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I am submitting herewith a dissertation written by Jason S. Grindstaff entitled “Development and Validation of the Deaf Athletic Coping Skills Inventory.” I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Sport Studies.

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Development and Validation of the Deaf Athletic Coping Skills Inventory

A Dissertation

Presented for the

Doctor of Philosophy

Degree

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Jason S. Grindstaff

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DEDICATION

Without family, friends and faculty this dissertation would not have been possible. My family always supports and encourages me to pursue the path that allows me to grow as a person. My friends give me perspective on my life in a way that balances my career goals with leisure and enjoyment. The faculty at the University of Tennessee provided an opportunity and mentored me as I pursued my doctoral studies in an amazing graduate program. My appreciation and gratitude is extended to each of you. Thank you so very much for the meaning you continue to bring to my life.

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ABSTRACT

Athletes who are deaf form a unique cultural group within sport. Many have competed at the highest levels of competition from the Deaflympics to professional sport and the Olympic Games. Although deaf athletes have competed at these elite, world-class levels, there have been few attempts to recognize and understand the psychological characteristics of persons who are deaf in the sport context. Therefore, the purpose of the present research was to translate a commonly used inventory for measuring psychological coping in sport – the Athletic Coping Skills Inventory-28 (ACSI-28) - for use with a group of world-class deaf athletes at the 2007 Winter Deaflympics. In order to achieve this objective the study was divided into three stages: (a) adaptation and translation of the ACSI-28 for use with deaf athletes; (b) investigation of the preliminary psychometric properties of the adapted and translated inventory through pilot testing, and (c) collection of data from a group of world-class deaf athletes in order to describe the types of coping skills used in deaf sport and to further extend the initial psychometric properties of the inventory. Results of the pilot study indicated there was initial reliability and validity to warrant the use of this new measure – the Deaf Athletic Coping Skills Inventory (DACSI-36) - in the main study. Subsequent data collection using the DACSI-36 revealed that deaf athletes in some sports used various coping skills significantly more often than athletes in other sports. The results are discussed in light of previous research and implications for future research are presented.

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CHAPTER I

INTRODUCTION

My first day of work as a Recreational Specialist was about as uncomfortable and unforgettable as anything I had experienced in my life. When I arrived at the security gate my supervisor was eagerly waiting for me. Although he had a pleasant smile on his face I'm sure any attempt to say something on my part would have been in vain considering my mouth was bone dry and my hands were trembling. I had no idea what to expect as I reached out to shake his hand. You see, my supervisor and I did not even speak the same language. As a matter of fact, his preferred language is technically not even a spoken language. Profoundly deaf from a young age, my supervisor, David, used American Sign Language (ASL) to communicate. In addition, my experience with ASL was limited to a four-week college course I had completed two months prior. Awkwardly and slowly I signed, "Nice to meet you." His smile grew bigger as he responded, "It's nice to meet you, too." My ASL - for a lack of a better term - was quite awful and I was surprised I ever made it through that first day of work.

Two years later the opportunity to pursue my Ph.D. degree at the University of Tennessee meant I had to resign my position at Tennessee School for the Deaf (TSD). When I broke the news to David we both shed tears and discussed what the past two years had meant to each of us. I loved my job and David enjoyed having me as an employee so the decision to leave was bittersweet. His eyes lit up and I cracked a smile as he told me how proud he was to have seen my signing skills exponentially improve over two short years. For me those two years opened my eyes to a different worldview and changed my life for the better.

My experiences at TSD sparked my interest in deaf sport. The opportunities presented to me during my doctoral studies have prompted this dissertation research. As a student of sport psychology I am interested in better understanding how sport psychology concepts and techniques can be applied to athletes who are deaf. Given the language barrier there is a paucity of research that intersects deaf sport and sport psychology. There is a need to fill in the research gap by addressing some of the challenges and barriers associated with athletes who are deaf. This is an area of sport I am particularly passionate about and I hope this study can be a meaningful contribution to the field of sport psychology and to the Deaf¹ (see comment on p. 101) community.

Purpose of the Study

The purpose of the present study was to explore and describe the types of coping skills used by a group of world-class athletes who are deaf. To obtain this information I adapted and translated the Athletic Coping Skills Inventory (ACSI-28) (Smith, Schutz, Smoll, & Ptacek, 1995) and developed a new measure - the Deaf Athletic Coping Skills Inventory-36 (DACSI-36).

