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THE ROLE OF IMAGERY IN AN ALPINE SKI RACER'S REHABILITATION: REDUCING PRE-PERFORMANCE ANXIETY AND MAINTAINING PRE-INJURY PERFORMANCE LEVELS

By

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ABSTRACT

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Returning to sport after injury and prolonged rehabilitation can produce increased anxiety, which can have a negative effect on performance. Imagery is often advocated as an effective skill for reducing anxiety and enhancing performance. The purpose of this case study was to investigate the relationship of positive performance imagery used during rehabilitation to reduce perceived anxiety upon returning to skiing, and to assess the skier's ability to regain perceived level of performance prior to the injury compared to a previous injury. The subject was a female, 14-year-old ski racer who suffered a hip dislocation. Four years earlier, at age ten she experienced a tibia fracture. The injured skier consented to an imagery intervention three weeks before she returned to skiing after her hip dislocation and an interview after her first post-injury skiing experience. Her two injury experiences were compared and inductively analyzed qualitatively. The injured skier did perceive lower anxiety and higher performance levels when she returned to skiing after her hip dislocation as compared to her tibia fracture. The results of this study support the use of performance imagery during rehabilitation to enhance recovery from injury.

For Eddie

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INTRODUCTION

Now, more than ever, athletes must start training earlier, harder, and take more risks to be competitive. With more risk comes an increase in athletic injuries. An athlete's progress made through training and conditioning is suddenly taken away when an injury occurs (Faris, 1985), and there is an emotional trauma that accompanies injury that may interfere with the athlete's future performance (Feltz, 1986). During the rehabilitation process, athletes may allow their minds to "run wild," which increases their anxiety, as they concentrate on fears of reinjury, pain with the injury, and not being able to return to their previous level of ability (Green, 1992; Rotella, 1988).

The lack of attention to psychological factors in athletic injuries has lead to the belief that if the body is ready (healed), the mind is also ready (Gordon, 1986). All too often, the belief is unfounded; in many cases we see an athlete return to competition after injury and never regain her or his prior level of performance. For example, when an alpine skier suffers a lower extremity injury (fractured lower extremity bone or knee injury requiring surgery), she or he may not be able to ski for at least four weeks. The inability to ski or practice in a race course allows the skier too much time to reenact the injury in her or his mind. This reenactment, along with time off snow (not being able to practice), reduces the skier's self-confidence. When the physical injury is healed and the racer is able to return to skiing, she or he often feels anxious about her or his level of

performance, reinjury, and may question her or his ability to perform. The anxiety the skier feels can have a debilitating effect on her or his performance. To reduce the skier's anxiety, it is important to explore structured interventions during injury rehabilitation so performance levels are optimized when the skier returns to ski racing. Ski racers are already familiar with the psychological skill called performance imagery. Performance imagery is used to memorize the placement of gates in a race course, when to "set-up" for different turns, and when to straighten a line for increased speed. This is why performance imagery was chosen as the intervention for this study.

Imagery is a psychological skill that allows an individual to gain better control over an experience. Imagery is dimensional in all sensations - tactile, auditory, emotional, and muscular (Suinn, 1983). Imagery has been found to be related to a faster recovery time when not counteracted by extensive injury-reinjury replay imagery (Ievleva & Orlick, 1991). In an experiment by Budney and Woolfolk (1990), failure imagery was found to be stronger in lowering performance than successful imagery was in increasing performance. Gordon (1986) found that successful imagery could be taught to control an athlete's imagination ("worst possible" scenarios) and reduce anxiety. Paivio (1985) explains: "We might even experience positive or negative emotions along with the imagined successes or failures" (p. 23). Paivio's (1985) Analytic Framework of Imagery Effects provided the theoretical base for this research project due to its belief that the functions of imagery can be imagined independently or in combination with one another. In terms of this research project, the injured skier

will be instructed to always visualize themselves skiing without falling (goal orientated imagery) and along with the imagined success they should experience positive emotions. Also, if the injured skier happens to see themselves falling they will be instructed to stop their thought, back up in their mind to the point when they were skiing well, and use either the strategy or skill function of imagery to be successful, and as a result the injured skier should feel good about skiing and their performance.

Need for Study

A survey of athletes and coaches of the United States Alpine Ski Team indicated that psychological recovery from injury is ranked third by athletes and fourth by coaches as the most important mental skill, according to a study by Keller (1995). Specific psychological skill(s) needed to overcome the psychological effects of injury were not identified. Imagery, interestingly, was ranked first by athletes and third by coaches as the most important mental skill. Rotella (1988) states that imagery can be useful in preparing athletes to deal with anxiety associated with returning to competition. However, there has not been any research, to my knowledge, that examines the benefits of positive performance imagery, used during rehabilitation, which determines whether or not imagery 1) reduces an injured athlete's pre-performance anxiety upon return to her or his sport, and 2) enables the athlete to regain previous levels of performance prior to injury. It is important for an athlete to perform as well as they did before injury in order to maintain their level of confidence. Because high anxiety is associated with low performance (Martens, Vealey, & Burton, 1990),

and imagery has been found to help reduce anxiety (Gordon, 1986), the benefits of positive performance imagery in the reduction of anxiety associated with returning to competition needs to be explored. Jones (1995) supports this position by stating: ". . . it may be more productive to adopt some preventative strategy [positive performance imagery] which would preclude the onset of symptoms [anxiety] in the first place" (p. 456).

Purpose of Study

The purpose of this study was to examine the effects of positive performance imagery used during rehabilitation on 1) an athlete's perceived anxiety when returning to skiing, and 2) the athlete's perceived level of performance.

The independent variable is imagery usage and the dependent variables are: 1) perception of anxiety when returning to skiing, and 2) perception of performance.

Delimitations and Limitations

Alpine ski racers with lower extremity injuries (fracture or knee and ankle injuries that required surgery) were chosen as the sample group, because skiers with this type of injury are unable to practice any part of their sport until almost fully recovered. Lower extremity fractures and knee or ankle injuries that require surgery were chosen because these types of injuries require more than four weeks to heal. Early in their careers, alpine ski racers are taught to use imagery as a way of memorizing a race course. Therefore, the use of positive performance imagery during rehabilitation should be a familiar sport psychology

tool. Positive performance imagery was selected because a relationship has been found between imagery use and anxiety (Vadocz, Hall, & Moritz, 1997). Thirteen to twenty-one year-old skiers were selected due to their general imagery ability, according to the Alpine Athlete Competencies Statement by the United States Ski and Snowboard Association (1997). The sample was limited to injured ski racers. The study was limited by not being able to start in December, the beginning of ski season, due to a two month review delay by the University's UCRIHS committee. The study was also limited due to the lack of injured skiers who met the proposed research project's criteria. A consultation with an injured ski racer, given during the proposed research project's timeframe led to this revised study of one skier. Because the consultation was post-injury and limited in time, pre-injury surveys were not administered.

Hypothesis

It was hypothesized that positive performance imagery used during rehabilitation will: 1) reduce an injured skier's perception of anxiety when returning to skiing, and 2) enable the skier to regain the perceived level of performance prior to injury, compared to a previous injury experience.

Chapter 2

LITERATURE REVIEW

Many studies have examined the psychological effects of injury to an athlete and how these influence her or his recovery from injury. Many books and articles discuss athletes' levels of anxiety when they return to competition after an injury. However, there has not been any empirical evidence, to date, to support these statements concerning the level of anxiety an athlete feels when she or he returns to competition. High levels of anxiety have been empirically proven to negatively affect performance (Bird & Horn, 1990; Burton, 1988; Gould, Petlichkoff, Simons, & Vevera, 1987; Martens et al. 1990; Sonstroem & Bernardo, 1982).

Injury – Anxiety Relationship

The psychological effects of physical injury on elite level athletes were studied by Leddy, Lambert, and Ogles (1994). The subjects were male collegiate athletes from ten different teams who were divided into two separate groups: injured and uninjured. The Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI) and Tennessee Self-Concept Scale (TSCS) were administered to all athletes and readministered to injured athletes within one week of their injury, as well as to randomly selected non-injured athletes. The findings showed that injured athletes had higher levels of depression and anxiety and lower self-esteem than the athletes who were not injured.

Smith, Scott, O'Fallon, and Young (1990) examined the emotional responses of athletes to injury with the Profile of Mood States (POMS) and Emotional Responses of Athletes to Injury Questionnaire (ERAIQ). The subjects participated in different sports and the severity of injury ranged from minor (one doctor examination) to major (three to eleven doctor examinations). Their findings showed athletes with major injuries had the greatest mood disturbance when compared to athletes with minor to moderate injuries. Athletes with major injuries were found to have high ratings of tension, depression, and anger, with depression rated the highest.

Crossman, Jamieson, and Hume (1990) assessed athletes, coaches and medical professionals utilizing a questionnaire concerning the seriousness and short term effects of athletic injury. The findings showed the lower-level athletes overestimated the seriousness of their injury with reports of more pain, anxiety, anger, loneliness and feelings of inadequacy. Higher-level athletes did not overestimate the seriousness of their injury as often. The authors speculated that these differences between a lower- and higher-level athlete were due to the higher-level athletes' previous experience with injuries.

Feltz (1986) explains in her chapter the psychology of sport injury that although an injured athlete recovers physically, she or he may not have recovered emotionally in order to be an effective competitor. Feltz also states that the athlete may experience anxiety about returning to competition, lack confidence in her or his ability, and suffer from irrational thinking which leads to fear of reinjury or an inability to concentrate on performance.

Imagery as a Suggested Intervention

Two chapters by Rotella (Rotella & Heyman, 1986; and Rotella, 1988) describe feelings of anxiety and tension that athletes experience when they return to competition. This anxiety and tension may lead to reinjury, or lowered confidence which may result in temporary to permanent performance decrement, general depression, and fear of reinjury. Injured athletes' imaginations were believed to influence their response to injury. Athletes often imagine the worst that could happen to them. When this happens, it is believed that imagery can be taught to control these images, reduce anxiety and aid in rehabilitation.

Lynch (1988) explains in a commentary that athletes experience anxiety, depression, anger, fear, tension, disgust, and panic when a sudden injury happens. The interventions suggested to alleviate these feelings include using imagery, modeling others who experienced the same injury and who are now fully recovered, and social support.

Imagery Usage

An article by Denis (1985) explains that if the properties of imagery (visual, auditory, and kinesthetic) are to be effective they require "vividness," "controllability," and "exactness of reference." Denis explains that vividness is related to skill level. Elite athletes can image better due to their mastery of a skill as compared to athletes who are just learning a skill. Controllability is the ability to create repeated images. Without controllability, learning would be hindered because accurate repetitions would not be possible. Exactness of reference refers to "what you see is what you get." If an athlete images a wrong image

(reinjury or falling) repeatedly, it leads to a tendency to perform according to the (wrong) image.

A study of alternating actual practice with imagery practice by Kohl, Ellis, and Roenker (1997) involved two different experiment groups. In experiment one, one hundred right-handed female and male undergraduate students were divided into five groups: actual practice, imagery practice, alternating actual and imagery practice, alternating actual practice and rest, and control. All subjects observed and listened to the experimenter while he demonstrated the use of a standard photoelectric pursuit rotor using the left hand. The subjects were tested using their left hand after intervals of actual practice, imagery practice, rest, or silent reading, depending on the group to which the subject was assigned. The results indicated that the alternating actual and imagery practice group and the actual practice group had equivalent and higher scores than other groups. The researchers noted that the results were consistent with other studies, and cited a study that found alternating actual practice and imagery practice produced superior retention of a skill to that of actual practice. Experiment two tested one hundred right-handed undergraduate students using the identical apparatus and procedure as experiment one, except subjects were tested using their right hand. The results were similar to experiment one i.e., the actual practice group and the alternating imagery with actual practice group had equivalent and higher scores than the other groups. The researchers contend their results support the idea that alternating actual and imagery practice facilitates motor learning.

Kendall, Hrycaiko, Martin, and Kendall (1990) examined the effectiveness of a mental training package on the performance of a specific defensive basketball skill during competition. The mental training package included imagery rehearsal, relaxation and self-talk. The subjects were four female intercollegiate varsity basketball players. The mental training package was taught to each subject and their games were videotaped and analyzed using an instrument developed by the researcher to assess a predetermined basketball skill. In addition, each subject completed a logbook concerning their feelings, the Vividness of Visual Imagery Questionnaire, a modified version of Gordon's Test of Visual Imagery Control, an effectiveness of the mental preparations strategy evaluation questionnaire, and a social validation questionnaire. The results indicated that the mental training package was effective in enhancing performance of a specific defensive skill in basketball.

The effects of negative imagery on motor performance were studied by Budney and Woolfolk (1990) with four different experiments. The first experiment involved thirty subjects and investigated the effects of pre-performance imagery on putting a golf ball. The subjects were randomly assigned to three groups: positive imagery, negative imagery, or control. The findings suggested that pre-performance imagery could either enhance or lower performance. It was concluded that it was the outcome component of imagery, and not the rehearsal imagery, that influenced performance. The second experiment examined the role of self-efficacy in the mechanisms of action by which imagery affects putting golf balls. Fifty subjects were randomly assigned to six groups: successful

outcome with motor performance, failure outcome with motor performance, motor performance only, successful outcome only, and failure outcome only. A self-efficacy test and an imagery questionnaire that measured clarity, vividness and control was administered as a pre- and post-test. It was found that failure imagery was stronger in lowering performance than successful imagery was in enhancing performance. It was also suggested that successful imagery may have a distracting and negative effect on performance. This phenomenon was explained by noting that there may be an increase in attention to motor processes which may cause decreases in performance for some individuals.

The third experiment looked at the effects of pre-performance emotional imagery on a gross motor strength task. Thirty subjects performed under five different circumstances: pretest, anger, fear, relaxation, and post-test. The Magnitude Estimation Scaling (MES) procedure was used to evaluate the emotionality and quality of the imagery experience. It was found that perceived emotional responses to imagery affected performance differently for each individual. It was also suggested that clear visualization or control of an image is not necessary for imagery to influence motor performance due to subjects mistaken presumptions of which emotional imagery affected performance the best. The fourth experiment examined how individual differences in emotional responses to imagery influenced the direction of the imagery's affect on strength. Twenty-five subjects performed seven trials under three conditions: three baseline trials, two relaxation trials, and two anger trials. The subjects completed the Anger Expression (AX) Scale and the Trait Anger Scale, and

diastolic blood pressure was taken to show a physiological correlate of induced anger. The findings showed that relaxation imagery decreased mean strength performance from baseline trials and that the anger condition did not differ from mean baseline performance. The authors concluded that performance imagery can either enhance or lower performance depending on the individual, and therefore, caution should be taken to match the individual with the appropriate image.

