey & Greenleaf, 2001) determined the imagery level of the participants and allowed the participants to practice the imagery. The athletes were then instructed on how to improve imagery skills and meetings were scheduled for the following two days for further imagery needs assessment through the completion of the SIE and imagery practice. Based on the inventory results, each participant received an individualized mental training program consisting of relaxation and guided imagery, which was developed following the guidelines provided by Vealey and Greenleaf (2001) and was structured by the script examples used in Carroll's (1993) and Durso-Cupal's (1997) studies as well as recommendations pro-

vided by Crossman (2001). (Refer to Appendix B for the relaxation and imagery rehearsal script used with each participant.) Imagery was used just prior to or after physical therapy sessions as well as throughout each day at the athletes' convenience, twice a day for 15 minutes aided by audiocassette or guided by the researcher. Imagery sessions included thoughts of healing the injured area and overall body wellness. The participants were also asked to keep an imagery log provided by the researcher.

Packets of the inventories contained each participant's number code on the inside of the envelope seal and on each inventory for identification. The first packet containing the Demographic Questionnaire, SIE, M-TSCI and M-SSCI, and the M-SSS was administered during the initial meeting during the early stages of rehabilitation. The second packet contained only the SIE and was administered after the second and third imagery training sessions. The third, and fourth packets contained the SIE, M-SSCI, and the M-SSS and was administered at the estimated mid-point and end of the athletes' rehabilitation process, respectively. Finally, the fifth packet containing the M-TSCI and M-SSCI, the M-SSS, and the exit interview were completed approximately one week after the completion of rehabilitation and the participants returned to full play.

Due to the explorative nature of this study, each participant's results were explained through case study design, using graphical representations of the data to show changes in levels of perceived social support and self-confidence over time, in respect to the intervention. A qualitative interview was also used in the time following the athletes' transition back into play. The qualitative data was transcribed and compared for

common themes between participants about the rehabilitation process and the transition back into play. The transcribed data were also used to verify and further support the data gathered through the quantitative analysis. Triangulation occurred through the analysis of quantitative data, the daily imagery logs as well as the qualitative interview. Results were analyzed for increases in self-confidence, a more confident transition into play, and the possibility of a relationship between the previously mentioned variables with perceived social support.

Results

The participants recorded the number of imagery sessions and what was experienced through the completion of daily imagery logs. Both participants implemented the intervention twice daily for a total of 25 minutes per day. The imagery audiocassette tape was listened to most frequently after physical therapy, or practice, in the morning and at night, by both participants. The hardest imagery skill both participants experienced was the sense of smell during imagery. However, the imagery script was not designed for smell to be utilized. Feelings and sensations in and around the injured area, for both participants, were experienced about three days after the beginning of the intervention. Both participants also recorded being able to see the injured tendon or bone, being able to visualize that area better towards the end of the study, and also being able to visualize the mending or healing of the injured part.

Participant 001

Upon initial contact with Participant 001, he had not been pulled out of practice yet and had been attending some rehabilitation. However, due to repeated falls during practice, the partial rotator cuff tear was in jeopardy of becoming worse thus needing sur-

gery. At this point, Participant 001 had experienced increased pain levels and was pulled from full practice, although he was allowed to continue training.

Sport Imagery Evaluation

At the beginning of the study and during the exit interview, Participant 001 mentioned he had previous experiences with imagery. Participant 001's imagery skills, as measured by the SIE, were somewhat consistent across the four situations. Situation 3, playing in a contest, increased from a score of 12 (Time 3) to 24 (Time 4). The SIE scores also show that Participant 001's imagery skills were highest within situation 4, recalling a peak performance, across Time except for Time 4, where playing in a contest obtained the highest imagery skill score. The last administration of the SIE occurred once rehabilitation was completed and the participant was cleared to full play (Time 5). The scores at Time 5 resembled and exceeded the scores at Time 1, across all four situations.