Significance of the Study

Much of what is understood in the field of sport psychology has been obtained through the study of able-bodied athletes. There is a small but growing body of literature in sport psychology addressing athletes with disabilities (Clark & Sachs, 1991; Henschen, Horvat, & Roswal, 1992; Hutzler, 1992; Kirby, 1995; Martin & Mushett, 1997; Watanabe, Cooper, Vose, Baldini, & Robertson, 1992) (See Appendix A for a full review of literature). However, only one research study has attempted to address how deaf

¹ The term “Deaf” with a capital “D” is used in association with various socio-cultural aspects of the being deaf (i.e., Deaf community, Deaf culture).

athletes use mental skills (Clark & Sachs, 1991). Given a number of methodological concerns in previous research and little empirical work conducted in recent years there is a need to investigate the types of mental skills used by athletes who are deaf.

In this research project I utilized a group of deaf adults, certified interpreters and interpreters-in-training to help adapt, translate and digitally record an American Sign Language (ASL) version of the ACSI-28. My primary objective was to provide descriptive information regarding coping skills usage in deaf sport. A secondary objective of this study was to expose a group of athletes to sport psychology concepts in a way that could be personally meaningful for them.

Limitations of the Study

The following limitations apply to this study:

1. The results are limited to elite athletes who are deaf.
2. Given the specificity of participants, results of this study should not be generalized to other groups of deaf athletes (e.g., young and adolescent athletes who are deaf).
3. Results from the present study are descriptive in nature and do not represent an intervention or demonstrate causal effects.

Delimitations of the Study

1. Only persons with a hearing loss of 55dB or greater in the better ear were eligible for full participation in this study.
2. Only athletes competing in one of the five Winter Deaflympic sports were eligible to participate in the present research.

3. Only American athletes competing at the 2007 Winter Deaflympics participated in the study.

Assumptions

The following represented underlying assumptions of this study:

1. It was possible to measure coping skills with a formal sport psychological inventory.
2. The translation of the ACSI-28 presented conceptual accuracy of the instrument and represents cultural equivalence.
3. The translated version of the ACSI-28 (i.e., the DACSI-36) was a valid and reliable means of assessing coping skills in deaf athletes.
4. Participants were accurate and honest in their responses to item statements in the DACSI-36.

Definitions of Terms

AMATEUR SPORTS ACT OF 1978 (Public Law 95-606): Act that required the United States Olympic Committee (USOC) “*to encourage and provide assistance to amateur athletic programs and competition for handicapped individuals, including, where feasible, the expansion of meaningful participation by handicapped individuals in programs of athletic competition for able-bodied individuals.*” (Complete Act available via www.usoc.org)

AMERICAN SIGN LANGUAGE (ASL): Language primarily used among individuals who are deaf in the United States and many parts of Canada and uses a system of manual, facial, and other nonverbal characteristics for the purpose of communication.

AMERICANS WITH DISABILITY ACT OF 1990: Act that established a clear and comprehensive prohibition of discrimination on the basis of disability (Complete act available via <http://www.dol.gov/esa/regs/statutes/ofccp/ada.htm>).

ATHLETE: A male or female participant in one of the five sports sponsored by the USA Deaf Sports Federation (USADSF).

BACK TRANSLATION: A step during the translation process where a translated draft is translated back into its original source language by an individual or group fluent in both languages.

COPING SKILLS: The process of managing demands that are appraised as taxing or exceeding the individual's resources (Seaward, 2004).

CROSS-CULTURAL TRANSLATION: Translation intended for use across cultural groups.

CROSS-LANGUAGE POPULATION: A target group with a primary language other than the original source language.

CULTURE: The grounded terrain of practices, representations, languages, and customs of any specific historical society (Hall, 1996).

DEAF: The use of the word "Deaf" with a capital D represents affiliation with the Deaf community or Deaf culture.

DEAFLYMPICS: Sporting games sanctioned by the International Olympic Committee. The IOC has a need for a separate Olympic games due to the deaf athletes' special communication needs on the sports fields as well as in the social interaction that is a vital part of their culture.

DISABILITY: “The impact of impairment upon the performance of activities commonly accepted as the basic element of everyday living.” (Thomas, 1982, p. 6)

FORWARD TRANSLATION: A procedure used to translate from a source language to a target language by an individual or group fluent in both languages.

IMPAIRMENT: “Any loss of psychology, physiological or anatomical structure or function.” (Bury, 1979, p. 36)

INTERNATIONAL COMMITTEE OF SPORTS FOR THE DEAF: The international group devoted to the organization and supervision of the Summer and Winter Deaflympics.

INTERNATIONAL OLYMPIC COMMITTEE: The international group that supervises the organization and completion of the Summer and Winter Olympic Games.

INTERNATIONAL PARALYMPIC COMMITTEE: The international group that supervises the organization and completion of the Summer and Winter Paralympic Games.

INTERPRETATION: The process of adapting a message from a source language, typically during real time, to a target language.

MENTAL/PSYCHOLOGICAL SKILLS: A set of skills used for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and exercise enjoyment (Weinberg & Gould, 2003).