Theoretical Basis for Research

According to Paivio's (1985) Analytic Framework of Imagery Effects, imagery has two purposes, motivational and cognitive, with each operating at two levels, general or specific. This framework is made up of: a motivational general affect (MG-affect), motivational general arousal (MG-arousal), motivational specific goal-oriented responses (MS-goals), cognitive general strategies (CG-strategies), and cognitive specific skills (CS-skills) (see Table 1).

Table 1

Paivio's Analytic Framework of Imagery Effects (1985)

	Motivation	Cognition
General	Arousal and Affect	Strategies
Specific	Goal-oriented Responses	Skills

The MG-affect and MG-arousal refer to the physiological (affect) and emotional (arousal) aspects that may be experienced when imaging successes

or failures. MS-goals refer to outcome imagery, such as the imagery of not falling and always finishing a race course (or skiing to the bottom of the ski hill), winning a race, and being congratulated by coaches. The CG-strategies component involves how to prepare for a specific situation. An example of a ski racing strategy is imaging how to react if a skier loses a ski pole in the start gate and needs to continue through the race course with only one ski pole while maintaining balance, turning from gate to gate, and poling through the finish gate. CS-skill refers to imaging a skill to strengthen correct technique or eliminate incorrect technique. These functions of imagery can be imagined independently or in combination with one another. Paivio explains: "We might even experience positive or negative emotions along with the imagined successes or failures" (p.23). Each of the four functions of imagery represents differences in imagery content.

Imagery – Anxiety Relationship

A relationship between imagery as a psychological tool and the reduction of anxiety has been found in previous studies. Hall, Mack, and Paivio (1996) developed the Sports Imagery Questionnaire (SIQ) to assess the motivation and cognitive functions of imagery. Four experiments were undertaken to validate the SIQ and the results confirmed the motivational and cognitive functions of imagery proposed by Paivio (1985). The SIQ delineated two distinct subscales for the MG factor, MG-mastery and MG-arousal. MG-mastery refers to being in control and maintaining focus. Imagery content for MG-arousal refers to the emotions felt while competing. The findings also offered indirect support for

research that discovered a relationship between imagery use and state anxiety (Vadocz et al., 1997).

A study by Vadocz et al. explores the relationship between imagery use, imagery ability, anxiety, and performance. Prior to a Junior North American Roller Skating Championship, fifty-seven male and female competitive roller skaters completed: the Competitive State Anxiety Inventory-2 (CSAI-2), Sports Imagery Questionnaire (SIQ), and the Movement Imagery Questionnaire (MIQ). The results found that athletes who placed in the top three positions reported lower levels of cognitive and somatic A-state and higher self-confidence. The MG-arousal component of imagery was related to increased anxiety. Self-confidence and kinesthetic imagery ability predicted whether or not the athlete would place in the top three positions. Skaters who reported lower cognitive anxiety had higher imagery ability. The use of motivational imagery does not influence performance directly, but affects cognitive state anxiety and self-confidence.

Madigan, Frey, and Matlock (1992) studied the details of cognitive rehearsal techniques that enhance performance of athletes, in order to gain descriptive information about these techniques. Eighteen women and eighteen men from both ski and basketball teams were interviewed concerning their cognitive rehearsal. During the interview, athletes were asked to rehearse a specific skill or strategy and then answered questions to characterize the visual, auditory, kinesthetic, haptic, gustatory, and olfactory sensations. The conclusions found that skiers and basketball players used both external and

internal imagery, with no differences in their use. Satisfaction and confidence were found to be strong affective states associated with cognitive rehearsal, and cognitive rehearsal was used more for developing motor skills than cognitive performance strategies. The last finding was noted to be different from the conclusions drawn by Feltz and Landers (1983), in which mental practice produced stronger effects in tasks that were primarily cognitive than in tasks that were primarily motor skills.

Kerr and Leith (1993) investigated the effects of stress inoculation training (SIT) on eight female and sixteen male Canadian gymnasts. SIT is a stress-management program that teaches coping skills to enhance performance. The program includes developing productive thoughts, mental imagery, and self-statements. In addition to participating in the SIT program, the subjects' performance ratings were obtained from three competitions, and three questionnaires were completed at the beginning and at the end of the study. The three questionnaires were the Test Anxiety Scale, Sport Imagery Assessment Questionnaire and Sport Competition Anxiety Test (SCAT). Subjects were divided into two groups, experimental and control. The results found that the SIT had no effect on reported competitive anxiety levels. The experimental group improved in performance, mental rehearsal, and attentional focus and had higher levels of anxiety than the control group. The researchers proposed that further research is needed to investigate the effects of each individual component of the SIT.

In a published interview, Orlick and Lee-Gartner (1993) asked a Canadian Olympic female downhill ski racer (Lee-Gartner) about her two injuries and what she did during her rehabilitation to help herself recover "mentally." She stated: ". . . the mental recovery was the hardest part," and "skiing" in her mind every day helped her keep focused, made it easier to get out on downhill skis, and make speed adjustment faster. When asked how her first run went after the recovery, she responded that with her second injury: "I had already succeeded in being able to imagine myself skiing perfectly and I did it throughout the six months of recuperation. When I put my skis on it was like I wasn't even off of them." This interview is the only citation found that supports the usefulness of imagery in enhancing rehabilitation and performance upon returning to competition.

Summary

Injured athletes experience increased anxiety before returning to their sport (Crossman et al., 1990; Feltz, 1986; Leddy et al., 1994; Rotella & Heyman, 1986; Rotella, 1988). Increased anxiety has been found to lower performance (Bird & Horn, 1990; Burton, 1988; Gould et al., 1987; Martens et al.; Sonstroem & Bernardo, 1982). A relationship has been found between anxiety and imagery (Vadocz et al.), in which successful athletes had higher imagery ability and reported lower levels of cognitive anxiety. Imagery has also been found to facilitate learning a skill (Kohl et al., 1997; Kendall et al., 1990). It is believed that injured athletes sometimes image the worst that can happen (Rotella & Heyman, 1986; Rotella, 1988) and it was found that failure imagery was stronger in

lowering performance than successful imagery was in improving performance (Budney & Woolfolk, 1990). According to Denis (1985) "what you see is what you get", so that if an injured skier consistently images her or himself falling, when they return to skiing that is what they will do – fall. Paivio (1985) explains that the functions of imagery outlined in his analytic framework can be imaged independently or in combination with one another. For example, imagining goal-orientated successes can be accompanied by positive emotions at the same time. Budney and Woolfolk, (1990) found the outcome component of imagery [goal-orientation], and not the rehearsal imagery [strategy or skill], influenced performance. Hall, Mack, and Paivio (1996) stated their findings, from SIQ testing support the motivational and cognitive functions of imagery proposed by Paivio (1985). Suggested interventions for injured athletes included imagery (Lynch, 1988; Kerr & Leith, 1993) because of its ability to control failure imagery and substitute it with positive imagery, which would reduce anxiety (Rotella & Heyman, 1986; Rotella, 1988).

Chapter 3

METHOD

Participant

The subject was a 14 year-old female alpine ski racer with 12 years of skiing, and 5 years of ski racing, experience. She was ranked third overall when compared to other Far West USSA female competitors in her age group (13 to 14 year-olds) before her injury. While she was skiing next to a race course and practicing turns to prepare for a race, she fell and dislocated her hip within one hour before the race. She was 10 years old and ranked 14th overall when she experienced a proximal tibia fracture while skiing next to a race course and getting ready for a race. The circumstances for both injuries are the same: skiing next to a race course to prepare for a race within one hour before the race. It took two months, from date of injury to her next skiing experience, to recover from her hip dislocation. The tibia fracture took 11 months to rehabilitate from date of injury until she skied again.

Hip dislocation is an unusual ski injury; her doctor explained that this type of injury is seen in major car crashes where speed is a factor. The subject takes pride in her injury because it means she was going "...pretty fast. Like, yea." The injury required a closed reduction procedure and a three-day hospital stay. It took two months from date of injury to her next skiing experience. There were

14 rehabilitation sessions with a therapist in a clinic after her hip dislocation and she did not miss one session.

The subject was highly motivated to return to ski racing as soon as she could, stating "if I can just workout, I was working out twice as hard as anybody else (in that clinic), because I wanted to come back so bad." When asked what would happen if she missed a physical therapy session, she stated: "I'd miss out on all the stuff I needed to do and I'd be behind for the next time I came in, the goals I needed to reach for each time I came in wouldn't be met. So I'd have to work extra hard when I came in." Her only goal was to walk normally again. She described her hip dislocation injury as "my muscles were just hanging, they were stretched so much that they just kind of gave up. And my leg was longer than my other one, nobody believed me but finally they measured it and it was longer. And that was because the muscles weren't fully tightened." The injured skier explained the healing process, stating, "I can see my muscles tightening back into place and growing stronger." She would also motivate herself by thinking, "of being back on skis and the sooner I healed, the sooner that time would come." She also worked out in a gym on her own during the two-month rehabilitation period. The injured skier has no late effects from her hip dislocation.

The treatment for her tibia fracture, at age ten, included a closed reduction procedure and physical therapy. In remembering this rehabilitation experience, she states: "Well, I had to go to therapy a lot and that was really painful and then it was really hard getting around places, I was slower than everybody else. And I

just, it was hard because I couldn't do the things I used to do and I still can't do things that I used to be able to do." The late effects from her tibia fracture are "My knee still bothers me when I play soccer. I used to have to wear a brace full time, now it's only off and on and it can't bend as far as it used to."

The injured skier is a very active 14-year-old. In addition to skiing, she is also a very active participant in soccer, mountain biking, working out (lifting weights and running) in the gym, and roller blading. During the summer, a typical day involves riding her mountain bike four to five miles to the gym, working out for one hour and a half, riding her mountain bike back home, roller blading, mountain biking again, and then playing soccer. She reported she does this about five days per week.

Materials

The materials used in this study were: Development of skill: Visualization video (National Sport & Recreation Center & Biesterfeld, 1987), television monitor, video cassette recorder (VCR), imagery script, preliminary interview questions answered by the athlete (Appendix A), Personal Data questionnaire (Appendix B), cassette tape, and cassette tape recorder.

Design and Procedure

Principals of two area high school ski teams were contacted by telephone. Neither of the two principals contacted would release the ski team members' names and addresses. One of the principals allowed the letters of introduction (Appendix C) and informed consent forms (Appendix D) to be given to him for

distribution to parents of his ski team members. No signed informed consents were received from the high school ski team members' parents.

Six hundred parents of Far West USSA members, age13 to17, were contacted by mail with an introduction and explanation of the research project (Appendix E). Included in the parents' mailing was an informed consent form to permit their child to participate in the study, along with a questionnaire to identify their coach and provide the coach's phone number (Appendix F).

Forty-three adult Far West USSA members, aged 18 to 21, were contacted by mail with an introduction and explanation of the research project (Appendix G). Included in the adults' mailing was an informed consent form to indicate their willingness to participate in the study, along with a questionnaire to identify their coach and provide the coach's phone number (Appendix H).

Coaches of local ski teams were contacted in person or by telephone in order to recruit more subjects for the study. All coaches contacted cooperated by distributing the parents' letters of introduction (Appendix E) and informed consent forms (Appendix F) to their ski team members.

Two months after the proposed study began, a signed informed consent form was received from a ski racer who was injured before the study started. Considering that none of the subjects who took the pre-injury surveys were injured at that point in time, a consultation was given to rehearse the first hour of positive performance imagery intervention. Also, if the intervention helps reduce pre-performance anxiety, as hypothesized, then a consultation should not be denied.

A meeting was arranged with the injured skier in her home after school. The skier and I met in her living room alone where a television monitor and VCR were located. Her father was in another room of the house and did not disturb us during the meeting. The imagery session lasted approximately one hour. An introduction was given concerning the purpose of the meeting describing the activities that would be included in the session. The session included viewing a video about imagery, discussing the video, the use of three imagery exercises, and the subject imaging herself skiing.

The video, Development of skills: Visualization (National Sport & Recreation Center & Biesterfeld, 1987) was presented first. During viewing of the video my comments were kept to a minimum so her attention would not be detracted from the video. After the video, a discussion was lead by me outlining relevant issues the video highlighted. Those issues included the different senses of imagery (auditory, visual, and feeling), getting the most effective results from imagery, such as when you can actually feel your muscles move, positive self talk, believing in imagery, practicing imagery ten to fifteen minutes per day, using imagery before practicing a skill, and imagery as a substitute, if actual practice is not possible. Thought stoppage was also discussed, as essential to the ability to control imagery. Then, the injured skier was led through three imagery exercises. The first two exercises, vividness exercises one and two, were read from Weinberg (1988, pp. 109-111) verbatim, and the third exercise was adapted to skiing using Weinberg's vividness exercise five as a model (Appendix I). After each exercise the subject was asked if the exercise was easy or difficult to see,

control, and/or feel. If the exercise was difficult, she was asked to explain the difficulty. After the difficulty was explained, the exercise would be repeated and explained differently until she understood the exercise and was able to perform it with ease.

Because she was injured while skiing, and not while in a race course, she was led through a second positive skiing imagery sequence. The imagery sequence started with driving to the ski area, getting her ski boots on, walking from the lodge to put her skis on, clicking into her bindings, getting in the chair lift line, getting on the chair, going up the chair lift, skiing off the chair, standing at the top of the hill with her skis on, looking around, pushing off with her ski poles, skiing down the hill and feeling the muscles in her legs with knees bent, pressing, feeling the weight exchange in her legs and hips, feeling her arms move to plant her ski poles as she goes from one turn to another, and feeling her muscles work as she comes to a stop at the bottom of the hill. When this exercise was finished, she had a smile on her face and answered that she could feel her muscles "skiing" even though she was seated in a chair in her living room.