Participant 001 stated he felt the most was received from the imagery session when it occurred right after his rehabilitation, "...when I was doing my rehab [imagery] during the day or after practice or in the morning...around the time where my shoulder was focused on, it helped a lot. I had vivid imagery and I felt like something was being done." In reference to relaxation, he stated that just relaxing at night really helps. "...When I am by myself, lying down my thoughts are all over the place. But when I have something to listen to it makes me focus on one idea and relaxes me." When asked what he liked about the intervention, he said "I liked the fact that it helped me when I actually needed it. I actually felt like I was doing something that made a difference...after doing it over and over [the imagery] I really saw my muscle fibers and felt

it tingle and [thought] 'whoa, I am actually doing something'!"

Trait and State Sport-Confidence

The participant's trait sport-confidence was measured at the initial meeting (Time 1) with a high score of 111 out of a possible 117, as well as one week post completion of rehabilitation (Time 4) with a score of 105. The average of the two administrations ($M = 108$, $SD = 3$) was used as a baseline for Participant 001's trait sport-confidence. Before injury, Participant 001 stated in the exit interview, that it was very high, a 10 on a scale of 1 to 10. He also felt that his confidence levels were affected after the injury occurred. He said, "I was worried that I might not get back to the way it was before...it took a really long time to heal."

Participant 001's state sport-confidence increased across time throughout rehabilitation, but his state sport-confidence scores were lower than both trait sport-confidence scores at Times 1 and 2. His state sport-confidence increased beyond his trait sport-confidence scores at Time 3 with a score of 115. The last administration of the M-SSCI yielded a score that remained higher than both trait sport-confidence scores. These findings were reflected in the exit interview as well. The participant stated, "I knew that I couldn't do things that I could do before. So confidence was limited...it's frustrating."

Head Coach Social Support.

Prior to the onset of Participant 001's injury, the head coach was perceived as providing all of the different types of social support except Emotional Support. The participant was most satisfied ($M = 4$) for Listening Support and least satisfied ($M = 2$) for Reality Confirmation. Throughout rehabilitation, the participant perceived the head coach as providing Listening Support only at Time 1,

beginning of rehabilitation, with moderate levels of satisfaction and importance. Task Challenge was perceived to be provided by the head coach at Time 1 and Time 3, completion of rehabilitation only, with moderate satisfaction and importance levels for both times. Participant 001 perceived to receive Emotional Support from the head coach at the beginning of rehabilitation only (Time 1) with moderate satisfaction and importance levels. Participant 001 did not perceive the head coach to be providing Task Appreciation, Emotional Challenge, or Reality Confirmation during rehabilitation. The qualitative data was replicated during the exit interview.

Assistant Coach Social Support

The assistant coach was perceived to be providing Participant 001 with all six types of social support prior to the onset of injury. Listening Support deemed the most satisfaction ($M = 3.75$) while Reality Confirmation held the least amount of satisfaction ($M = 3.5$). During the entire rehabilitation from the injury, Participant 001 perceived to receive Listening Support from the assistant coach and felt completely satisfied at Time 1. However, the participant's perception of Listening Support importance varied quite differently from the satisfaction. Time 2 deemed the most important for receiving Listening Support from the Assistant coach, nonetheless that was also the time Participant 001's satisfaction with the perception of support received was the least. Task Challenge was perceived to be provided only at Time 1, but the participant was completely satisfied with the support during that time. The importance for receiving this type of support for the participant at Time 1 was moderate. Satisfaction with Emotional Support was moderate at Time 1 and Time 4, which were also the only times that this type of support was perceived to be given. Re-

ceiving Emotional Support was moderate for both times, however, it was perceived more important at Time 4. Receiving Reality Confirmation was very important for Participant 001 at Time 3. Although his satisfaction level was high, the perceived importance of receiving Reality Confirmation was higher. The assistant coach was not perceived to have provided Task Appreciation or Emotional Challenge during rehabilitation. Participant 001's interview resembled the data collected quantitatively.