REHABILITATION ACT OF 1973 (Pub. L. 93-112): Federal legislation that authorizes the formula grant programs of vocational rehabilitation, supported employment, independent living, and client assistance. It also authorizes a variety of

training and service discretionary grants administered by the Rehabilitation Services Administration (Complete act available via <http://www.eeoc.gov/policy/rehab.html>).

SOURCE LANGUAGE (sL): The language in which the original message is conveyed (Humphrey & Alcorn, 2001).

TARGET LANGUAGE (tL): The language into which the original message is expressed by the interpreter (Humphrey & Alcorn, 2001).

TRANSLATION: The process of adapting a message from a source language, typically from a written text, to a target language.

USADSF: The United States of America Deaf Sports Federation.

CHAPTER II

ABBREVIATED REVIEW OF LITERATURE

Historically, society has held negative and limiting attitudes towards individuals with disabilities. These commonly held attitudes have perpetuated myths and stereotypes that have inappropriately categorized those with disabilities into groups based upon what it is believed they are incapable of or cannot do on their own. Approximately one out of ten Americans (43 million) have some form of a disability (Americans with Disability Act, 1990). In light of this, societal attitudes are slowly changing. Along with legislative mandates (e.g., Rehabilitation Act of 1973, Amateur Sports Act of 1978, Americans with Disability Act of, 1990), there have been increased opportunities and participation for individuals with disabilities at all levels of sport (DePauw & Gavron, 2005). However, the detrimental effects of labeling have influenced participation rates in sport for the disabled.

As the intersection of sport and disability has expanded so have the accomplishments of those who participate. The International Paralympic Committee (IPC, www.paralympics.org), the International Committee of Sports for the Deaf (CISS, www.deaflympics.com) and the International Olympic Committee (IOC, www.olympic.org) each post world records for a variety of athletic events. Athletes with leg amputations have run the 100-meter dash in 10.72 seconds, less than one second below the current record for able-bodied athletes (9.77 seconds). In fact, the Deaflympic world record in the 100m dash is 10.21 seconds. In the sport of swimming, disabled competitors in the 1500 meter event have posted a world record time (16:29.28) that is just two minutes off the Olympic men's world record (14:34.56). In addition, both men

and women elite wheelchair marathon competitors have completed marathons in less than one hour and 50 minutes; and some men have posted times less than 90 minutes. Outside of Olympic and world competitions athletes with disabilities have competed at the professional levels in football, golf, baseball and other sports. Although some athletes *but not all* with disabilities require modifications (e.g., rule alterations, equipment, classifications), many have achieved outstanding levels of performances.

Currently, there is a wealth of knowledge regarding how able-bodied athletes cope with the physical and mental demands of sport (Gould, Eklund, & Jackson, 1992a, , 1992b; Gould, Finch, & Jackson, 1993; Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999; Gould, Jackson, & Finch, 1993a, , 1993b; Scanlan, Stein, & Ravizza, 1991; Woodman & Hardy, 1998). As a result, (Lazarus, 2000) recently called for additional research into how various subgroups of athletes psychologically cope with the stresses and demands of sport. A review of the existing research reveals little about the types of demands disabled athletes face (see Appendix A for a full review of literature).

The current research project represented an attempt to expand the scholarly research base of sport psychology and disability sport by drawing specific attention to one particular type of disabled sport participants: Athletes who are deaf. In the only study to date that addressed psychological skills in athletes who are deaf, Clark and Sachs (1991) translated the Psychological Skills Inventory for Sport (PSIS) (Mahoney, Gabriel, & Perkins, 1987) and administered it to a group of deaf volleyball players at a national competition. Their results suggested that athletes who are deaf use a variety of psychological skills, including goal setting, imagery and thought stoppage much like the dominant hearing culture athletes. Although this study represented a first attempt to draw

attention to deaf athletes, it failed to demonstrate that the translated version of the PSIS was appropriate for use with athletes who are deaf.

First of all Clark and Sachs (1991) only briefly discussed their translation procedures in the introduction of their study. While they described some of the important linguistic features of ASL and that regional variation occurs within sign language, they neglected to adequately address important methodological steps such as forward and/or back translation procedures (Patrie, 2001; Vallerand & Halliwell, 1983) that would ensuring an accurate cross-cultural translation. A second methodological concern was that the researchers neglected to field-test the new version of the PSIS in order to ensure its validity and reliability. Field testing is a critical step not only for ensuring that an adapted inventory shows adequate psychometric properties but also for obtaining relevant feedback from participants. Even a fluent translator or group of translators might have a difficult time anticipating all of the potential problems and concerns individuals who complete the assessment might encounter (Hambleton & Patsula, 1999). By soliciting respondent feedback, necessary revisions can be made prior to conducting a larger scale study. A final methodological concern with this study was that the original assessment measure, the PSIS, has been shown to have questionable psychometric properties (Chartrand, Jowdy, & Danish, 1992). In light of these limitations, the results of the Clark and Sachs (1991) study should be interpreted with caution.