Thought stoppage was discussed again, pointing out that if she images herself falling or making a mistake, she can stop the thought, back up and image herself skiing successfully in her mind. She then imaged herself falling, stopping the thought, backing up and going on to skiing successfully. After doing this, she said that it was successful. She was able to stop her thought when she imagined herself falling, go back and see herself skiing successfully.

She was planning to ski again in three weeks from our meeting, therefore, we discussed using imagery at least once a day: seeing and feeling herself skiing successfully every time. If she imaged herself falling or making a mistake, she was instructed to stop the thought and back up to see and feel herself skiing successfully, controlling her image.

Four months after her first skiing experience, I contacted the injured skier by telephone to inquire if I could interview her using a cassette recorder concerning her injury, rehabilitation, imagery meeting, imagery usage, and first skiing experience. To prepare for our interview, I mailed her the logbook questions (Appendix A) and personal data questionnaire (Appendix B) with a stamped addressed return envelope for her to complete after our phone conversation. The logbook questions were informational and used to construct in-depth interview questions. The injured skier and I met again in her home for the cassette taped interview. Both of her parents were home but did not disturb us during the interview. The interview lasted for one hour and 15 minutes. The interview was unstructured (Patton, 1990) and included questions concerning both of her injuries, rehabilitation, imagery usage, anxiety, and the imagery intervention (Appendix J). The questions were formulated as suggested by Patton (1990) to avoid too many dichotomous questions which are informational, but do not allow the person interviewed to express her opinion in her own words, which may bring up a valuable line of questioning that the researcher did not anticipate before the interview. Open-ended questions, such as: "What is your opinion of our imagery session?" and "What is your opinion of those (imagery)

skills?" were often followed by probes to clarify answers and gather additional detail. Examples of probes for the previous questions would be, "How did it (imagery session) help?" and "Because?" When dichotomous questions were necessary, they were often followed by an open ended question, for example, "Do you find it easier to be lead through the imagery or to do it on your own?" followed by, "Why is that?" Credibility and reliability of the answers were often verified during the interview by repeating the injured skiers answers before going on to the next question and asking the same question two or three different times during the interview.

The injured skier was contacted by phone two months after our interview to clarify some of her interview answers. She also answered questions in areas that were found lacking after review of the initial interview (Appendix K). This interview lasted 20 minutes.

Both interviews were transcribed from the cassette tapes verbatim. Patton's (1990) chapter on Qualitative Analysis and Interpretation was used as a guideline on how to organize and inductively analyze the data from the case study. Three copies of the transcripts were made. One copy was stored for safe keeping. On the other two copies, all of the questions, including their answers, were identically numbered sequentially to maintain continuity. Maintaining the continuity of the questions was felt to be important in keeping the meaning of the question in proper context. One copy of the transcript, the questions were cut and separated and each numbered question and its answer were taped to an index card.

The second numbered copy of the transcript was reviewed for content analysis. Six areas of classification emerged from the transcript. The six areas of classification were: general (G), anxiety (A), rehabilitation (R), injury (In), imagery (Im), and imagery session recall (Is). Each of these index cards were evaluated and coded utilizing the classification system and then organized according to their classification code. Upon review of the index cards within their classification, seven themes emerged. The seven themes are: 1) the injured skier used performance imagery before her present injury, 2) the injured skier was more developmentally capable in imagery use before her present injury, 3) the injured skier had thoughts of reinjury after both injuries, 4) the effects of the imagery intervention on the injured skier's imagery usage are related to her ability to control images positively, 5) the injured skier now uses imagery with structure and regularity since the imagery intervention, 6) using positive performance imagery during her hip dislocation rehabilitation reduced the injured skiers perceived anxiety when she returned to skiing, 7) positive performance imagery during her hip dislocation rehabilitation enabled the injured skier to regain perceived level of performance prior to injury. The data from the case study are presented in the Results section according to the seven themes.

Chapter 4

RESULTS

It is hypothesized that positive performance imagery used during rehabilitation will: 1) reduce an injured skier's perception of anxiety when returning to skiing, and 2) enable the skier to regain the perceived level of performance prior to injury, compared to a previous injury experience. Seven themes emerged based on the injured skier's answers to the logbook and interview questions. Themes one through five support and are important in understanding the injured skier's imagery ability and use before and after the positive performance intervention. Theme six supports hypothesis one, and theme seven supports hypothesis two.

The seven themes are: one: the injured skier used performance imagery before her present injury; two: the injured skier was more developmentally capable in imagery use before her present injury; three: the injured skier had thoughts of reinjury after both injuries; four: the effects of the imagery intervention on the injured skier's imagery usage are related to her ability to control images positively; five: the injured skier now uses imagery with structure and regularity since the imagery intervention; six: using positive performance imagery during her hip dislocation rehabilitation reduced the injured skiers perceived anxiety when she returned to skiing; and seven: positive performance imagery during her

hip dislocation rehabilitation enabled the injured skier to regain perceived level of performance prior to injury.

Theme one: the injured skier used performance imagery before her present injury. She did not identify her skill as imagery when questioned initially "I had never practiced sport psychological skills before I raced." When I asked her to clarify what she meant by this statement, and if she used imagery, she answered: "Well I never did before I met you; I like psych myself up, you know, I'd go through the course..." I interjected at this point, "You would go through the course in your own mind?" She answered: "Yeah." To this I replied, "Well that's imagery, you were using imagery." She used imagery as part of her earlier training, stating, "Uh huh, that's a big part before we go out training, is imagery. Like our coaches make our training just like a race. We go through the course and we memorize the course before we start training it. Then we go up and we discuss what we need to do in the course. We take time to think about what we need to do in the course. We take time to think about what we need to do and we have to imagine ourself doing the correct positions to take in the course."

Theme two: the injured skier was more developmentally capable in imagery use before her present injury. When I asked her what her images were like, she explained: "I can see myself in me and I can see myself from behind. When I use imagery I can like feel the way my muscles should feel when I go through the course and I can also see what's its suppose to look like and that helps a lot when I get out, [and] also see what's it suppose to look like." When I probed further, she said that she could see the colors of the gates (red and blue),

hear the wind, and hear her skis as they run through snow or ice. Her opinion of the imagery skills is, "They help a lot, because if I didn't use imagery there'd be things that wouldn't work." Probing, I asked her "Because?" She replied "It's a big part of racing to prepare." When I asked her if imagery helped her to relax, she replied, "Yeah, one time at a race I was very late and I went up to the course and I went up through the course really fast to see what it was and I came back up and I just realized that I didn't memorize the course at all and if it wasn't for my friend I wouldn't have known the course and I have the most trouble going through courses that I don't prepare myself for, I don't do it. So, we went through the course like six to seven times and she took me through it and I felt really confident before and I did very well that race." I asked her if she used imagery for soccer, she replied "Not really. Just skiing." She did not use imagery during her earlier tibia fracture rehabilitation.

Theme three: the injured skier had thoughts of reinjury after both injuries. Since her hip dislocation, she admitted thoughts of reinjury: "I have seen myself getting reinjured about five times since my crash." When I asked her to explain in more detail, and indicate when, where, and what she would image, she answered "Well in the hospital [she was in the hospital for three days after her hip injury] I thought about it a lot and dreamed about it. I have seen myself landing on my knee and pushing my hip out of place on the soccer field and the ski slope again." The topic of reinjury came up again later in our interview, and she explained her image further: "I just remember, I just think about how I was in the air and then I come down and everything went blank. The falling and then

going blank and then waking up and feeling so much pain and then my friend having to come over and help me get out of my skis and into the toboggan and calm me down." I asked her if she had thoughts of reinjury right before, or four to five weeks before, she was to ski again after her hip dislocation "No. I only thought about it right before I was going to ski. I haven't really thought about it." I asked the injured skier if our imagery session stimulated any thoughts of reinjury and she stated: "I thought about it, but then I really didn't think about reinjury, I was thinking about how not to think about it." To be specific, I asked her if she was trying to think positively and she answered, "Yeah, how to make myself not think of it if it ever came up." Probing further, I asked her if she was describing thought stoppage, as we discussed during our meeting, and she replied "Uh huh." The injured skier also remembered thoughts of reinjury after her tibia fracture, "right after and right before I went back skiing." When I asked her how often the thoughts of reinjury happened, she stated: "Not often, only when I didn't have other things to think about."

Theme four: the effects of the imagery intervention on the injured skier's imagery usage are related to her ability to control images positively. Her opinion of our imagery session is: "It helped a lot." Probing further, I asked her how it helped, and she answered, "Like, I can control what I think now, I don't just let my thoughts wander, I can stop what I'm thinking and change the way I think." Her opinion of my leading her through imaging herself skiing was: "It helped a lot cause my image of skiing was usually, like, I didn't imagine myself really skiing anymore but where I crashed. That was my only thought, where I was skiing and

usually." An ability that the injured skier now has that she did not have before our meeting is: "I know how to imagine good thoughts. I can change my thoughts to good things." Questioning her again on whether she used imagery during her rehabilitation she answered "Well, [I did use] the imagery of going through the course and seeing myself, but I didn't use the imagery of stopping my thoughts." After probing the subject further, she admitted that she would just image her fall.

Theme five: the injured skier now uses imagery with structure and regularity since the imagery intervention. After our first meeting the injured skier has used performance imagery regularly and with structure saying, "I think three times a day." She would use imagery, "When I was thinking about going to go skiing and how I might fall and how I might feel." This would occur, "Before I go to sleep usually." The injured skier finds it easier not to be lead through imagery, stating: "Cause I can control my thoughts better when I tell myself to do it and not somebody else telling me I should do it." I asked her what she would image, and her answer: "I image a lot of stuff. Sometimes I image cooking but it's usually skiing." Probing further, I asked her to explain what her skiing image is. Her reply: "Pretty much everything I can do when I'm free skiing and racing and tucking down open runs and going up chairs." I asked her again if she sees herself fall, and she replied: "No, not usually." She explains that when she images, "I can see though my eyes kind of," and "I can see the trees, and hear the snow," and "I can see the gates, the snow, and the people. I can see my

coaches," and "I can feel the ruts." "I can feel my muscles getting tired and if I'm holding a tuck really long how my muscles start to burn."

The injured skier was planning on attending a race camp in New Zealand with her ski foundation one week after our interview date. This would be her first opportunity to ski in a race course since her hip dislocation. Discussing this upcoming trip, I asked her if she planned on using imagery to prepare for the experience. She replied: "Uh huh." I asked when she will begin, and she answered "I do it now." Probing further, I asked how often she uses imagery and what she is imaging, and her answer was: "Every time I think about skiing I've been imaging how I'm going to do it, and that's probably twice a day," and "I'm imaging the way I ski, the techniques I use, the sounds, my coach telling me what I need to do as I'm doing it and fixing it as I go." She added: "I see myself at ski camp and I picture last year when I was racing and I picture that course and I see myself going really fast." I asked her if she likes using imagery, and her reply was: "Uh huh. It helps a lot." After probing as to why, and how, she answered: "I don't know; if I didn't use imagery, I'd not be able to go back. I wouldn't be able to go skiing and then actually do it cause I would actually have to think about it then. With imagery you think about it beforehand so when you're actually skiing, you know it, you're expecting it." She affirmed that imagery helps her relax and focus on the experience. I asked her if imagery made her feel better or worse, and her reply was: "Better." And as to how it made her feel better, she explained: "It makes me feel more confident when I do it."

Theme six: using positive performance imagery during her hip dislocation rehabilitation reduced the injured skiers perceived anxiety when she returned to skiing. The injured skier stated: "It [imagery] was very effective." When asked how the imagery was effective, she answered: "Like, if I didn't use imagery I'd probably be scared so bad that I wouldn't want to do it. And when I came back with my injury, I was so excited and I knew I could do it." Probing further, I asked why did she feel that she could ski. Her answer: "'Cause I practiced it so much in my head before I did it, I was ready to go back up. I just felt like I just skied yesterday or the day before." When asked if the imagery relaxed her for her first skiing experience after the hip dislocation, she answered: "Yes, because if I didn't use imagery, I would be thinking about oh my gosh, it's been so long since I skied I probably won't be able to do it, I probably can't. I'd ski the way I used to, but with imagery, I'd see myself skiing the way I used to and how I improved."

The next line of questioning explored how nervous the injured skier felt when she returned to skiing after her tibia fracture compared to her recent hip dislocation. She was asked to rate her nervousness on a scale of one to five; "one" meaning not very nervous, to "five" meaning very nervous on this scale. She stated: "At points, at sometime, I was very nervous to go back skiing" after the tibia fracture. She started getting nervous the day before she was to go skiing, rating the experience a "four" and stating: "I would think about it during the day before, off and on, and I would think 'oh my gosh.'" I asked her if she got any more nervous as she started driving toward the ski area because she knew she was going to start skiing, and she said: "Yeah." Putting on her ski boots was

given a rating of "four," and I asked did she get any more nervous once she put her skis on? "Yeah, I started shaking," and gave this moment a rating of "five." When she clicked into her bindings, and put on her skis, her nervousness started to go down, and she said: "It felt really good to click into my bindings," and "I was really excited I was going 'Yes.'" As she was going up the ski hill, her nervousness changed: "I got really anxious to go up the hill and do it because I hadn't done it in so long, and when I was in rehabilitation, I would miss skiing so much because there was nothing else to do, I would just sit at home," rating her first skiing experience moment a "four." This first post-injury skiing experience took place on the same ski run where she fractured her tibia: "The first time I skied after my tibia fracture my dad took me to the exact same spot as when I broke it." She said: "I thought I was never gonna go on [that ski run] again, but my dad said this is what you are gonna do and I went". The first time she went into a race course after her tibia fracture, it "was scary." She explained: "Usually when I'm in a race course, you know, you think about it but you're not as uptight as you are, but the first race course I went back into was a training course and usually I'm not that uptight about a training course, you just want to do your best and I was even more nervous in the training course than I was in an actual race." She rated her first experience after her tibia fracture in a race course as, "Definitely five," and added, "I was very nervous."

She rated her nervousness the day before skiing after her hip dislocation a "three." As she was driving to the ski area I asked her if she was nervous and she replied: "More excited." Putting on her ski boots, she reported, "Then I got

kinda nervous," and gave this experience a rating of "three." Clicking into her bindings, putting her skis on, she said: "That felt really good," and rated this moment a "one." She rated her first skiing experience after the hip dislocation a "two and a half." The first skiing experience after the hip dislocation was not at the same ski area where she was injured. Her sister had a ski race at a different ski area and the injured skier went there with her family. However, the injured skier did ski in similar terrain, "the training garden," where she was injured, stating: "It's the same thing." Comparisons of the injured skier's ratings of nervousness are presented in Table 2.