Athletic Trainer Social Support

Prior to injury occurring, the participant did not perceive the athletic trainer as giving any type of support. However, during rehabilitation the athletic trainer provided Listening Support, Task Appreciation, Task Challenge, and Reality Confirmation across all four times. Receiving Listening Support was most important at Time 1 and most satisfied with at Time 2 and Time 3. Participant 001 perceived receiving Task Appreciation as most important at Time 2, and Time 4. Task Challenge was perceived to be satisfactory and important from the athletic trainer, with Time 4 receiving moderate levels of both. The importance of receiving Reality Confirmation was greater than the participant's satisfaction only at Time 2. Emotional Support received high levels of satisfaction and importance equally at Times 1, 2, and 4. Emotional Challenge was perceived to have been provided at Time 2, Time 3, and Time 4. However, the importance of receiving this support was greater than the level of satisfaction at Time 3. The participant expressed these findings during the exit interview as well. He felt that the athletic trainer provided the most amount of support during rehabilitation and was mainly informative. He also felt, "while injured social support is 10 times more important than any other time."

Transition into Play.

Participant 001 did not experience fear or anxiety when he returned to play. He said, “I was worried but...I did not want to injure it again. Consciously I was not [hesitating], but I might have favored my right side.” He further explained that although the thought was in his mind, it did not affect his play and that fear or anxiety was not present.

Relationship Between Social Support and Transition into Play.

There may be a positive relationship between being moderately to highly satisfied with the social support given and not experiencing fear or anxiety when returning to play. Another positive relationship that was noticed was receiving most of the support from the Athletic trainer during rehabilitation, being highly satisfied with it, and not experiencing fear when returning to play.

Relationship Between Social Support and Self-Confidence.

There may be a positive relationship between receiving and being satisfied with the social support needed, and sustaining prior levels, or increasing the levels of self-confidence. The participant demonstrated both high levels of self-confidence when he returned to play and satisfaction with the social support perceived to have received.

Participant 002

Initial contact had been made with Participant 002 several weeks prior to starting the intervention with him. He had fractured his left radius while diving for a baseball and was in a cast for approximately 6 weeks, while not practicing or participating in therapy. Once removal of the cast approached, contact was made again. Participant 002's left wrist was then put into a soft splint and he began strengthening exercises. From this

point rehabilitation was estimated to last 2 weeks.

Sport Imagery Evaluation.

During the exit interview, Participant 002 mentioned he had very little previous experience with relaxation and imagery. Nonetheless, Participant 002's imagery skills, as measured by the SIE, were moderate to high and remained fairly stable across time and all four situations. Situation 4, recalling a peak performance, consistently scored the highest among all four situations. The other three situations, practicing alone, practicing with others, and playing in a contest, respectively, were very similar in imagery abilities. During the last administration, after completion of rehabilitation (Time 5), situation 1 slightly decreased with a score of 26 while situations 2 and 3 remained fairly stable.

Participant 002 felt the intervention helped him return to full play status. “...During the time when I couldn't do anything it helped to kind of think about what I was going to do when I got back out on the field. Prepare me a little better than just going out there...the imagery was one of the main things I thought worked.” He mentioned the imagery sessions were easier to follow with the audiocassette tape or the researcher, than if he were to do it on his own. Also, the imagery that helped him the most were the four situations measured by the SIE, “...because I was specifically thinking about what I was doing, fielding or hitting.”

Trait and State Sport-Confidence.

The participant's trait sport-confidence was measured at the initial meeting (Time 1) with a high score of 102 out of a possible 117, as well as one week post completion of rehabilitation (Time 4) with a score of 113. The average of the two administrations ($M =$

107.5, SD = 5.5) was used as a baseline for Participant 002's trait sport-confidence. During the exit interview, Participant 002 rated his confidence prior to injury as an eight or nine on a scale of 1 to 10. However, during rehabilitation, his confidence did not lower until he began practicing more with the team. "...it did not affect my confidence until right now [when the cast came off and physical activity increased]. I got to kind of build myself back up. I am coming back into it; I got to build my confidence back up." He rated his confidence as a six or seven in this situation. This is reflected in the quantitative data, measured by the M-TSCI and M-SSCI, due to the intervention beginning once the cast was removed.