While the Clark and Sachs (1991) study represented an initial attempt to bridge the gap on the study of deaf sport and sport psychology, little is known about the mental demands of Deaf sport. As discussed previously, Clark and Sachs (1991) provided data that suggests psychological skills are one important aspect of deaf sport participation.

However, there are also other demands that might be unique to this subgroup of athletes (Grindstaff, 2002; Moore & Levitan, 2003; Scheetz, 2001; Stewart, 1986; Stewart, 1991; Stewart, Robinson, McCarthy, 1991) that have yet to be explored in the field of sport psychology.

Being deaf is often viewed as a unique and separate classification of a disability. In fact, many persons who are deaf do not consider themselves disabled. This is often the case because there is a large body of literature and research that gives attention to two opposing orientations to deafness: medical and socio-cultural model (See Appendix A or Scheetz (2001) for a review of these two models). The socio-cultural model brings deaf individuals together in manner that they share unique psychological and social needs as well as seek activities and organizations that promote and maintain the specialized interest of the community (Scheetz, 2001). Deaf sport is one such social institution that brings Deaf people together in a way that acts as a support system, social network, and educational system that promotes the values of the Deaf community (Stewart, 1991). Deaf individuals "...exercise their right to self-determination through organization, competition, and socialization surrounding Deaf Sport" (Stewart, 1991, p.2). Within this context there are a number of psychological and environmental factors that might affect performance of deaf athletes.

The psychological factors that are unique to deaf sport each having the potential to influence performance. These factors include communication, competing values, and intrapersonal pressure to compete (Stewart, 1991). Communication is one of the critical features of the Deaf community. Often, the preferred and primary language of the Deaf is ASL, American Sign Language (Moore & Levitan, 2003). When the deaf athlete

interacts with other deaf athletes there is complete access to communication. However, many Deaf athletes train and compete with hearing athletes due to the difficulty they have finding teams or for the enjoyment of the physical challenge of competing with hearing athletes (Stewart, 1991). When this is the case there can be a communication gap, resulting in a great deal of frustration and anxiety. At times, the deaf athlete may feel uncertain as to what is going on because s/he does not have complete access to instructions and feedback as do the other hearing athletes. When communication is limited a barrier exists that prevents the deaf athlete from participating in the same manner as hearing athletes.

A second psychological factor with the potential to influence performance is competing values. The Deaf community and the hearing world often have different value systems (Stewart, 1991). For example, one of the unique values found in the Deaf community is an emphasis on educational background. There is a great deal of pride associated with attending a residential school for the deaf as compared to public schools (Scheetz, 2001; Stewart, 1986). When a deaf student attends a residential school for the deaf s/he is allowed to realign his/her social behaviors in a manner that conforms to what might be expected in the Deaf community. The deaf student who competes in a sport through his/her residential school for the deaf feels a great sense of Deaf pride and commitment for his/her team that goes beyond school spirit. It is a value that is deeply ingrained in the Deaf community and one that individuals with a hearing perspective find difficult to completely understand. Other values emphasized within the Deaf community include resentment of negative interference of the hearing culture, strong support system

for other deaf individuals, intrinsic motivation to promote Deaf culture, and the autonomy to control their own lives separate from hearing dogmatism (Stewart, 1991).

Another psychological factor that has the potential to influence performance in deaf sport is the pressure to compete (Stewart, 1991). Being deaf is a low-incidence disability and as a result the Deaf community represents a finite number of individuals. The availability of deaf sport participants for any given sport is limited, especially when considering factors such as sport interest, travel time, schedule conflicts and other commitments. As a result, Stewart (1991) believes that some deaf players might feel pressured to compete due to limited numbers in the Deaf community.

The social and organizational climates of the Deaf community present a variety of demands for individuals competing in Deaf sport. Some of the factors that influence the social climate include the home environment, socialization processes, and pressure to assimilate. The home environment is an important aspect of being deaf because the “...social behavior of Deaf individuals, in part, reflects their adjustment to deafness as well as their response to the psychological forces they face in society” (Stewart, 1991, p. 46). Approximately 90% of deaf children are born to hearing parents (Scheetz, 2001) so there is usually a communication gap between the hearing parents and the deaf child. How parents reacts to their child being deaf varies (e.g. denial, anger, resentment, guilt, turning toward religious affiliations, projecting blame, positive outlook toward the future) and influences not only the parent-child interaction but eventually the development of the child (Vernon & Andrews, 1990). Communication is often impacted the most when hearing parents have negative reactions to the deafness of their child (Stewart, 1991). As Stewart (1991) suggests, “The extent to which hearing parents are able to instill a set of

mores and beliefs in their deaf child is likely below that which can be of deaf parents of deaf children or hearing parents of hearing children” (p. 51). For some deaf individuals who lack sufficient communication skills sport might be especially demanding because of their inability to expressively convey and receive information (Stewart, 1991). However, as the deaf child develops and acquires language through acculturation in the Deaf community sport can become a relaxing environment where s/he can more comfortably express concerns.