Table 2

Comparison ratings of nervousness

	Tibia Fracture	Hip Dislocation
Day before Skiing	4	3
Putting on Ski Boots	4	3
Putting on Skis	5	1
First Skiing Experience	4	2 1/2

Theme seven: positive performance imagery during her hip dislocation rehabilitation enabled the injured skier to regain the perceived level of performance prior to injury. When asked if there was any difference in how she felt about getting back on skis after her tibia fracture compared to the same moment after her hip dislocation, she answered: "When I went back skiing after my tibia I was thinking that it's been so long since I skied it's going to hurt really

bad if I fall. I don't know how to ski anymore, I'm gonna have to teach myself how to ski all over again. And this time I was confident that I knew how to ski and I could move the way I used to." I asked her if the confidence she felt about skiing the way she used to was due to her previous experience, and she answered: "Yeah, it helped because when I got back from my tibia injury I found out that I could do it, but like sometimes I didn't believe I could but once I actually did, I knew I could, so when I came back from my dislocation of the hip, I knew that I could do it no matter what."

The injured skier explained further how imagery helped her skiing performance: "With imagery, I can improve the way I was skiing. Like if something I needed to work on, I could see it in my mind, one of the things I needed to work on, it's just like skiing. And I would do that so much that I would feel like I was doing it and when I actually went skiing it felt the exact same way." I asked her what was not effective about imagery, and she answered: "All imagery is good; I don't think there is bad imagery unless you're thinking of bad things." When I asked her if the imagery helped this time (she did not use imagery during her earlier tibia rehabilitation), as well as her previous experience with an injury, she answered: "Yes." and "It was like I was skiing yesterday." Her opinion of her first skiing experience after the tibia fracture is "I didn't do that well, I was tentative, I was really cautious, going really slow." Explaining the differences between the two skiing experiences, she said: "I attribute it to imagery."

Chapter 5

DISCUSSION

When an athlete is rehabilitating from a physical injury that happened while performing her or his sport, there is an emotional "injury" that must also be addressed so it will not interfere with the athlete's future performance (Feltz, 1986). The emotional injury, which includes fear of reinjury and of not being able to return to their previous level of ability, can increase the injured athlete's anxiety when they return to their sport (Green, 1992; Rotella, 1988). The United States Alpine Ski Team athletes ranked psychological recovery from injury as the third most important mental skill (Keller, 1995). Imagery can be useful in preparing an athlete to deal with anxiety associated with returning to competition (Lynch, 1988; Rotella & Heyman, 1986; Rotella, 1988). However, the benefits of positive performance imagery in reducing (pre-performance) anxiety during rehabilitation have yet to be researched.

This research is based on the Analytic Framework of Imagery Effects developed by Paivio (1985). The theory contends that imagery has two purposes, motivational and cognitive, each operating at two levels, general or specific. There is a motivational general affect (MG-affect), motivational general arousal (MG-arousal), motivational specific goal-oriented responses (MS-goals), cognitive general strategies (CG-strategies), and cognitive specific skills (CS-skills). Paivio explains that the functions of imagery can be imagined

independently or in combination, and each of the functions represents differences in imagery content.

The positive performance imagery intervention was designed to always allow an injured skier to experience a positive outcome when thinking about skiing. The injured skier was instructed to practice positive performance imagery at least two times a day, on a daily basis. During these structured moments, the injured skier controlled her images and always saw herself skiing successfully (not falling or reinjury). According to Paivio (1985) positive outcome is a goal-orientated (MS-G) response. The injured skier may, however, see herself falling during unstructured moments. To attain the positive outcome (skiing successfully), the subject was instructed to stop her thoughts when she began to see herself falling, back up the image in her mind to a point when she was skiing well and continue to ski well to the bottom of the ski hill. At the point when the subject backs up her image, the type of imagery the subject uses to continue skiing well could be either strategically (CG-S) or skill (CS-S) orientated. If the fall was due to a strategical error, such as skiing through a race course too straight, she would change her strategy at that moment and image herself making rounder turns through the race course. A skill oriented correction would be related to a fall caused by incorrect skiing technique. An example would be if the fall the subject imagined was caused by having her weight on her uphill ski, and when the subject backs up her imagery she would feel her weight on the correct downhill ski. With the positive outcome the injured skier may also experience good feelings (MG-A) about skiing and her skiing ability.

Theme one: the injured skier used performance imagery before her present injury. Performance imagery was a familiar sport psychological skill for the injured skier, although she did not label memorizing courses and practicing skiing techniques in her mind as performance imagery. Performance imagery was a skill that she used during training and while preparing for a race. She did not use positive performance imagery during the rehabilitation period for her tibia fracture. She also did not use positive performance imagery during the rehabilitation period for her hip dislocation until the intervention session with the researcher.

Theme two: the injured skier was more developmentally capable in her imagery use before her present injury. The injured skier's imagery use and skiing ability was different at age 10, when she fractured her tibia, compared to now at age 14, when she dislocated her hip. According to the Alpine Athlete Competencies Statement (USSA, 1997) the age of the imager is partly related to imagery use and ability. When the injured skier fractured her tibia at age 10, an athlete age 10 and under, 1) "Exhibits understanding of visual and verbal instruction by correct performance of task," 2) "Understands what the different five senses are," and 3) "Can demonstrate and/or describe perceptions and feeling in an age-developmental appropriate manner." Compared to when the injured skier dislocated her hip at age 14, according to the Alpine Athlete Competencies Statement (USSA, 1997), an athlete age 13 to 14, 1) "Can draw and accurately describe terrain features of courses and trails after an inspection," 2) "Understands the two perspectives, internal and external imagery," 3)

"Effective development of the external perspective; gains needed information from descriptions of movements, both visual and verbal," 4) "Understands kinesthetic awareness and internal feelings and uses them in imagery practice," and 5) "Visualization is vivid and clear." The injured skier was not mature enough developmentally in her imagery use when she was recovering from her tibia fracture to benefit from the kinesthetic properties of imagery, and vivid and clear visualizations. When the injured skier dislocated her hip, she was mature enough developmentally to take advantage of the kinesthetic properties of imagery and vivid and clear visualizations. It is the kinesthetic properties of imagery, with the ability to have clear and vivid visualizations, that are considered important by Orlick (1990) to replicate a real situation. The injured skier's skiing ability at age 14 has improved "by a lot" since she was ten years old. Two studies by Corbin (as cited in Smith, 1987) revealed when athletes are learning a new skill, or are low in ability, imagery is not as beneficial compared to athletes who are experienced in the skill, or high in ability, and use imagery. The effects of imagery were enhanced if the subject had a degree of experience with the skill. Denis (1985) agrees by stating elite athletes can image better due to their mastery of a skill than athletes who are learning a skill. Denis states that skill level is related to vividness and that vividness is one of the three requirements for imagery to be effective, which ties in with Orlick (1990).

Theme three: the injured skier had thoughts of reinjury after both injuries. Thoughts of reinjury occurred after her tibia fracture and her hip dislocation. Feltz (1986), Rotella and Heyman (1986), Rotella (1988), and Lynch (1988)

concur that although an injured athlete heals physically, she or he may not have healed emotionally to be an effective competitor when they return to their sport. Green (1992) and Rotella (1988) explain that imagining the worst that can happen (thoughts of reinjury), if not controlled, can lead to fear of reinjury and increased anxiety which hinders the athlete's performance when they return to their sport after injury. According to Denis (1985) "what you see is what you get" is one of three requirement's needed for imagery to be effective. Denis explains that if an athlete images a wrong image (reinjury or falling) repeatedly, it leads to a tendency to perform according to that (wrong) image. Failure imagery (thoughts of reinjury) was found in an experiment by Budney and Woolfolk (1990) to be stronger in lowering performance than successful imagery is in improving performance.

Theme four: the effects of the imagery intervention on the injured skier's imagery usage are related to her ability to control images positively. The injured skier learned how to stop her thoughts (i.e., if she started thinking of her fall) and think positively of skiing. Rotella and Heyman (1986) and Rotella (1988) believe that imagery can be taught to control the thoughts of reinjury that could lead to increased anxiety. Controllability according to Denis (1985) is the second of three requirements needed for imagery to be effective. He defines controllability as the ability to produce repeated images. Without controllability learning would be hindered because exact repetitions would not be possible. The difference between the injured skier's two rehabilitation experiences is that after the positive

performance imagery intervention, she was able to control her thoughts of reinjury and think positively of skiing.

Theme five: the injured skier now uses imagery with structure and regularity since the imagery intervention. Before the imagery intervention, the injured skier would only image herself falling or not use imagery at all during both of her rehabilitation sessions. She now uses positive performance imagery approximately two times a day. There was a two to three month break from skiing between her first skiing experiences (she skied for about one month) and a summer racing camp. During this break, the injured skier continued to use positive performance imagery on her own to prepare for the summer race camp experience. The researcher's only instruction after the positive performance imagery session was to use imagery on a daily basis until she skied again. Using imagery on a regular basis is necessary for an imagery program to succeed, according to Smith (1987), Orlick (1986), and Weinberg (1988). Based on the fact that the injured skier continued to use positive performance imagery during the summer break, she believed that imagery affected her skiing positively.

Theme six: using positive performance imagery during her hip dislocation rehabilitation reduced the injured skier's perceived anxiety when she returned to skiing. When the injured skier returned to skiing after her tibia fracture, she was more nervous as compared to when she went skiing after her hip dislocation. She attributes the difference in her nervousness to positive performance imagery and her previous experience (tibia fracture). According to Paivio's (1985)

Analytic Framework for Imagery Effects theory, when there is a negative image (reinjury or of falling) the emotions that accompany that image may be negative (increased anxiety or nervousness), too. The purpose of the positive performance intervention was goal-orientated, as the injured skier was instructed to always be successful in her skiing. If she imaged herself falling (or reinjury) during unstructured moments, she was instructed to stop the thought, back up the image, and ski though that moment successfully. Seeing herself as successful every time she thought of skiing, even in unstructured moments, had a positive effect on her arousal (decreased anxiety or nervousness), which supports Paivio's (1985) theory. During the injured skiers tibia fracture rehabilitation, she did not know how to stop her thoughts and her imagery of falling or reinjury were not controlled. The images of falling or reinjury had a negative effect on her arousal (increased anxiety or nervousness), and which supports Paivio's (1985) theory. Hall et al. (1996) and Vadocz, et al. agree, based on separate studies, there is a relationship between imagery use and state anxiety.

Theme seven: positive performance imagery during her hip dislocation rehabilitation enabled the injured skier to regain the perceived level of performance prior to injury. The injured skier's perceived skiing performance after her tibia fracture was described as: "tentative," "cautious," and "going really slow." She perceived her first skiing performance after the hip dislocation as feeling like she "was skiing yesterday," explaining, "'Cause, I practiced it so much in my head before I did it [ski] I was ready to go back up." In a published

interview by Orlick and Lee-Gartner (1993), a former Canadian Olympic downhill ski racer who rehabilitated from two knee injures during her career had the same comment that the injured skier had about the effect of imagery on her return to skiing: "I had already succeeded in being able to imagine myself skiing perfectly and I did it throughout the six months of recuperation. When I put my skis on it was like I wasn't even off of them." The difference in the injured skier's performance when she returned to skiing after her hip dislocation compared to her tibia fracture was attributed to positive performance imagery usage during rehabilitation. During her tibia fracture rehabilitation period, the only imagery she used was uncontrolled, unstructured, and of reinjury [failure]. Budney and Woolfolk (1990) found that failure imagery (i.e., thoughts of reinjury) was stronger in lowering performance than successful imagery was in enhancing performance. When the injured skier returned to skiing after her tibia fracture, the thoughts of reinjury may have been accompanied by increased arousal (anxiousness and nervousness) which negatively affected her skiing performance her first day back on snow. The positive performance imagery she practiced after the intervention may have been accompanied by decreased arousal (anxiety and nervousness) which positively affected her skiing performance her first day back on snow. What she imaged (skiing successfully) for the last four weeks of her hip dislocation rehabilitation is what she got (feeling like she skied yesterday) according to Denis (1985). This result could account for the injured athlete's perception of increased nervousness and lowered performance after her tibia fracture compared to the hip dislocation.

Conclusion

The hypotheses, 1) positive performance imagery intervention will reduce an injured skiers perception of anxiety when returning to skiing, and 2) enable the skier to regain perceived level of performance prior to injury when compared to a previous injury experience, were supported. The injured skier did perceive lower anxiety when she returned to skiing after her hip dislocation compared to her tibia fracture. She rated her level of nervousness higher for each tibia fracture recollection compared to her hip dislocation. The injured skier did imagine herself skiing successfully after the positive performance imagery intervention, which made her feel good about skiing. When she actually returned to skiing, the good feelings she had were related to her imagery, and lifted her confidence and made her feel comfortable to be on skis again. This is evident when she states: "I know how to imagine good thoughts. I can change my thoughts to good things," and "Cause I practiced it so much in my head before I did it, I was ready to go back up," and "I was so excited I knew I could do it," and "It [imagery] makes me feel more confident when I do it." The injured skier experienced thoughts of reinjury with both rehabilitations, however, after the positive performance imagery intervention, she was able to control her thoughts and think of skiing positively. The change in her perceived performance was also remarkable. She described her first skiing experience after her hip dislocation as "like I was skiing yesterday," compared to being "tentative" and "cautious" after her tibia fracture.

It has been four years since the injured skier's tibia fracture and her memory of that experience may not be as accurate as if she had been

interviewed shortly after rehabilitation. The length of her hip dislocation rehabilitation period was two months compared to her tibia fracture rehabilitation, which lasted 11 months. The tibia fracture rehabilitation was remarkably longer and could have been a factor in her pre-performance anxiety and performance comparisons. Moreover, the previous experience with an injury could have also influenced her perceived level of anxiety and performance, although she did attribute the difference between her two skiing experiences to imagery.