Participant 002's state sport-confidence was measured across four times throughout rehabilitation and revealed scores that were slightly lower than the averaged trait sport-confidence score at Time 1 and Time 2. Participant 002's state sport confidence scores increased through Time 3, then slightly decreased at Time 4, however, is still higher than the averaged trait sport-confidence score.

Head Coach Social Support.

Prior to the onset of Participant 002's injury, the head coach was not perceived as providing all of the different types of social support, except Emotional Challenge and Reality Confirmation, equally. Throughout rehabilitation, the head coach provided Listening Support across time and was perceived to be very satisfactory and important. Task Appreciation was perceived to be provided by the head coach as more satisfying at Time 1 and Time 2. Task Challenge was highly satisfactory and important during both Time 1, and Time 3. Participant 002 perceived receiving very satisfactory and important Emotional Support from the head

coach throughout rehabilitation, however, the lowest satisfaction occurred at Time 3. Participant 002 did not perceive the head coach to be providing Emotional Challenge, or Reality Confirmation during rehabilitation. During the exit interview, the participant expressed receiving Listening and Emotional Support from the head coach the most during rehabilitation, "My head coach really did...provide me with support. Basically him, he was the main guy."

Assistant Coach Social Support.

The assistant coach was perceived as providing Participant 002 with Listening Support, Task Appreciation and Task Challenge prior to the onset of injury. Listening Support was most satisfactory (M = 4) while the other two types of support were equally satisfactory (M = 3.5). During the entire rehabilitation from the injury, Participant 002 perceived receiving Listening Support from the assistant coach across time, with Time 3 showing the lowest satisfaction. Task Appreciation was highly satisfactory and important during Time 1, and Time 2, with the highest satisfaction found at Time 1. Emotional Support was perceived as being provided at Time 1 and Time 2 only. Participant 002 perceived this type of support to be very important at Time 2, and highly satisfactory during both administrations. The assistant coach was not perceived as providing Task Challenge, Emotional Challenge, or Reality Confirmation during rehabilitation. The qualitative interview supported the M-SSS findings for the assistant coach as it did for the head coach.

Athletic Trainer Social Support.

Prior to injury occurring, the participant perceived the athletic trainer as only giving Listening Support - however, he was highly satisfied. During rehabilitation the athletic trainer was perceived as providing very sat-

isfactory Listening Support across all four times with scores of 5. Participant 002 perceived receiving Task Appreciation was very satisfactory and important at Time 1, and Time 3, however, was not as high at Time 2. Task Challenge was deemed very satisfactory and important from the athletic trainer equally at Time 3, and Time 4. The participant perceived to receive Emotional Support from the athletic trainer at Time 1, Time 2, and Time 3, which had the lowest satisfaction and importance. The athletic trainer did not provide Emotional Challenge or Reality Confirmation. The participant expressed these findings during the exit interview. The athletic trainer "...kept me going and told me, if I thought it was taking forever, to just stick with it. He just helped me get through it..." Participant 002 also perceived receiving Listening Support from his family members and friends. The participant also mentioned that receiving social support was more important during the injury than it was prior to becoming injured.

Transition into Play.

Participant 002 did not express having fear or anxiety returning to play during the exit interview. He stated, "No, I wasn't really afraid. Cause I knew...I have done the necessary things in rehabilitation...I did not hold back." He continued to say that when the cast was first removed, there was a little bit of concern, however, he was confident and did not hold back or hesitate.

Relationship Between Social Support and Transition into Play.

During the exit interview he mentioned that his athletic trainer and head coach were providing him with the support he needed, which resembled the data gathered through the M-SSS. There may be a positive relationship between being moderately to highly satisfied with the perceived social support

and not experiencing fear or anxiety when returning to play. Another positive relationship, similar to that of Participant 001, was perceiving the athletic trainer as providing most of the support during rehabilitation, being highly satisfied with it, and not experiencing fear when returning to play.

Relationship Between Social Support and Self-Confidence

A positive relationship may have occurred between perceiving to receive and being satisfied with the social support needed, and sustaining prior levels, or increasing levels of self-confidence. The participant demonstrated, and mentioned through the exit interview, having high levels of self-confidence when he returned to play and satisfaction with the support he received.