The socialization process in sport is another concern for deaf sport participants. There is evidence to suggest that Deaf athletes enjoy competing in and against hearing teams due to the challenge (Stewart, Robinson, McCarthy, 1991). However, deaf athletes tend to prefer training with other deaf athletes due their ability to communicate before, during, and after practice sessions. As a result, Stewart and colleagues (1991) point out that deaf athletes must consider and balance their desire to compete against better competition with the need to socialize and interact with teammates and coaches.

A third environmental factor that influences deaf sport participation is the pressure to assimilate (Moore & Levitan, 2003). Situations occur when a member of the deaf community branches out and attempts to excel in an area (career, education, sport) that members of the Deaf community feel challenges the status quo and aligns the individual with the hearing world. A deaf individual attempting to compete and excel in hearing sport might feel resentment from his/her peers, adding additional pressure and mental strain to the practice and competition environment. Although pressure to assimilate is not valued by every member of the Deaf community instances do occur.

In addition to social factors in the environment, it is also important to consider the organizational factors that have the potential to affect Deaf athletes' performance. One of the organizational factors hearing athletes do not have to think about on a regular basis is classification rules for participation. Deaf communities often face logistical problems when organizing sports due to limited numbers. As is often the case, classification for what it means to be "deaf" differs at the local, regional, national and international levels. An individual with a slight hearing loss might qualify to compete in local or regional Deaf sport events but may not be permitted to participate national and international competition because s/he does not meet the minimum hearing loss requirements (Stewart, 1991). Membership in deaf sport events and competitions at the elite levels means athletes are brought together based upon their unique communication needs and limited reliance on spoken language (Stewart, 1991).

With this information taken together, the aim of the present study was to extend the original research conducted by Clark and Sachs (1991) by addressing the aforementioned methodological concerns and taking into consideration the unique demands deaf athletes encounter in sport. Using more appropriate methods an instrument was developed and tested on current world-class level athletes who were deaf. Additional item statements were incorporated in order to more adequately address the unique demands deaf athletes encounter in sport. Therefore, the primary aim was to develop a translated version of a valid and reliable coping skills assessment and determine its effectiveness in assessing coping skills in athletes who are deaf. As a result, the information gained from such an inventory could potentially open a window of

opportunity for a group of athletes to explore a variety of sport psychology concepts in the form of coping skills.

CHAPTER III

METHODOLOGY

The primary purpose of the present study was to develop a translated version of a valid and reliable coping skills assessment and determine its effectiveness in assessing coping skills in athletes who are deaf. The study was divided into three stages: (a) adaptation and translation of the ASCI-28 (Smith, Schutz, Smoll, & Ptacek, 1995) (See Appendix B) for use with deaf athletes; (b) investigation of the preliminary psychometric properties of the adapted and translated inventory through pilot testing; and (c) collection of data from a group of elite deaf athletes in order to further verify and extend the initial psychometric properties of the inventory. During the first stage a 14-step adaptation and translation process (Patrie, 2001; Vallerand & Halliwell, 1983) was meticulously followed in order to develop a new measure - the Deaf Athletic Coping Skills Inventory-32 (DASCI-32). The second stage further addressed the initial purpose statement and was designed to preliminarily validate the new ASL video version of the DASCI-32. The DASCI-32 was given to a group of former deaf athletes and interpreters similar in age of those to be solicited for participation in the main study. It was deemed important to establish parallel form reliability between the English version (see Appendix C) and ASL version (see Appendix D) of the DASCI-32 so that during the main study deaf athletes would have the option of taking either version. During the third stage, the adapted and translated DASCI-32 was administered to a group of world-class deaf athletes at the 2007 Winter Deaflympics held in Salt Lake City, Utah. Prior to conducting the pilot and main studies, approval was obtained from the University of Tennessee internal review board (IRB) (See Appendices B, E & I). Each stage is discussed more fully in the following

sections.