The subject's imagery usage before the intervention and her skiing ability before her injury aided the positive performance imagery intervention. The imagery intervention for this study was brief, lasting only one hour. A more in depth imagery intervention may be necessary, depending on the imagery use and the skiing ability of the subject. For example, if the subject is a beginner or intermediate athlete, her or his imagery will not benefit from clear or vivid visualizations which are necessary for imagery to be effective. Also, if the subject is a highly skilled performer but has not used imagery before her or his injury, a more basic imagery intervention would be necessary.

It is suggested that an investigation should be undertaken to find empirical evidence to support the case study. The investigation should include a pre- and post-injury pre-competition anxiety measurement, which is important for a true pre-competition anxiety comparison. A control group should also be included for an imagery intervention group comparison to a non-imagery intervention group. A longitudinal study would be necessary to raise the number of injured subjects to a significant level. Depending on the sport and number of athletes available

within an area, there may only be one to two injuries a season. Over ten years this would still mean a low number of injured subjects, but if the intervention were consistent, the findings would be significant.

The effectiveness of positive performance imagery intervention is variable; it depends on the athlete's level of performance, imagery usage before injury, thoughts of reinjury, timing of the intervention, length of the intervention, and adherence to the intervention. Some specific questions to guide future research include the following: Is the athlete a beginner, intermediate, or elite performer? What was the athlete's imagery usage before injury, how often did they use it, when did they use it, where did they use it, and what is the level of their imagery ability? How often does the injured athlete have thoughts of reinjury and when do those thoughts occur? When should the positive performance imagery intervention begin for best results, soon after injury, four weeks after injury, or three weeks before they are to perform? Should the intervention be continuous, periodic, or a single session? How often is the injured athlete using positive performance imagery on their own? All of these variables need to be investigated so we can fully understand the effectiveness of positive performance imagery during rehabilitation. In the meantime, a positive performance imagery intervention for an injured athlete should not be denied during a rehabilitation period.

APPENDICES

APPENDIX A

PRELIMINARY INTERVIEW QUESTIONS AND ANSWERS

1) What was your injury?
   I dislocated my left hip.
2) What day was your injury (month & day)?
   January 25, 1998
3) Have you been injured skiing before your most recent injury?
   I have broken my tibia in my left knee.
4) Is this most current injury similar to other injuries you have had?
   No, it is not similar.
5) How many times have you been injured?
   I have had 2 major injuries.
6) How long since your last injury?
   It has been 6 months
7) Before your (present) injury, did you practice any sport psychological skills before you raced? Please explain in as much detail as you can.
   I had never practiced sport psychological skills before I raced.
8) Did someone explain your injury to you in detail? If so, who (Doctor, Physical Therapist, Athletic Trainer, etc.)?
   My Doctor and physical therapist explained my injury in detail.
9) What was the severity of your injury?
   It was a 2 inch posterior dislocation.
10) Did the injury require surgery?
   It was a closed reduction surgical procedure.
11) What was your prognosis?
   My prognosis was full recovery in 9 months without complications.
12) What image of your injury do you have in your mind?
   I see my leg bone up next to the bottom of spine.
13) Are you able to imagine what the healing process looked like? Please explain in as much detail as you can.
   I can see my muscles tightening back into place and growing stronger.
14) Have you had any thoughts of reinjury this week?
   I have seen myself getting reinjured about 5 times since my crash.
15) (if so) How often?
   1 - 5 times 6 - 10 times 11+ times
   (no answer given)

16) If you ever had thoughts of reinjury, what did you see (please be specific)?

I have seen myself landing on my knee and pushing my hip out of place on the soccer field and the ski slope again.

17) How many rehabilitation sessions did you have scheduled? Where were the sessions (i.e. hospital, clinic, home, etc.) held?

I had 14 rehab. sessions scheduled, none were missed.

18) Did you do anything to motivate yourself to do your rehabilitation? Please explain. Do you think it helped? How did it help?

I thought of being back on skis and the sooner I healed the sooner that time would come.

19) Did you set any goals for your rehabilitation? What were they? Do you think it helped? How did it help?

I set goals with my weights when I worked out for a certain amount of time.

20) Did you attend all of your scheduled rehabilitation sessions? If not why and how many did you miss?

Answered in #17

21) Have you had any complications or set-backs with your rehabilitation? Please describe.

I can't run as fast as I did before my injury and I am not as flexible.

22) What day did you start skiing again?

The first time I skied again was on March 30, 1998.

23) What day did you start running gates again?

I have not started running gates yet.

24) Have you "worked out" (lift weights, bicycle, run, etc.) aside from your scheduled rehabilitation sessions? If so how many times and what did you do?

I do work out and I worked out 5 out of 7 days while in rehab.

25) Please, take time to write down any thoughts you have (had) about:

a) the injury itself

(no answer given)

b) the rehabilitation process

(no answer given)

c) support (or lack of) that you are (or are not) receiving

I don't think I would ever have come this far without the support I have received from friends and family.

d) whatever else you care to add.

(no answer given)

Also, include how you are coping with these thoughts (REMEMBER, no one will see these comments but me)

APPENDIX B

PERSONAL DATA QUESTIONNAIRE AND ANSWERS

The following demographic data is important for classifying the results. Please circle or fill in the appropriate response.

SEX: Female Male

AGE: 14

NUMBER OF YEARS SKIING: 12

NUMBER OF YEARS RACING: 5

COACHING PROGRAM: _____
(Please Print)

COACH'S NAME: _____
(Please Print)

APPENDIX C

LETTER OF INTRODUCTION FOR HIGH SCHOOL PARENTS

Date

Barbara Scott-Mozen
Michigan State University
P.O. Box 3718
Olympic Valley, CA 96146
916-581-4523

Parent, or Guardian

City, California Zip

Dear ,

I am a graduate student pursuing my Master's degree in Sport Psychology at Michigan State University. To fulfill my thesis requirement, I am studying the effects of sport psychology skills during rehabilitation in the reduction of precompetition anxiety, increase of positive mood states, and achievement of pre-injury performance levels. The reason why I believe this study is important is because too often I have seen and heard others comment that following an injury, ski racers never perform as they did before the injury.

U.S. Ski Team athletes and coaches recognized the importance of psychological recovery from injury when they rated it as one of the five most important mental skills. High precompetition anxiety has been an explanation for an athlete's failure to perform well after injury. If sport psychology skills can reduce skiers' (for example, your daughter's or son's) precompetition anxiety, perhaps they can race as well as they did before their injury.

The participants I have defined for my study are alpine ski racers aged 13 - 21, reflecting various ability levels. Participants will complete three surveys within two hours before one ski race. The three surveys should not take more than twenty minutes to complete. While we hope no one is injured during the season, I speak from experience when I say that injuries do occur. If participants experience a lower extremity injury that prevents them from skiing, they may be asked to participate in a positive performance imagery intervention until they are able to race again. The positive performance imagery intervention sessions involve meeting with the researcher intermittently (alternating no intervention for

nine consecutive weekdays with intervention for twelve consecutive weekdays) to practice imaging successful skiing through race courses until the injured skier's first race after rehabilitation. The sessions will be less than one half hour per session. A survey will be given every three weekdays during the rehabilitation period which will take less than ten minutes to complete. Also, injured participants will be given a logbook with specific questions to be answered weekly on their own. The logbook should not take more than twenty minutes per week to complete. The intervention and survey completion will be held in the injured participants home, school, or some other location that is convenient for the participant.

Participation is completely voluntary, and your daughter or son may refuse to participate and/or refuse to answer any questions at any time during the study without penalty or prejudice. There are no risks involved to your daughter or son through their participation. The benefits of your daughter or son participation would signify an important contribution to research in sport psychology, recovery from a ski injury, and positive performance imagery. However, no beneficial effects are guaranteed to your daughter or son.

Informed consent forms are required from the skiers' parents, or guardians if athletes are to participate in the study. Assent from your daughter or son is also required. All responses will remain confidential. Please be assured that your daughter's or son's data will remain anonymous and will only be presented in either summary form or by a number code.

Enclosed is an informed consent form that will include your daughter or son in the study. Included is a short questionnaire asking for your daughter's or son's race program and/or the name of their coach if they are involved in a program apart from their high school team. I would appreciate it if you would return the informed consent form and questionnaire, in the self-addressed stamped envelope, by December , 1997. A postcard will be sent to you when the first surveys are scheduled, if I have received your informed consent.

If you have any questions, I will be happy to answer them and I can be contacted at 530-581-4523. You may also contact my advisor at Michigan State University, Dr. Lynette Overby, at 517-355-3775. Thank you, in advance, for your consideration regarding this study.

Sincerely,

Barbara J. Scott-Mozen

APPENDIX D

INFORMED CONSENT FORM FOR PARENTS OF HIGH SCHOOL SKI TEAM MEMBERS

The purpose of this study is to investigate the relationship of positive performance imagery used during rehabilitation of a ski injury in the reduction of precompetition anxiety, increase of positive mood states, and achievement of pre-injury performance levels. Participants will complete three surveys (Competitive Sport Anxiety Inventory - 2, Profile of Mood States - Short Form, and personal data questionnaire) within two hours before one ski race. The three surveys should not take more than twenty minutes to complete. If participants experience a lower extremity injury that prevents them from skiing, they may be asked to participate in a positive performance imagery intervention until they are able to race again. The positive performance imagery intervention sessions involve meeting with the researcher intermittently (alternating no intervention for 9 weekdays with intervention for 12 weekdays) to practice imaging successful skiing through race courses until the injured skier's first race after rehabilitation. The sessions will be less than one half hour per session. A survey will be given every three weekdays during the rehabilitation period which will take less than ten minutes to complete. Also, injured participants will be given a log book with specific questions to be answered weekly on their own. The log book should not take more than twenty minutes per week to complete. The intervention and survey completion will be in the injured participants home, school, or some other location that is convenient for the participant.

All responses will remain confidential. Please be assured that your daughter's or son's data will remain anonymous and will be presented in either summary form or by a number code.

In order for your daughter or son to be a part of this study, we must have your consent. Please communicate the content of this consent form to your daughter or son before giving your consent for her or his participation. Assent from your daughter or son is also required. If you have any questions, I will be happy to answer them and I can be contacted at 530-581-4523. You may also contact my advisor at Michigan State University, Dr. Lynette Overby, at 517-355-3775.

INFORMED CONSENT

The study, and my daughter's or son's part in the study, have been defined and explained to me, and my daughter or son understands the explanation. I understand that my daughter's or son's participation is completely voluntary, and they may refuse to participate and/or refuse to answer any questions at any time during the study without penalty or prejudice. I understand that my daughter's or son's participation in this study does not guarantee any beneficial results to me or my child. I understand that there are no known risks involved in participating in this study. I further understand that any data or answers to questions will remain confidential with regard to my daughter's or son's identity.

I hereby agree to allow my daughter or son, _____
to participate as a volunteer in this study. (please print)

_____ _____
Parent or Legal Guardian Date

I understand my rights as a participant in this study and do agree to participate as a volunteer.

_____ _____
Study Participant Date

QUESTIONNAIRE

Name of program and/or coach(es):

_____
(Please print)
Program and/or coaches phone number:

_____

APPENDIX E

LETTER OF INTRODUCTION FOR FAR WEST USSA PARENTS

Date

Barbara Scott-Mozen
Michigan State University
P.O. Box 3718
Olympic Valley, CA 96146
916-581-4523

Parent, or Guardian

City, California Zip

Dear ,

I am a graduate student pursuing my Master's degree in Sport Psychology at Michigan State University. To fulfill my thesis requirement, I am studying the effects of sport psychology skills during rehabilitation in the reduction of precompetition anxiety, increase of positive mood states, and achievement of pre-injury performance levels. The reason why I believe this study is important is because too often I have seen and heard others comment that following an injury, ski racers never perform as well as they did before an injury.

U.S. Ski Team athletes and coaches recognized the importance of psychological recovery from injury when they rated it as one of the five most important mental skills. High precompetition anxiety has been an explanation for an athlete's failure to perform well after injury. If sport psychology skills can reduce skiers' (for example, your daughter's or son's) precompetition anxiety, perhaps they can race as well as they did before their injury.

The participants I have defined for my study are alpine ski racers aged 13 - 21, reflecting various ability levels. Participants will complete three surveys within two hours before one ski race. The three surveys should not take more than twenty minutes to complete. While we hope no one is injured during the season, I speak from experience when I say that injuries do occur. If participants experience a lower extremity injury that prevents them from skiing, they may be asked to participate in a positive performance imagery intervention until they are able to race again. The positive performance imagery intervention sessions

involve meeting with the researcher intermittently (alternating no intervention for nine consecutive weekdays with intervention for twelve consecutive weekdays) to practice imaging successful skiing through race courses until the injured skier's first race after rehabilitation. The sessions will be less than one half hour per session. A survey will be given every three weekdays during the rehabilitation period which will take less than ten minutes to complete. Also, injured participants will be given a logbook with specific questions to be answered weekly on their own. The logbook should not take more than twenty minutes per week to complete. The intervention and survey completion will be held in the injured participants home, school, or some other location that is convenient for the participant.

Participation is completely voluntary, and your daughter or son may refuse to participate and/or refuse to answer any questions at any time during the study without penalty or prejudice. There are no risks involved to your daughter or son through their participation. The United States Ski Association (USSA) has endorsed this study. The benefits of your daughter or son participation would signify an important contribution to research in sport psychology, recovery from a ski injury, and positive performance imagery. However, no beneficial effects are guaranteed to your daughter or son.

Informed consent forms are required from the skiers' parents, or guardians, if athletes are to participate in the study. Assent from your daughter or son is also required. All responses will remain confidential. Please be assured that your daughter's or son's data will remain anonymous and will only be presented in either summary form or by a number code.

Enclosed is an informed consent form to include your daughter or son in the study. Included is a short questionnaire asking for your daughter's or son's race program and/or the name of their coach. I would appreciate it if you would return the informed consent form and questionnaire, in the self-addressed stamped envelope, by December , 1997. A postcard will be sent to you when the first surveys are scheduled, if I have received your informed consent.

If you have any questions, I will be happy to answer them and I can be contacted at 530-581-4523. You may also contact my advisor at Michigan State University, Dr. Lynette Overby, at 517-355-3775. Thank you, in advance, for your consideration regarding this study.