Discussion

The research questions examined by this study were supported by the results obtained quantitatively, qualitatively as well as through the completion of the daily imagery logs. The information from these logs contributed to triangulation of the data. The purpose of this study was to assess if a mental training program could affect the post-injury recovery process, perceived social support as measured by the Modified Social Support Survey, and self-confidence as measured by the Modified Trait and State Sport-Confidence Inventory as well as qualitative questions.

Adequate training in the use of relaxation and imagery may help to improve the benefits received from the intervention. The participants in this study had different imagery experiences; however, with the imagery practice sessions this did not seem to be a factor. The participants' imagery skills were relatively similar in that by the end of the mental skills training program, their imagery

skills remained stable or improved when compared to the beginning of the program. Both participants showed higher imagery skills when recalling a peak performance in comparison to the other three situations. Participant 001's imagery skills varied from Time 2 through Time 4. However, by providing the participant with Listening Support during the intervention and through the qualitative questions, there was a factor that may have influenced his imagery scores. At the time Participant 001 completed the SIE, Participant 001 stated, he had been dealing with conflict between other team members and he had trouble concentrating on imagery those times. Had he not been mentally distracted with other thoughts, his SIE scores may have resembled Time 1 and Time 5, thus more stable scores across time.

Both participants attributed 30 - 40 % of their recovery from the injury to the mental training program. This supported Carroll (1993) with the intervention group attributing 26% of rehabilitation to the imagery intervention and is in agreement with previous research that found imagery to positively contribute to the injury rehabilitation process (Durso-Cupal, 1998; Williams, Rotella & Scherzer, 2001; Zinsser et al., 2001). One of the participants stated, "It helped my recovery...I don't know how it works...I just feel tingly and I just know that something is going on that was not going on before I started imagery." Both participants expressed an interest in using these techniques again in the event of another injury.

Both participants expressed being concerned, but not having a fear to return to play. Participant 001 had played in his first pre-season game a few days prior to the exit interview and was not hesitant or experienced fear of any kind. A difference between the two participants was the timing of

the injury. Participant 001's injury occurred during the pre-season, while Participant 002's injury occurred at the beginning of the regular season. Injury onset for both participants occurred at a time where there was typically less pressure on the athlete to recover quickly. As Crossman (2001) mentioned, the timing of the injury may influence the injury coping process and the athlete may experience more psychological effects the longer rehabilitation takes (Wiese-Bjornstal et al., 1998).

Other factors may have contributed to the results of this study, thus warranting further exploration. First, Participant 001 was a senior in college, while Participant 002 was a freshman. This could have been a motivating factor for Participant 001 to recover fully and quickly. Whereas for Participant 002, this could help to explain his lower level of concern while he was in the cast. The number of previous injuries may also have affected the results. While the injury experience for Participant 001 was new and at times "tedious", he had experienced more than six previous injuries. Thus possibly having a greater understanding of what it takes to recover successfully. Participant 002 also knew what to expect from the rehabilitation process having gone through it once before with a similar injury.

If an athlete returns to competition, without being psychologically prepared or ready to do so, fear of re-injury may result in anxiety and negative cognitive appraisals, which may increase the chances of re-injury (Williams & Andersen, 1998). Flint (1998) stated that effective recovery might be hindered by the dual role of the mind/body relationship and by not having trust or confidence in individual capabilities. The influence of cognitive appraisals has been documented as having an affect on the physical outcome of

rehabilitation. Future research may focus attention on how injured athletes may enhance the rehabilitation process through the systematic use of mental skills training. Future studies should also include a more diverse sample by including both male and female athletes from team and individual sports. Also, the timing of the injury and the severity levels should be further explored to better understand the effects on the injury rehabilitation experiences.

The results of this study may not be fully attributed to the intervention and must be taken with caution. These results indicated associations and similarities between the factors and participants, however, cause and effect cannot be determined. The inclusion of control groups may increase the understanding of the effects of mental skills training during rehabilitation from an injury. However, Flint (1998) recommended that severity levels and the manner in which severity is determined be consistent so that the results can be comparable between groups and studies.