Stage 1: Adaptation & Translation

The procedures adhered to in this stage of the study included a 14-step process outlined by Patrie (2001) and discussed in previous research (Vallerand & Halliwell, 1983). The steps included: (1) analyze the text, (2) find the main idea of the entire text, (3) find the main idea of each item, (4) identify specific translation issues, (5) transfer, (6) reformulate, (7) create a draft, (8) review and revise, (9) translate the title, (10) test the translation, (11) determine impact of source text, (12) peer review, (13) back translation, and (14) consider risk of error and loss.

During Step 1 - analyze the text - the translator becomes familiar with the nature and flow of the text. In this case, I read through the entire ACSI-28 numerous times to become familiar with the layout, sentence structure and response requirements. Step 2 - find the main idea of the entire text - was guided by previous literature on ACSI-28. The main idea or purpose of the ACSI-28 is to identify various types of coping skills athletes use in sport. As an extension of previous steps, Step 3- find the main idea of each item – involves identifying the seven sub-factors (e.g., coachability, goal setting, confidence and achievement motivation). Knowing the main idea or purpose of each item statement allowed me to begin targeting specific translation issues in Step 4. Translation issues included difficult vocabulary, passive voice statements, unequivocal meaning between languages and ambiguity in original item statements (Patrie, 2001; Vallerand & Halliwell, 1983). For example, item #12 states, “I don’t have to be pushed hard to practice or play hard; I give 100%” is problematic because it is worded in a passive voice. Passive voice statements present potentially troublesome translation issues for

translators because without knowing who the agent is that is producing the action (i.e., *who is pushing the athlete?*) an acceptable translation is difficult to obtain.

The previous step required considerable attention because during Steps 5 and 6, I began to transfer and reformulate the source language text (English) to the target language (ASL). During these steps I utilized the help of a group of certified interpreters (n= 3), interpreters-in-training (n= 5) and deaf individuals (n= 2) in order to sign each item statement. Each volunteer was given four to six inventory statements to translate on his/her own, while one deaf individual volunteered to sign all 32 item statements. Once each volunteer felt comfortable with the group of item statements s/he was video-recorded signing each statement separately. With 10 volunteers and 32 item statements the total result was a pool of translations that could be compared for translation accuracy, signing style and cultural equivalence. Taken together the pooled translations formed the basis for one deaf former athlete and member of the deaf community to sign each of the item statements in Step 7, a draft was created. During the review and revision stage (Step 8) a considerable amount of time was spent processing the raw digital video material and revising it into a format that could be tested with a group of interpreters and members of the deaf community. Once the video material had been edited a suitable title was adapted (Step 9) from the original ASCI-28 - Survey of Deaf Athletic Experience - and a working copy of the digital video was burned to a DVD for ease of administration during the pilot testing.

With a DVD ready for use I proceeded to complete the next three steps: test the translation (Step 10), determine impact of source text (Step 11) and peer review (Step 12). During these three steps a group of certified interpreters (n= 3) and staff interpreters

(n= 2) from Knoxville Center for the Deaf, a local resource center and interpreting service provider for the deaf, helped facilitate the process. Some of the recommendations made by the interpreters included minor formatting changes to the written and ASL response forms, administering the ASL and written versions in random order, re-editing the video to correct for lighting problem concerns, and potentially shooting the video again due to linguistic and grammatical discrepancies between the source and target languages. The group came to the consensus that the interpreting model, although deaf and fluent in sign language, had a signing style that was influenced by a combination of signed English and ASL in many parts of the translation. A number of the certified interpreters recommended using a signing model who had been raised with deaf parents and grew up in a residential school for the deaf in order to ensure a more accurate translation from English to ASL. The feedback provided by the certified and staff interpreters was taken into account and necessary changes were made in the video translations and response forms.

In line with the feedback and recommendations provided by the certified and staff interpreters a second video translation was conducted. An ASL consultant from a local center for the deaf volunteered his time to help with the translation and perform the interpretation on video. On two separate occasions the consultant and I discussed issues related to the purpose of the inventory and the intent of each item statement in order to clarify meaning. After the consultant felt comfortable with the inventory and achieved a sufficient translation for each item statement the video was produced. The digital-video material was again edited and formatted to DVD in order to proceed to the final two steps. A small group of certified interpreters (n=2) and a staff interpreter (n= 1) from the

University of Tennessee offered their time to help with the back-translation (Step 13).

During back-translation the interpreters watched each item statement separately in its entirety and then immediately voiced an initial interpretation. Once each interpreter offered her version of an interpretation all three interpreters watched the item statement together and achieved group consensus of the interpretation.

The final step of the translation process - consider risk of error and loss - was an important procedural step because although complete 100% error free equivalence between two languages was the goal it is often unobtainable (Patrie, 2001; Vallerand & Halliwell, 1983). Differences in language structures and cultural experiences make this step a difficult one. With this in mind, the goal was to achieve a translation that had cultural equivalence and minimized error through inaccuracy or loss of meaning.