Sincerely,

Barbara J. Scott-Mozen

APPENDIX F

INFORMED CONSENT FORM FOR PARENTS OF FAR WEST UNITED STATES SKI ASSOCIATION MEMBERS

The purpose of this study is to investigate the relationship of positive performance imagery used during rehabilitation of a ski injury in the reduction of precompetition anxiety, increase of positive mood states, and achievement of pre-injury performance levels. Participants will complete three surveys (Competitive Sport Anxiety Inventory - 2, Profile of Mood States - Short Form, and personal data questionnaire) within two hours before one ski race. The three surveys should not take more than twenty minutes to complete. If participants experience a lower extremity injury that prevents them from skiing, they may be asked to participate in a positive performance imagery intervention until they are able to race again. The positive performance imagery intervention sessions involve meeting with the researcher intermittently (alternating no intervention for 9 weekdays with intervention for 12 weekdays) to practice imaging successful skiing through race courses until the injured skier's first race after rehabilitation. The sessions will be less than one half hour per session. A survey will be given every three weekdays during the rehabilitation period which will take less than ten minutes to complete. Also, injured participants will be given a log book with specific questions to be answered weekly on their own. The log book should not take more than twenty minutes per week to complete. The intervention and survey completion will be in the injured participants home, school, or some other location that is convenient for the participant.

All responses will remain confidential. Please be assured that your daughter's or son's data will remain anonymous and will only be presented in either summary form or by a number code.

In order for your daughter or son to be a part of this study, we must have your consent. Please communicate the content of this consent form to your daughter or son before giving your consent for her or his participation. Assent from your daughter or son is also required. If you have any questions, I will be happy to answer them and I can be contacted at 530-581-4523. You may also contact my advisor at Michigan State University, Dr. Lynette Overby, at 517-355-3775.

INFORMED CONSENT

The study, and my daughter's or son's part in the study, have been defined and explained to me, and my daughter or son understands the explanation. I understand that my daughter's or son's participation is completely voluntary, and they may refuse to participate and/or refuse to answer any questions at any time during the study without penalty or prejudice. I understand that my daughter's or son's participation in this study does not guarantee any beneficial results to me or my child. I understand that there are no known risks involved in participating in this study. I further understand that any data or answers to questions will remain confidential with regard to my daughter's or son's identity.

I hereby agree to allow my daughter or son, _____
to participate as a volunteer in this study. (please print)

_____ _____
Parent or Legal Guardian Date

I understand my rights as a participant in this study and do agree to participate as a volunteer.

_____ _____
Study Participant Date

QUESTIONNAIRE

Name of program and/or coach(es):

_____
(Please print)

Program and/or coaches phone number:

_____

APPENDIX G

LETTER OF INTRODUCTION FOR FAR WEST USSA ADULTS

Date

Barbara Scott-Mozen
Michigan State University
P.O. Box 3718
Olympic Valley, CA 96146
916-581-4523

Adult USSA Member

City, California Zip

Dear ,

I am a graduate student pursuing my Master's degree in Sport Psychology at Michigan State University. To fulfill my thesis requirement, I am studying the effects of sport psychology skills during rehabilitation in the reduction of precompetition anxiety, increase of positive mood states, and achievement of pre-injury performance levels. The reason why I believe this study is important is because too often I have seen and heard others comment that following an injury, ski racers never perform as well as they do before the injury.

U.S. Ski Team athletes and coaches recognized the importance of psychological recovery from injury when they rated it as one of the five most important mental skills. High precompetition anxiety has been an explanation for an athlete's failure to perform well after injury. If sport psychology skills can reduce skiers' precompetition anxiety, perhaps they can race as well as they did before their injury.

The participants I have defined for my study are alpine ski racers aged 13 - 21, reflecting various ability levels. Participants will complete three surveys within two hours before one ski race. The three surveys should not take more than twenty minutes to complete. While we hope no one is injured during the season, I speak from experience when I say that injuries do occur. If participants experience a lower extremity injury that prevents them from skiing, they may be asked to participate in a positive performance imagery intervention until they are able to race again. The positive performance imagery intervention sessions involve meeting with the researcher intermittently (alternating no intervention for

nine consecutive weekdays with intervention for twelve consecutive weekdays) to practice imaging successful skiing through race courses until the injured skier's first race after rehabilitation. The sessions will be less than one half hour per session. A survey will be given every three weekdays during the rehabilitation period which will take less than ten minutes to complete. Also, injured participants will be given a logbook with specific questions to be answered weekly on their own. The logbook should not take more than twenty minutes per week to complete. The intervention and survey completion will be held in the injured participants home, school, or some other location that is convenient for the participant.

Participation is completely voluntary, and you may refuse to participate and/or refuse to answer any questions at any time during the study without penalty or prejudice. There are no risks involved to you through your participation. The United States Ski Association (USSA) has endorsed this study. The benefits of your participation would signify an important contribution to research in sport psychology, recovery from a ski injury, and positive performance imagery. However, no beneficial effects are guaranteed to you.

An informed consent form is required if you are to participate in the study. All responses will remain confidential. Please be assured that your data will remain anonymous and will only be presented in either summary form or by a number code.

Enclosed is an informed consent form to indicate your participation in the study. Included is a short questionnaire asking for your race program and/or name of your coach. I would appreciate it if you would return the informed consent form and questionnaire, in the self-addressed stamped envelope, by December , 1997. A postcard will be sent to you when the first surveys are scheduled, if I have received your informed consent.

If you have any questions, I will be happy to answer them and I can be contacted at 530-581-4523. You may also contact my advisor at Michigan State University, Dr. Lynette Overby, at 517-355-3775. Thank you, in advance, for your consideration regarding this study.

Sincerely,

Barbara J. Scott-Mozen

APPENDIX H

INFORMED CONSENT FORM FOR ADULT MEMBERS OF FAR WEST UNITED STATES SKI ASSOCIATION

The purpose of this study is to investigate the relationship of positive performance imagery used during rehabilitation of a ski injury in the reduction of precompetition anxiety, increase of positive mood states, and achievement of pre-injury performance levels. Participants will complete three surveys (Competitive Sport Anxiety Inventory - 2, Profile of Mood States - Short Form, and personal data questionnaire) within two hours before one ski race. The three surveys should not take more than twenty minutes to complete. If participants experience a lower extremity injury that prevents them from skiing, they may be asked to participate in a positive performance imagery intervention until they are able to race again. The positive performance imagery intervention sessions involve meeting with the researcher intermittently (alternating no intervention for 9 weekdays with intervention for 12 weekdays) to practice imaging successful skiing through race courses until the injured skier's first race after rehabilitation. The sessions will be less than one half hour per session. A survey will be given every three weekdays during the rehabilitation period which will take less than ten minutes to complete. Also, injured participants will be given a log book with specific questions to be answered weekly on their own. The log book should not take more than twenty minutes per week to complete. The intervention and survey completion will be in the injured participants home, school, or some other location that is convenient for the participant.

All responses will remain confidential. Please be assured that your data will remain anonymous and will only be presented in either summary form or by a number code.

In order for you to be a part of this study, we must have your consent. If you have any questions, I will be happy to answer them and I can be contacted at 530-581-4523. You may also contact my advisor at Michigan State University, Dr. Lynette Overby, at 517-355-3775.

INFORMED CONSENT

The study, and my part in the study, have been defined and explained to me, and I understand the explanation. I understand that my participation is completely voluntary, and I may refuse to participate and/or refuse to answer any questions at any time during the study without penalty or prejudice. I understand that participation in this study does not guarantee any beneficial results to me. I understand that there are no known risks involved in participating in this study. I further understand that any data or answers to questions will remain confidential with regard to my identity.

I understand my rights as a participant in this study and do agree to participate as a volunteer.

_____ _____

Study Participant Date

QUESTIONNAIRE

Name of program and/or coach(es):

_____

(Please print)

Program and/or coaches phone number:

_____

APPENDIX I

ADAPTATION OF WEINBERG'S VIVIDNESS EXERCISE (Weinberg, 1988)

You are to recall as vividly as possible a time when you performed very well. If you can recall a finest hour in recent memory, use that. Your visualization will cover three specific areas of recall: visual, auditory, and kinesthetic.

In visual recall you are to picture how you look when you're racing well. You should notice that you look different when you are racing well as opposed to when you are racing poorly. You ski differently, carrying your head and shoulders differently. When an athlete is confident on the inside, it shows on the outside. Try to get as clear a picture as possible of what you look like when you are racing well. Reviewing films of past good performances can substantially help to crystallize this visualization.

For auditory recall, listen in your mind to the sounds you hear when you are racing well, particularly internal dialogue you have with yourself. There is often an internal silence that accompanies your best performances. Listen to it. What is your internal dialogue like? What are you saying to yourself and how are you saying it? What is your internal response when faced with adversity while in a race course?

For kinesthetic recall, recreate clearly in your mind all the bodily sensations you have when skiing well. How do your legs and arms feel? Do you

have a feeling of quickness, looseness, speed, or intensity in your body? Often, your skis have a distinctive feel when racing well. How do your skis feel coming out of the starting gate, turning left, turning right, and going through the finish? Focus on the bodily sensations that are associated with racing well.

APPENDIX J

TAPED INTERVIEW QUESTIONS AND ANSWERS

What I did was I took those questions that I gave you and I put your answers in and then I have some more questions based on your answers. So we will start with that.

1) Is this most current injury similar to other injuries you have had? And you said "No, it is not similar." What I want to know is how is this injury different? in relation to, I guess, your tibia fracture?

Yea, I dislocated my hip and my other injury was my tibia.

2) Was there any difference in your capability to walk around?

I wasn't in a cast with my dislocation and I could walk normally with crutches and after a couple weeks I decided that I was going to go off and start walking again without crutches and I did and that was kinda hard but with knee injury because I was in a cast for so long.

3) How old where you then, when you had the tibia fracture?

10.

4) So 4 years ago?

Uh huh.

5) Did you, was the tibia injury while you were in a race course or just free skiing?

I was getting ready for a race.

6) Getting ready for a race? How were you getting ready for a race?

I was warming up before the race.

7) Ah, so you were just free skiing, not running any gates or anything, just getting yourself psyched up, getting warmed up right before the kaboom?

Uh huh

8) Again talking about your tibia fracture If I had known you then, what would have I seen you experience during your rehabilitation ?

Well, I had to go to therapy a lot and that was really painful and then it was really hard getting around places, I was slower than everybody else. And I just, it was hard because I couldn't do the things I used to do and I still can't do things that I used to be able to do.

9) Because of the tibia fracture?

Yea

10) Like what?

My knee still bothers me when I play soccer. I used to have to wear a brace full time, now its only off and on and it can't bend as far as it

used to.

11) Now you said that you were 10, err 12 when that happened?

10

12) 10 and um O.K. Did you use any sport psychological skills during the rehabilitation period?

No

13) No, darn, O.K. What did you think about when you skied for the first time after that tibia fracture, (she - well) do you remember?

The first time I skied after my tibia fracture my dad took me to the exact same spot as when I broke it.

14) Was that at _____?

Yeah I was on _____. I thought I was never gona go on _____ again but my dad said this is what you are gonna do and I went on _____ and.

15) And _____ is the main race hill isn't it at _____ (She - Yea) and so you would have lots of, most of your competitions there when they were at home?

Uh huh (yes) and that's what I did for my hip too, well I didn't do it the first time but after my hip, when I came back skiing I knew I needed to go back and do it again because I couldn't help it so in the end I went back to the training garden at _____.

16) Oh, you were in the training garden at _____ when you did your hip?

Not in _____ but in _____.

17) Oh, but in _____.

It's the same thing.

18) Oh, it's the same thing, you just happened to be in _____ for your first skiing experience. You didn't ski at home?

Um Uh (no).

19) O.K. is that because your sister had a race down in _____?

Uh huh (yes).

20) Could you rate on a scale from 1 to 5 how you felt about going back, how, lets use the word anxious, nervous, how nervous you were 1 being not very nervous 5 being very nervous to get back on your skis again.

At points, at sometime I was very nervous to go back skiing.

21) What points were those.

What do you mean, like, how much the nervousness I had.

22) Well, I guess I am asking for a rating 1 to 5 how anxious

Probably a 4

23) 4. Was that right before you put your skis on, was that like a week before, was that

A day before.

24) A day before you started feeling.

I would think about it during the day before off and on and I would think oh my gosh.

25) Did you get any more nervous as you started driving towards _____ because you knew you were going to start skiing?

Yea.

26) And did you get any more nervous once you put your ski boots on?

Yea, I was shaking.

27) Shaking and how about once you clicked in, into your bindings?

It felt really good to click into my bindings.

28) It felt good, so maybe you got a little bit less nervous once you clicked in?

Uh huh, I was really excited I was going Yes.

29) O.K. so then you turned, then things started turning around, feeling less nervous, more confident?

And plus my coaches I would tell them I'm really nervous to go back skiing. They said there was no reason to be because you know you are going to do fine.

30) So they were supporting you during this?

Yea.

31) That's good. So you would say that you gave a rating of 4 the day before but once you got your skis on (clicking into the bindings) then where did it go?

I got really anxious to go up the hill and do it because I hadn't done it in so long and when I was in rehabilitation I would miss skiing so much because there was nothing else to do, I would just sit home (sounds like she said at this point - woe is me).

32) Did you miss your friends?

Uh huh and at times I would be up at _____, like talking to my coaches about my skis and my Dad was up there and I thought about it a couple of times, just going in the locker room and getting all my stuff.

33) And this is for the tibia fracture?

No, my dislocation.

34) Oh no I'm talking about the tibia fracture.

Oh, same thing though

35) Same thing. Very same?

Pretty much yea.

36) Pretty much, O.K.

When I was out of my cast.

37) O.K. Did you talk to your coaches a lot after your tibia fracture?

Uh huh(yes)

38) Yea. They were good support?

Uh huh(yea)

39) O.K. good, that's important, that's a good thing.

And I did talk to my coaches a lot because of the support and my sister. If I didn't have my sister skiing I don't think I'd be up there as much. I was up there supporting my sister most of the time at her races and everything, so, I would have my coaches there telling me, telling me now your sister is doing it and this is what you are going to be doing.

40) Was your sister injured, at one time?

No.

41) No?

No she was never injured for long. She has been hit with a ski boot a couple of times but.

42) That doesn't count. Just because I was wondering if, maybe you were telling me if your sister was injured, and your coaches were telling you then well see she's back skiing she's doing it, you could use her as a role model.