Considering the number of athletes who become injured, this area of research provides possible psychological rehabilitation skills that athletes can implement to enhance the rehabilitation process. When dealing with injured athletes, imagery may help control pain, reduce anxiety levels, and develop positive attitudes as well as self-awareness, thus contributing to the healing process. Crossman (2001) stated the type of imagery most beneficial during the immediate post injury phase of rehabilitation is body rehearsal. This technique involves healing images, which allow athletes to have control by visualizing the healing process. This was exemplified with both participants in this study. Also, coping rehearsal and body rehearsal, that follows physical recovery, is

best suited for the early to progressive rehabilitation stages. During the last stage, advanced rehabilitation, mastery rehearsal that mimics physical recovery may help with the return to sport.

Athletic trainers may also benefit from this type of research and apply the psychological skills during physical therapy. For example the participants thought the most important support during injury came from the athletic trainers. The biggest variable lacking from Participant 001 in the training room was the lack of feedback on progression from the athletic trainer throughout therapy. More feedback during the week(s) might help the athletes feel more involved in the rehabilitation process. It may also help athletes to know specifically why they are still sitting on the bench even though they feel better. This may help prevent re-injury due to over exertion of activities prior to approval by the medical staff. The athletic training staff could help reduce or maintain pain, inflammation and swelling that typically accompanies injury through the systematic relaxation of muscle groups in all stages of rehabilitation.

The information in this study also provides coaches and other support providers with helpful information on providing social support during an injury. Both participants expressed receiving social support during an injury as more important than prior to becoming injured. Coaches, head and assistant, could enhance the injury process for athletes by knowing what kinds of support are needed and when to give it. For example one participant said it was important to know that his head coach was not mad at him. Confirmation from the coaching staff could lessen any guilt felt by the athlete or frustration felt because of mixed signals. The other participant expressed importance in receiv-

ing support from the coaching staff. “...Just to know that they cared and they weren’t forgetting about me because I was injured...to know that they still cared about my well being.” The injured athlete is already experiencing a wide range of emotions because he/she is not actively participating. The more stress that can be reduced through communication could benefit the overall rehabilitation process. Communicating prop-

erly is an effective method of showing care and support (Hardy, Burke, & Crace, 2004).

The results from this study are also socially valid, as both participants perceived the intervention as beneficial to the rehabilitation process by providing them with a skill they could control and perceived the intervention as improving their physical recovery.

References

- Andersen, M. B. & Williams, J. M. (1988). A model of stress and athletic injury: Prediction and prevention. *Journal of Sport & Exercise Psychology, 10*, 294-306.
- Carroll, S. A. (1993). Mental imagery as an aid to healing the injured athlete. Unpublished master's thesis, San Diego State University, California.
- Crossman, J. (2001). *Coping with sport injuries: Psychological strategies for rehabilitation*. New York: Oxford University Press.
- Durso-Cupal, D. D. (1997). The efficacy of guided imagery for recovery from anterior cruciate ligament (ACL) replacement. Unpublished doctoral dissertation, Utah State University, Utah.
- Durso-Cupal, D. (1998). Psychological intervention in sport injury prevention and rehabilitation. *Journal of Applied Sport Psychology, 10*, 103-123.
- Evans, L., & Hardy, L. (2002a). Injury rehabilitation: A goal-setting intervention study. *Research Quarterly for Exercise and Sport, 73*, 310-319.
- Flint, F. A. (1998). Integrating sport psychology and sports medicine in research: The dilemmas. *Journal of Applied Sport Psychology, 10*, 83-102.
- Gould, D., Udry, E., Bridges, D., & Beck, L. (1997a). Coping with season-ending injuries. *The Sport Psychologist, 11*, 379-399.
- Gould, D., Udry, E., Bridges, D., & Beck, L. (1997b). Stress sources encountered when rehabilitating from season-ending ski injuries. *The Sport Psychologist, 11*, 361-378.
- Hardy, C. J., Burke, K. L., & Crace, R. K. (2004). Coaching: An effective communication system. In S. Murphy, (Ed.), *The sport psych handbook*. Champaign, IL: Human Kinetics.
- Magyar, T., M., & Duda, J. L., (2000). Confidence restoration following athletic injury. *The Sport Psychologist, 14*, 372-390.
- Richman, J. M., Rosenfeld, L. B., & Hardy, C. H. (1993). The Social Support Survey: a validation study of a clinical measure of the social support process. *Research on Social Work Practice, 3*, 288-311.
- Robbins, J. E., & Rosenfeld, L. B. (2001). Athlete's perceptions of social support provided by their head coach, assistant coach, and athletic trainer, pre-injury and during rehabilitation. *Journal of Sport Behavior, 24*, 277-298.
- Udry, E., Gould, D., Bridges, D., & Beck, L. (1997). Down but not out: Athlete responses to season ending injuries. *Journal of Sport & Exercise Psychology, 19*, 229-248.