Stage 2: Pilot Study

Participants. The 21 participants included in this pilot study consisted of certified interpreters [Registry of Interpreters for the Deaf (RID), National Association of the Deaf (NAD)] (n= 10) and former athletes who were deaf (n= 11). The mean age of the sample was 37.7 years (SD= 13.2, range= 21-62 years). The gender breakdown was 62% male and 38% female. Each individual agreed to voluntarily participate in the pilot study and signed an informed consent form (see Appendix F). All certified interpreters were fluent in both English and ASL and, therefore, were able to complete both the translated videotaped ASL version of the DASI-28 and the standard written English version. Deaf participants fluent in both languages also completed both versions of the assessment. However, those deaf participants (n= 3) that self-reported not feeling comfortable with English were asked to only complete the ASL video version of the assessment. Each

participant was asked to sign an informed consent form and was reminded s/he would be allowed to withdraw from the research at any time during the process. Data collected from these participants was used to help determine the psychometric characteristics of the DACSI-36.

Instrumentation. The Athletic Coping Skills Inventory-28 (ACSI-28) (R. E. Smith, Schutz, Smoll, & Ptacek, 1995) was developed to measure a variety of ways athletes cope with the stresses and pressures of competition (see Appendix B). When the inventory is administered to athletes the title “Survey of Athletic Experiences” replaces the formal instrument title. The 28-item responses are answered on a 4-point Likert scale ranging from 0=*almost never* to 3=*almost always*. Responses to the 28 items yield a total Personal Coping Resources score, which is believed to encompass a variety of psychological skills. For the purpose of this pilot study, a 5-point Likert scale was used in order to allow athletes the option of a neutral response (i.e., *sometimes*); the title was also adapted to “Survey of Deaf Athletic Experience.” The seven subscales of the ACSI-28 include: *Coping With Adversity, Peaking Under Pressure, Goal Setting/Mental Preparation, Concentration, Freedom From Worry, Confidence and Achievement Motivation, and Coachability*. In an adapted rating form for baseball coaches, Smith & Christensen (R.E. Smith & Christensen, 1995b) defined the seven ACSI-28 subscales as follows (p. 402):

- *Peaking Under Pressure:* Is challenged rather than threatened by pressure situations and performs well under pressure; a clutch performer.
- *Freedom From Worry:* Does not put pressure on himself by worrying about performing poorly or making mistakes; does not worry about what others will

think if he performs poorly.

- *Coping With Adversity*: Remains positive and enthusiastic even when things are going badly; remains calm and controlled; can quickly bounce back from mistakes and setbacks.
- *Concentration*: Not easily distracted; able to focus on the task at hand in both practice and game situations, even when adverse or unexpected situations occur.
- *Goal Setting and Mental Preparation*: Sets and works toward specific performance goals; plans and mentally prepares himself for games and clearly has a “game plan” for pitching, hitting, playing hitters, base running, and so on.
- *Confidence and Achievement Motivation*: Is confident and positively motivated; consistently gives 100% during practice and games and works hard to improve his skills.
- *Coachability*: Open to and learns from instruction; accepts constructive criticism without taking it personally and becoming upset (p. 402).

Prior to the present study, the ACSI-28 had not been adapted or translated for use with cross-cultural or cross-language populations. Considering the linguistic and grammatical structure of ASL (Valli & Lucas, 2005) as well as the demands unique to deaf sport (Stewart, 1991) there was a need to adapt and translate the English written version of the ACSI-28 for use with deaf athletes. Adaptations included standard instructions for completing the assessment, demographic questions, and additional item statements. Based up on a review of literature included the eight additional item

statements:

1. I often feel frustrated because of problems communicating with teammates or coaches that do not know ASL.
2. When competing in sport it concerns me if my teammates are hearing.
3. If I excel in a hearing sport I rarely think about what other members of the Deaf community think about me.
4. I feel more confident when I compete in sports with other deaf athletes.
5. If I were to compete on a team with other hearing athletes I feel like my deaf friends would support me.
6. It would bother me to play on a team with mostly all hearing athletes.
7. I rarely have problems communicating with teammates and coaches that do not sign.
8. I feel a great sense of pride when I compete in deaf sport.

The translation process involved both backward and forward translation procedures (Vallerand & Halliwell, 1983) and included recommendations outlined in previous research (Geisinger, 1994; Van de Vijver & Hambleton, 1996). The DAsCI-36 was completed with the help of a team of certified interpreters, interpreters-in-training and individuals who were deaf and familiar with sport. The signed version was digitally video-recorded and edited to form a DVD for ease of administration with pilot study participants. A deaf individual who was an active member of the deaf community signed all parts of the final ASL video.