No they were just saying see now _____ you have to, when you come back you are gonna be just like your sister. And my sister was very supportive too.

43) Yes is she?

Yea

44) Good Good. After your tibia fracture, we're still on that one, sorry, because I'm trying to compare.

All right.

45) O.K. What did you think about when you got into a race course again?

That was scary

46) Was it scary

Usually when I'm in a race course, you know, you think about it but you're not as uptight as you are but the first race course I went back into was a training course and usually I'm not that uptight about a training course you just want to do your best and I was even more nervous in the training course than I was in an actual race. So.

47) Oh O.K so even though you were injured out of the race course it still made you very nervous?

It was so close because I was training for the race.

48) You were training for the race

My coaches were telling me, I want you to do this kind of turn and this kind of turn

Oh O.K. the same kind of turns you would make in a race course, they were having you practice on the side of the hill getting ready for the race. I'm also trying to be very clear about this because lets say if someone were to read the report, not that they would know your name, but lets say they don't know

anything about skiing so if we bring it back to the basics so I'm sure of what we are talking about. That's why I keep going back.

49) If you were to rate that one experience, when you were back in a race course again, on that same scale of nervousness from 1 being low nervous to 5 being high?

Definitely 5

50) 5?

I was very nervous

51) More nervous than the day before you were to go back to skiing?

Uh huh (yes)

52) Because you rated that a 4, so I'm just

Yea.

53) Great. I asked you before your present injury with the hip dislocation, did you practice any sport psychological skills before you raced? And you said "I had never practiced sport psychological skills before I raced" Did you mean that you learned some sport psychological skills through racing? Like did you use imagery when you ah?

Well, I never did before I met you I like psych myself up, you know I'd go through the course but

54) You would go through the course in your own mind.

Yea

55) Well that's imagery, you were using imagery. Did you use any goal setting, did you set goals for yourself?

Uh huh (yes), I would set goals that I wanted to beat a certain amount of people in my competition. I have a couple people that beat me in my competition and before every race that's my goal is to beat those people.

56) So more performance.

Uh huh (yes)

57) How about ability?

You mean like skill?

58) Skill, yea.

Well, there's things that I work on in training that my coaches say now this is what you need to do before you get into the race because it'll help you out so much and that's what I usually work on in the course and when I actually do it, it feels pretty good because I go a lot faster.

59) In what context would you use these skills? Like every day, every training day, every day whether you ski or not ski, would you just use them when you are training, would it be apart of your training when you would use imagery?

Uh huh (yes), that's a big part before we go out training is imagery. Like our coaches make our training just like a race. We go through the course and we memorize the course before we start training it. Then we go up and we discuss what we need to do in the course. We take time to think about what we need to do and we have to imagine ourself doing the correct positions to take in the course.

60) How are you seeing yourself when you do that? Is it like your watching a video?

I can see myself in me and I can see myself from behind.

61) Good. Were you feeling your muscles moving? Let's say you want to make a left hand turn so your powering through and your really pressing down on your

When I use imagery I can like feel the way my muscles should feel when I go through the course and I can also see what's its suppose to look like and that helps a lot when get out, also see what's it suppose to look like.

62) Do you see any of the colors? of the gates - red, blue.

Uh huh (yes)

63) Can you actually hear?

The wind.

64) The wind when you're imaging?

Uh huh (yes). Mostly in races I can.

65) In races you can do that. Can you hear the snow as your going through it or the ice you know as it sounds when your skis are?

Uh huh (yes).

66) So when you train and when you race is when you use those skills?

Right

67) What is your opinion of those skills?

The imagery skills?

68) Yea

They help a lot, because if I didn't use imagery there'd be things that wouldn't work.

69) Because?

Its a big part of racing to prepare

70) To prepare yourself.

Uh huh (yes)

71) Does it help you relax?

Yea, one time at a race I was very late and I went up to the course and I went up through the course really fast to see what it was and I came back up and I just realized that I didn't memorize the course at all and if it wasn't for my friend I wouldn't have known the course and I have the most trouble going through courses that I don't prepare myself for, I don't do it. So, we went through the course like 6-7

times and she took me through it and I felt really confident before and I did very well that race.

72) The question was - Did someone explain your injury to you in detail and if so, who? You said that "My doctor and physical therapist explained my injury in detail." What is your opinion of your Dr.'s attitude when she/he gave you the diagnosis for your tibia fracture? Was it a positive attitude, was it a negative attitude, or was it just kind of bland? Do you remember?

The first time somebody told me I dislocated my hip I was on drugs, because I was in so much pain. But I remember their being very surprised.

73) They were surprised?

Very surprised because they don't usually see this type of injury in skiing. My doctor said you must have been going really fast because I usually see this in car crashes, major car crashes, not in skiing.

74) How did that make you feel?

Pretty good because I was going pretty fast. Like yea.

75) Do you think their attitude, in their being surprised do you think it affected how you looked at your injury and at your recovery?

Well.

76) Or did it have no effect at all, its there?

I don't think so.

77) Ok.Ok. The question was - What image of your injury do you have in your mind and you answered "I see my leg bone up next to the bottom of spine." What image of that part of the body do you have now?

(she shrugged)

78) O.K. you answered I see my leg bone up next to the bottom of my spine when I asked you if you had an image of your injury. What image of that part of your body do you have now?

It's back to normal.

79) Back to normal, O.K.

That's also what my doctor said, that they were very surprised that I wasn't paralyzed because it was so close to my spine

80) So what you see now is everything back now as it should be.

Uh huh (yes).

81) O.K. About your hip dislocation I asked - Have you had any thoughts of reinjury this week? And your answer was "I have seen myself getting reinjured about 5 times since my crash." When did these thoughts occur specifically, those 5 times?

Probably when I'm getting ready to go out skiing, getting changed, putting on my boots, I just think about what like will happen.

82) So you have skied 5 times since your hip dislocation?

I have actually skied a lot more than that.

83) Oh good.

And I'm leaving for New Zealand ski camp on Monday.

84) Oh good for you. So did you had any thoughts of your injury right after the injury, did you play back what happened?

Um huh (yes)

85) Yes. Would you say that happened quite a few times or like maybe 1 -5, 6 - 10.

Well, in the hospital I thought about it a lot and dreamed about it.

86) Did you. How long were you in the hospital?

For 3 days

87) 3 days, so those 3 days right after your injury you thought about it a lot.

Yea

88) That's natural. How about right before, 4-5 weeks before you were to ski again, did you have any thoughts.

No. I only thought about it right before I was going to ski. I haven't really thought about it.

89) When I met with you and we went though the imagery did that stimulate any recurring thoughts of your ah.

I thought about it, but then I really didn't think about reinjury, I was thinking about how not to think about it.

90) So, you were trying to think positively.

Yea, how to make myself not think of it if it ever came up.

91) Like using the thought stoppage.

Uh huh (yes)

92) We talked about that didn't we?

Uh huh (yes)

93) How many rehab. sessions did you have scheduled? You said you had 14 rehab. sessions. Where were the sessions?

In the _____ therapy clinic.

94) In the therapy clinic. Who else was involved?

My therapist.

95) Did you do anything to motivate yourself to do your rehabilitation? And you answered "I thought of being back on skis and the sooner I healed the sooner that time would come." And my next question is - Do you think this helped with your rehabilitation?

Uh huh (yes)

96) How did it help?

Well, some people that with their rehabilitation don't seem that motivated to do it and just say oh my gosh I'm here, oh well. But I was thinking that if can just workout, I was working out twice as hard as anybody else in that clinic because I wanted to come back so bad.

97) The question was - Did you set any goals for your rehabilitation? And you answered "I set goals with my weights when I worked out for a certain amount of time." And my next question is when was that certain amount of time?

Well, what I meant was, when I worked out I would, every time I'd go in I'd either stay there and I'd have certain times when I would move up a weight.

98) Did your Dr. or therapist set goals for you for your rehabilitation?

They'd wanted times when they thought I was gonna be recovered and usually their thoughts were off date cause I would do it faster.

99) You would work faster than the goals that they set.

Uh huh (yes)

100) Did you have any say in developing those goals that they had set for you?

Well, when I was in therapy, one of my therapist asked me when I wanted to start skiing again, and I set the goal for a month later, I wanted to do it a month later. She said, well I don't know about that. And it happened a month later.

101) So they did take you opinion into consideration or didn't they?

They didn't. They thought it was going to take two months to go back. Well after the time I'd been in therapy, I'd been in therapy half way, they said well it might take about 2 more months but I worked at it and it only took 1 month.

102) The goals related more to the weight training, the physical rehab. or was it time to get back? Oh how can I say this, did they relate to, O.K. today I want you to lift 4 pounds, a week from now we want you to lift 8 pounds? I know it's not a lot but just as an example. Or did it relate to, I want you to function at this point, I want your range of motion.

They would use range of motion and when I was lifting.

103) Do you think that helped with your rehabilitation having that goal to reach?

But the muscle strengthening was very important because after I dislocated my hip my muscles were just hanging, they were stretched so much that they just kind of gave up. And my leg was longer than my other one, nobody believed me but finally they measured it and it was longer. And that was because the muscles weren't fully tightened.

104) So, it wasn't quite in the socket?

Yea, it was hanging out of the socket until my muscles had strengthen up and held it there again.

105) Did you have any goals for getting your muscles strengthen?

Well, I kinda wanted to walk normally again.

106) So that was your only goal, is to walk normally again?

Because, I was favoring my other side because one of my legs was longer and that was my goal. Because if I walk normally and if I

would stand on my bad leg more, because I was standing on my good leg most of the time, then it would come back into socket and strengthen up.

107) The question was - Have you had any complications or set-backs with your rehabilitation? And you answered "I can't run as fast as I did before my injury and I am not as flexible." My next question is - What would you like to see happen in regards to your speed and flexibility?

I've already conquered that.

108) You've already conquered it, good, good. That takes those three questions right out of there. Have you started running gates yet?

No

109) Just skiing?

My coaches won't let me.

110) O.K. that's fine. What do you think about when you see yourself running gates again? Do you have any thoughts of running gates again?

Uh huh (yes)

111) What do you see?

I see myself at ski camp and I picture last year when I was racing and I picture that course and I see myself going really fast.

112) Going really fast.

Uh huh (yes)

113) and always succeeding?

Uh huh (yes)

114) Good. This was the question - Have you "worked out" aside from your scheduled rehabilitation session? And you said "I do work out and I worked out 5 out of 7 days while in rehab." What are you doing to work-out now?

I go to the gym and I work out for an hour and a half usually and I ride my bike, I roller blade. Like today I rode my bike into town (side note - it is a 4-5 mile ride from her house into town) and worked out and went back, and then I roller blade, mountain biked, going to play soccer.

115) What do you do when you work out at the gym?

I lift weights and go running.

116) How many days a week do you think you do all this?

Probably 5 days a week.

117) Are you participating in any other sport(s) this summer?

Soccer.

118) Do you use any sport psychological skills for this sport?

Not really.

119) No. O.K.

Just skiing

120) Here is a new question - What issues did you feel up-front after your injury?

What do you mean?

121) Like I'm not going to be able to ski, I'm going to miss my friends, what am I going to do with my time.

Yea, I didn't know what I was going to do. Cause, during the school year I do a lot of sports, I do track and cross country (running) and basketball. And I didn't know what I was going to do because I couldn't do track after I dislocated it and I couldn't do cross country and I just came home and said hum, what am I going to do.

122) How about 1 month after, were there any issues that were any different, one month after?

I still thought about things that I couldn't do and knew that I needed to work out really hard if I wanted to do them again. So

123) And how about 2 months?

I was starting to do things that I wanted to but still.

124) If I had known you then, meaning at the time of your injury, at the time of the acute injury, right when you fell, what would have I seen you experience during your rehabilitation?

Like right afterwards?

125) Uh huh. Because I knew you towards the end.

Right afterwards I tried to get up but I don't think you mean that. After I got out of the hospital I had to learn how to use crutches and walk up and down stairs. I would always want to walk, I would always get up and forget that I had an injury, that I couldn't walk on my own.

126) Oh O.K. because you didn't have something there telling you like your cast to remind you perhaps

And I wasn't really thinking about my injury, so I'd get out of bed and actually walk, my mom would say _____ what are you doing, sorry, but when it started hurting I was like where are my crutches.

127) Did the rehabilitation process, did it make sense to you, what they had you do for your rehabilitation?

Yea

128) In your opinion what could have been done differently?

I think that we did every that we could.

129) What would have happened if you did not attend your rehabilitation?

My therapist would get really mad, she'd call me up and say _____ where were you and I'd say sorry. I'd miss out on all the stuff I needed to do and I'd be behind for the next time I came in, the goals I needed to reach for each time I came in wouldn't be met. So I'd have to work extra hard when I came in.

130) Question was, I asked you about support or lack of that you are or are not receiving and you answered "I don't think I would ever have come this far without the support I have received from friends and family."

And coaches.

131) And coaches O.K. How was support demonstrated by family and friends?

They would tell me _____ you need to go work out and you need to get better because we're just not having fun without you.

132) O.K. that's good. What is your opinion of you coaches support after your injury?

Well my coaches were really protective at first, saying _____ you can't do this, you can't do that. But after a while they said _____ you need to start getting ready because you're going to be back pretty soon. At the top of the course once I was just skiing around, I wasn't allowed to race yet and I said _____ can I go and race. He said nope. She said Please. He said O.K. but you can't go in and tuck. And so I got to race actually in the gates but not really.

133) Was it a G.S. (giant slalom)

It was G.S.

134) Yea they're a little wider.

No I wouldn't go if it was slalom or something.

135) Did they contact you while you were in the hospital?

Uh huh (yes). _____ would come work out with me

136) Oh they'd come work out with you. At the rehab center.

No at the gym, _____ would come with me and work out.

137) Oh nice. Was that after your rehab sessions with your therapist?

Uh huh (yes)

138) Between your rehabilitation sessions and when you got back on the snow?

I was working out during my rehabilitation.

139) Oh you were going to the gym as well.

Uh huh (yes)

140) And they were going to the gym with you. That's great. How did your ski buddies keep in touch while you were recovering?

I would go up to the ski foundation and I'd talk and see how they were racing and we'd do stuff.

141) And you'd go up with you sister probably, right when she'd have to go and see everybody.

Yea and I worked for a little while up at _____ so I'd kinda see and then I'd see them a lot cause they would be over at my house a lot.