Vealey, R. S., (1986). Conceptualization of sport-confidence and competitive orientation: Preliminary investigation and instrumentation development. *Journal of Sport Psychology*, 8, 221-246.

Vealey, R. S., & Greenleaf, C. A. (2001). Seeing is believing: Understanding and using imagery in sport. In J. M. Williams, (Ed.), *Applied sport psychology: Personal growth to peak performance* (pp. 247-283). Mountain View, CA.: Mayfield Publishing Co.

Wiese-Bjornstal, D. M., Smith, A. M., & LaMott, E. E. (1995). A model of psychological response to athletic injury and rehabilitation [Special feature]. *Athletic Training: Sports Health Care Perspectives*, 1, 17-30.

Wiese-Bjornstal, D. M., Smith, S. 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.

Williams, J. M., & Andersen, M. B. (1998). Psychological antecedents of sport injury: Review and critique of the stress and injury model. *Journal of Applied Sport Psychology*, 10, 5-25.

Williams, J. M., Rotella, R. J., & Scherzer, C. B. (2001). Cognitive techniques for building confidence and enhancing performance. In J. M. Williams, (Ed.), *Applied sport psychology: Personal growth to peak performance* (pp. 456-479). Mountain View, CA.: Mayfield Publishing Co.

Zinsser, N., Bunker, L., & Williams, J. M. (2001). Cognitive techniques for building confidence and enhancing performance. In J. M. Williams, (Ed.), *Applied sport psychology: Personal growth to peak performance* (pp. 284-311). Mountain View, CA.: Mayfield Publishing Co.

Appendix A
Exit Interview Guide

1. Please describe, in detail, the impact injury had on you personally. (i.e., confidence, relationships with non-teammate, etc.)
Probe: How did it make you feel?
2. Now describe the impact injury had on you as an athlete. (i.e., performance, confidence, relationships with teammates, etc.)
3. Think back prior to your injury, how would you describe your self-confidence in sport? If you had to rate it on a scale of 1 to 10, where would it be?
4. How do you think your self-confidence in sport was affected after the injury occurred?
5. Please describe the physical therapy experience in relation to this injury.
Probe: What was most difficult? What were good/bad days like?
6. Describe what kind of information your athletic trainer gave you as you went through physical therapy. Describe what information you would have liked to receive?
Probe: Information about the injury or rehabilitation exercises, and progression through rehabilitation, etc.?
7. Now let's talk about social support. What kind(s) of support do you think were most beneficial during your rehabilitation? Can you describe what made that type of support(s) useful for you?
Probe: tangible, listening, task, emotional?
8. Who do you feel was providing you with the social support you needed? Can you describe who was providing each type of support?
Probe: coaches, athletic trainers, teammates, family, or friends?
9. Can you describe if receiving social support was more important to you before the injury occurred, during rehabilitation, or both equally? Why?
Probe: Do certain people provide support at different times?
10. Looking at your responses on the social support survey, I noticed you did not receive _____ support from _____ pre-injury/during rehabilitation. Can you reflect on that?
11. Now let's switch to relaxation and imagery. Were you familiar with the relaxation and imagery techniques used before participating in this study?
Probe: Describe your experiences with the techniques.
12. Please describe your experience with the relaxation and imagery sessions used in this study.

Probe: Were the relaxation and imagery sessions difficult/easy?
 What did you like best? What did you like least?
 Did the sessions help rehabilitation?
 Which parts of the sessions with me were most helpful?
 Can you think of any images used that were most helpful to you?

13. Did you use imagery on your own at all throughout rehabilitation?
 Probe: If so when or how often?
14. If given the opportunity to go back in time, would you use relaxation and imagery during rehabilitation, having had this experience? Why or why not?
15. Do you think you will continue to use relaxation and imagery in other aspects of sport?
 Probe: If so what aspects could benefit?
16. How do you think the relaxation and imagery interventions helped your recovery process?
 Probe: Can you estimate what percentage of your recovery is due to physical therapy and imagery?
17. On your first day back to play, were you afraid of re-injury?
 Probe: Rate the level of anxiety about re-injury on a scale of 0 (*having no worries*) to 10 (*having great amounts of worries*).
 Describe any thoughts or worries you had.
18. Presently, are you concerned or afraid of re-injury at this point?
 Probe: Rate the level of anxiety about re-injury on a scale of 0 (*having no worries*) to 10 (*having great amounts of worries*).
 Describe any thoughts or worries you had.
19. Is there anything else you would like to add that I have not covered regarding any of the topics we spoke about today?

Appendix B
Relaxation and Imagery Rehearsal Script

[This script will be modified for each participant's individual needs. Type of injury, recovery status and imagery ability will be the factors contributing to changes of the script. As rehabilitation progresses, the script will also progress accordingly.]

Please sit or lie down comfortably with your legs and arms unfolded, and your eyes closed. Start to become aware of your breathing and how your body feels at this moment. Inhale through your nose and exhale through your mouth, taking slow, deep breaths. Let any distracting thoughts or sounds enter and exit your mind freely, do not try to force any thoughts. I am going to guide you through your next breath, inhaling slowly for a count of four, hold for a count of two and finally release for a count of four. Ok, Inhale **[count in seconds]** 1, 2, 3, 4, hold 1, 2, and release 4, 3, 2, 1. **[repeat]** For the next couple of minutes I want you to continue this type of breathing we just practiced on your own. This time as you inhale say the word "healing" to yourself, and as you exhale say the word "relax" to yourself. **[pause 2 minutes]**

Good, continue that process of breathing, and with each exhalation feel your muscles become more relaxed as any tension is being released. Scan your body for any tension or discomfort. As you exhale, picture any tension, pain, conflict escaping through your mouth. Allow your muscles to become warm and relaxed.

Focus your attention now on your **[say injured part]**, notice how it feels while you continue to breathe slowly repeating the words "healing" on the inhale and "relax" on the exhale. Imagine the **[specific injury of ligaments or muscles, etc.]** that comprise(s) your **[say injured part]**. Focus on this area in particular and become aware of how it feels right now. You may or may not experience tingling around the area or some discomfort, and that is OK. It is natural to feel sensations while doing imagery. Imagine oxygen and blood flowing to the injury area, taking away any damaged cells or tissue. Take this image and refocus on your breathing. As you inhale deeply, oxygen and blood are surrounding your **[say injured part]**, and as you exhale any damaged cells or tissues are being removed. Continue this process on your own for the next couple of minutes, enabling your body's ability to heal itself. **[pause 5 minutes]**

Good, focus again on your breathing. Inhaling for a count of four, holding for a count of 2 and then exhaling for a count of four. This time, I would like for you to say the word "revitalize" as you inhale and the word "calm" as you exhale to yourself. Refocus your attention back to your whole body and the way it feels right now. You are taking an active part in your recovery and will heal a little more each time you use imagery. **[pause 10 sec.]** I am going to count back from the number five, and with each step closer to the number one, I want you to become more aware of your surroundings and the noises around you. 5 **[4 sec.]**, 4 become more alert, 3 wiggle your fingers and toes, 2 when you are ready you can open your eyes, 1.