142) Do you think if you had a sister who was participating in the same program, the same ski program do you think you would have kept in touch with everybody as easily? (side note - meant to say, a sister who was not participating)

Uh huh (yes)

143) Is there anything else that you would like to add about your injury and rehabilitation experience that we didn't cover?

No, we covered everything.

144) Now we are going to go to our imagery session. I didn't know I would have to report on this so I didn't take any notes of what we went through and I do have a pretty good memory. But I want to be sure that I get everything. If you remember something than that must be important. And maybe you'll remember something that I don't, so I don't want to forget anything. Can you tell me to the best of your recollection what we talked about?

We talked about how to stop thinking about something. I do that a lot now. We talked about seeing things in our mind and how we can fix it in our mind like change things.

145) Stop the thought, go back.

And change the way

146) And change the way you're performing, the performance. So you perform positively.

Uh huh (yes) and I do that too. And then you talked about (she was struggling)

147) We saw the video and from the video we started talking about feeling, feeling your body move.

Yea

148) Then we went through those exercises, where you saw the orange dot.

I didn't understand that.

149) Oh you didn't, you didn't understand it very well.

I could do it but I didn't understand why we were doing it.

150) Oh, O.K. that's a good point. Actually we did it so you would get used to using imagery.

Oh O.K.

151) That was external imagery, because you were looking at something and you're controlling it, so that's to give you control of your external image. Images that you're having. Because you start out with a black circle or orange, I don't remember it right now. And then the others, how about the ice tea or the pitcher of fruit punch on the counter and we put ice into it and we stuck our finger in it. You don't remember that one?

I remember that one but I don't remember the other one though.

152) The fruit punch?

I remember that one.

153) And how about when we went through skiing

Uh huh (yes)

154) And we felt, trying to use our muscles, to feel ourselves skiing.

Uh huh (yes)

155) Yes good. And stop thought, I can't think of anything else other than those things that we did, can you?

No

156) Getting to the home stretch. What is your opinion of our imagery meeting?

It helped a lot.

157) It helped a lot. How did it help?

Like, I can control what I think now I don't just let my thoughts wonder I can stop what I'm thinking and change the way I think.

158) What is your opinion of the video that we watched?

Well it helped me understand like what you were trying to explain to me better.

159) O.K. seeing that first.

Uh huh (yes)

160) Was there any part of that video that confused you?

The synchronized swimming part.

161) The synchronized swimming part. How did that confuse you?

I don't understand what it was about.

162) Oh, when she was using her words to get them to do, like the elevator door closing.

I just didn't figure out what she was talking about but that's O.K.

163) What her point was.

Uh huh (yes)

164) How about the imagery exercises?

Those worked.

165) Those worked. Did it help you understand parts of imagery better?

(side note - I did not hear a response here so I'm assuming she nodded yes or I would not have gone on to the next question)

166) Did any part of those three exercises that we did, did any part of that confuse you?

No

167) No O.K. When I lead you imaging yourself skiing what was you opinion of that?

It helped a lot cause my image of skiing was usually like I didn't imagine myself really skiing anymore but where I crashed. That was my only thought, where I was skiing and usually. Good thing I passed out before I hit because I can't remember how bad it hurt when I crashed or not. I just remember, I just think about how I was in the air and then I come down and everything went blank.

168) O.K. that's what you would image when you were having those thoughts of reinjury?

Uh huh (yes)

169) Is that what would come to mind, the pain

The falling and then going blank and then waking up and feeling so much pain and then my friend having to come over and help me get out of my skis and into the toboggan and calm me down.

170) Was there any part of my leading you through imaging yourself skiing that confused you?

No

171) What would you change about our meeting? Now this is when it's O.K. to be critical, well it's O.K. to be critical throughout it but.

If there was any other way to change it I don't think I would know any other way to change it

172) Because you don't know any better?

Yea because I don't know any better.

173) Well that's fair. Maybe the part of the synchronized swimming?

Yea, you could add a little more, non-confusing. I don't know how to explain what she was saying because I don't understand it.

174) You didn't understand what she was trying to demonstrate when she used those key words they didn't mean. Like she would use imagine, I just remember the steel door closing or an elevator closing and you couldn't get that with the movements they were trying to. Her key words weren't words that you would associate with the movements that they were trying to perform.

Oh, I get it now. You don't have to change it now.

175) O.K. but that's good to know that I should ask if there was any part of that that was confusing and bring up that one. What do you know now that you didn't know before the imagery meeting?

I know how to imagine good thoughts. I can change my thoughts to good things.

176) Anything else?

Um huh (no)

177) How about the different components of imagery? Did you know the external, seeing yourself as a video, you know like your watching a video. Did you know that before?

Uh huh (yes)

178) Opposed to seeing yourself through yourself like you explained. Yes you did know that because you explained that to me, when you watching yourself skiing. How about your senses?

Uh huh (yes) I knew that.

179) How about color?

I can see the gates, the snow, and the people. I can see my coaches.

(side note - the taped stopped and a new tape inserted at this point)

180) Did you use performance imagery during your rehabilitation before we met?

Well, the imagery of going through the course and seeing myself but I didn't use the imagery of stopping my thoughts.

181) Just the image of your fall?

Uh huh (yes)

182) Did you use performance imagery after we met?

Uh huh (yes)

183) How often?

Every time I thought about skiing.

184) Would that be once a day, twice a week?

I think three times a day.

185) When would you use it?

When I was thinking about going to go skiing and how I might fall and how I might feel.

186) O.K. was this maybe in the afternoon, in the morning, before you went to sleep?

Before I go to sleep usually.

187) So that would be at home. Did you find it easier to be lead through the imagery or doing it on your own?

Doing it on my own.

188) Why is that?

Cause I can control my thoughts better when I tell myself to do it and not somebody else telling me I should do it.

189) What would you image?

I image a lot of stuff. Sometime I image cooking but it's usually skiing.

190) Skiing through a course or just free skiing, or everything?

Pretty much everything I can do when I'm free skiing and racing and tucking down open runs and going up chairs.

191) Do you see yourself fall?

No, not usually.

192) Good. How would you see yourself?

In really big bulky clothes.

193) In really big bulky clothes. O.K. Would it be like you were seeing yourself like a video?

No.

194) Like you were seeing through yourself?

Yea. I can see through my eyes kind of.

195) See though your eyes. Would you see the color?

Uh huh (yes)

196) Be able to hear it?

I can see the trees, and hear the snow.

197) And feel?

Uh huh (yes). I feel the ruts.

198) How about your body? Can you feel your body skiing?

Yea, I can feel my muscles getting tired and if I'm holding a tuck really long how my muscles start to burn.

199) That's good. What is your opinion of the effectiveness of positive performance imagery when you skied for the first time?

Uh huh (yes)

200) How effective do think the imagery was for when you skied for the first time?

It was very effective.

201) How was it effective?

Like if I didn't use imagery I'd probably be scared so bad that I wouldn't want to do it. And when I came back with my injury I was so excited and I knew I could do it.

202) Why did you feel that you could do it?

Cause, I practiced it so much in my head before I did it I was ready to go back up. I just felt like I just skied yesterday or the day before.

203) O.K. good. Did it relax you to your first experience?

Yes because if I didn't use imagery I would be thinking about oh my gosh its been so long since I skied I probably won't be able to do it, I probably can't. I'd ski the way I used to but with imagery I'd see myself skiing the way I used to and how I improved. With imagery I can improve the way I was skiing. Like if something I needed to work on I could see it in my mind, one the things I needed to work on, its just like skiing. And I would do that so much that I would feel like I was doing it and when I actually went skiing it felt the exact same way.

204) Good. Do you think that helped with your focus?

Uh huh (yes)

205) In your opinion, what is not effective about imagery, ah, positive performance imagery?

All imagery is good, I don't think there is bad imagery unless you're thinking of bad things.

206) Was there any difference in how you felt about getting back on skis after this injury compared to your tibia injury?

When I went back skiing after my tibia I was thinking that its been so long since I skied it's going to hurt really bad if I fall. I don't know how to ski anymore, I'm gonna have to teach myself how to ski all over again. And this time I was confident that I knew how to ski and I could move the way I used to.

207) Do you think that was more in relation to the fact that you were injured before so you knew you that would be able to come back?

Yea it helped because when I got back from my tibia injury I found out that I could do it, but like some times I didn't believe I could but once I actually did I knew I could so when I came back from my dislocation of the hip I knew that I could do it no matter what.

208) Because you had that previous experience?

Uh huh (yes) I'd been through it before.

209) Did the use of imagery, I think I asked you if you used imagery during your rehabilitation process with your tibia fracture and you said no.

Uh huh (yes).

210) So do you think when you used imagery this time, with your hip dislocation, do you think that helped as well as your previous experience with an injury?

Yes.

211) What did you think about when you skied for the first time after your hip dislocation?

I thought about how good it felt to be back skiing.

212) If you were to rate your first skiing experience on a scale from 1 to 5 for nervousness, 1 meaning no nervousness, 5 meaning a lot of nervousness. How would you rate your first skiing experience?

2 1/2.

213) 2 1/2. Now the day before you said that with your tibia fracture you rated that a 4.

Because I was nervous.

214) How about the day before you knew you going back skiing with your hip dislocation?

I was really excited, not really much nervous but excited.

215) And how would rate your nervousness on the scale from 1 to 5 the day before?

3

216) 3 but on the day of you were a 2.5.

Uh huh (yes)

217) O.K. I just wanted to be sure. Were you nervous driving up to Heavenly your first day?

More excited.

218) How about putting on your ski boots?

Then I got kinda nervous.

219) Can you rate that on that nervousness scale 1 - 5?

3.

220) And how about clicking in on your bindings?

That felt really good.

221) So how would you rate that from 1 - 5?

1.

222) Was there any part of the experience that was more difficult than the rest of your first skiing experience?

It was all the same.

223) So you're just excited period. O.K. O.K. When are you planning on skiing again?

Monday.

224) You're going to New Zealand, right?

Well not Monday but maybe Wednesday because it takes a couple days to get there.

225) Are you planning on doing to get ready for this experience?

Well this week my Dad said you have to go to the gym every day, you have to go running, you have to work out really hard because I have to get my muscles ready. Cause I need to be ready. Cause if I get there and I hadn't worked out I'd be totally shocked and the strength that you need cause I've been so lazy after I got done skiing this year.

226) Were you playing soccer this year?

Uh huh (yes)

227) So even though you're playing soccer and you are doing everything else five days a week you consider yourself lazy?

Yea. Because during skiing like I feel so much more work, I feel so much more tired when I come home from skiing than in soccer.

228) Do you plan of using imagery to prepare for skiing again?

Uh huh (yes)

229) When do plan on beginning?

I do it now.

230) Good. How often are you using it now?

Every time I think about skiing I've been imaging how I'm going to do it and that's probably twice a day.

231) What are you imaging?

I'm imaging the way I ski, the techniques I use, the sounds, my coach telling me what I need to do as I'm doing it and fixing it as I go.

232) Do you like using imagery?

Uh huh (yes) It helps a lot.

233) Because, why, how?

I don't know if I didn't use imagery I'd not be able to go back. I wouldn't be able to go skiing and then actually do it cause I would actually have to think about it then. With imagery you think about beforehand so when you're actually skiing you know it, you're expecting it.

234) Do you think it helps to relax you to the experience?
Uh huh (yes)
235) Does it help you get focused?
Yea
236) Does imagery make you feel better or worse?
Better?
237) How does it make you feel better?
It makes me feel more confident when I do it.
238) Would you recommend this program to friends who are injured?
I'd recommend it to people who aren't even injured.
239) Oh you would, oh O.K. Why is that?
Because even if you are not injured people still have the thought of getting hurt and what would happen. If you have imagery you don't even have to think about injury you just think about what you need to do and how you're going to fix it. I think what helps a lot is in ski camp they video tape what we do and then that night they tell us this is what you need to work on and then they point out what you're doing, they make sure you understand, and then that night you really think about it before you go to sleep.
240) Do they mention using imagery that night or do they just say this is...
This is what you're doing, this is what you need to work on and then they tell you to think about it. They tell you to think about the way that you're doing it so the next day when you need to work on it you know what you're suppose to do because you can see it.
241) How do you think this interview went?
Very well
242) Were you board with the questions?
No
243) Do you think there was a lot of repetitive questions?
Yea
244) Was there anything that I could have done better with this interview, improve on?
I don't think so.

That's it, thank you very much.

APPENDIX K

ADDITIONAL INTERVIEW QUESTIONS AND ANSWERS

1) How long was the recovery period, from tibia fracture to first skiing experience?

January to December (11 months)

2) What was the treatment for your tibia fracture?

Closed reduction and physical therapy

3) Were there any differences between the two rehabilitation's?

Not really, pretty much the same

4) If you used positive performance imagery during your tibia fracture rehabilitation do you think it would have affected your first skiing experience?

Yes.

5) How so?

Probably wouldn't have been so scared to get back on skis again.

6) What do you think was more influential, was it the fact that you had been injured again so you knew what it was going to be like or do you think the imagery really helped?

The imagery helped a lot.

7) Can you remember any thoughts of reinjury during your tibia rehabilitation?

Yes

8) How often?

Not often, only when I didn't have other things to think about.

9) When (right after, right before skiing, all through, or other)

Right after and right before I went back skiing.

10) How did it go in New Zealand?

It went very well but I had to go to the Doctor when I came home.

11) Why did you have to go back to the Doctor?

It bothered me.

12) It bothered you, you had some irritation in your hip?

Yes.

13) But your skiing went well?

Yes

Oh good.

14) Rate how nervous you were getting into a race course again from 1 to 5, 1 meaning not very nervous to 5 meaning very nervous?

2. I was a lot more comfortable this time.

15) Do you time yourself when you image going through a race course?

No, I just see myself going through it.

16) What is your opinion of your performance the first time back skiing after the tibia fracture?

I didn't do that well, I was tentative, I was really cautious, going really slow.

17) After the hip dislocation?

It was like I was skiing yesterday.

18) What do you attribute that to?

I attribute it to imagery.

19) How were you ranked compared to other female competitors in your age group?

3rd overall before hip dislocation

14th overall before tibia fracture.

20) So, you improved?

By a lot.

21) Between age 10 and age 14 your skiing ability has improved a lot?

Yes

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