Procedures. Upon organizational approval (see Appendix F) all participants were recruited from a local center of the deaf and local deaf sport teams. Participants met at

the center on one of two separate occasions to complete the assessment(s). A room with minimal auditory and visual distractions was used in order to reduce interruptions. After signing an informed consent form (see Appendix G) participants fluent in both English and ASL completed both the signed and the standard written English version of the DASI-36 in a randomized order. Participants who self-reported not being fluent in English were asked to complete only the DASI-36 video version. All responses to both versions of the DASI-36 were recorded on paper and collected by the researcher upon completion.

Data analysis. All data analysis was conducted using SPSS software (version 14.0, SPSS Inc, Chicago, IL) and was carried out in three stages. First, descriptive statistics (e.g., mean, standard deviation, distribution) were calculated in order to better understand the results. Second, in order to address the reliability of the two inventories inter-item correlations coefficients were derived for each of the item statements within the factor components. T-tests were calculated to further determine any mean differences in factor scores between the ASL and English versions. Finally, item-analysis concurrent validity properties were assessed by determining item-deleted coefficient alphas. Concurrent validity was determined by calculating coefficients of correlation for the eight factor scales and total scores, with the parallel scores on the English and ASL versions of the DASI-36.

Stage 3: Olympic Study

Participants. Participants included 36 of the 53 U.S. athletes (68%) competing at the 2007 Winter Deaflympics in Salt Lake City, Utah. The Deaflympics are sponsored by the International Committee of Sports for the Deaf (CISS). Competition was held

from February 1-10, 2007. Main study participants competed in four of the five sports²: (1) alpine skiing [n= 7], (2) curling [n= 9], (3) ice hockey [n= 15] and (4) snowboard [n=5]. The mean age of athletes participating in this study was 29.4 years (SD= 9.5, range= 18-60 years). Prior to participation, each athlete was asked to sign an informed consent form (see Appendix G), which assured that responses would: a) remain confidential, b) only be used for research purposes,, and c) only be seen by coaches or committee board members in an aggregate form.

Instrumentation. The translated measure used in the Olympic study was the same one used in the initial pilot study (see Appendices C & D). Given the adequate reliability of the assessment between languages U.S. athletes who volunteered to participate had the option of taking either the written English or the video ASL version of the inventory. The inventory was referred to as the Deaf Athletic Coping Skills Inventory (DACSI-36) and consisted of 36 item statements.

Procedures. Upon obtaining IRB approval from the University of Tennessee (see Appendix E) I contacted the Executive Board associated with the United States of America Deaf Sports Federation (USADSF) via e-mail in order to briefly explain the nature of the study. After soliciting permission from the Executive Board, I attended the 2007 Winter Deaflympics, contacted each of the head coaches to discuss the nature and logistics of the study. After I obtained assent from the coaches to allow their athletes to participate (see Appendix G) the coaches assisted me in setting up an initial meeting with each team so that I could inform the athletes about the nature of the study and their rights as participants. In addition, I discussed how the inventory results would remain

² There are five sports sponsored at the Winter Deaflympics. However, only four sports were sampled because the U.S. only had one representative competing in the cross-country skiing events and there was no head coach to contact upon arrival in Salt Lake City.

confidential and how results would not be used for the purpose of future team selection or playing status. All participants had the opportunity to ask any questions and were asked to sign an informed consent form.

Upon completing the informed consent form each participant determined which version of the assessment s/he would prefer to complete. Of the 36 athletes who completed the DASI-36, nine (25%) chose to complete the ASL video version while 27 (75%) completed the written English version. A separate area was secured so that participants could complete either the adapted written DASI-36 (See Appendix C) or the video version of the DASI-36 (See Appendix D). The assessments were administered in separate quiet rooms with minimal auditory and visual distractions. Athletes who chose to complete the English written version of the DASI-36 did so with other teammates completing the same version. The same procedure was used for athletes completing the video version of the DASI-36.

During group administration, participants were reminded that all information would remain confidential. During a brief introduction in both English and sign language or ASL, participants were explained the procedures and given the opportunity to ask or register concerns. Upon completion of the DASI-36 I collected all materials and asked participants to informally indicate what their experience was like taking the inventories.

Data analysis. Data analysis procedures for the Olympic study were similar to those used during pilot testing. All data analysis was conducted using SPSS software (version 14.0, SPSS Inc, Chicago, IL). Descriptive statistics (e.g., mean, standard deviation, distribution, kurtosis and skewness) were calculated in order to better understand the results. Following the suggestions of Lounsbury and colleagues (2006)

psychometric properties were determined for internal consistency reliability and construct validity. MANOVA was calculated to determine any potential differences in mean scores between the English and ASL versions. Finally, one-way ANOVAs and accompanying post-hoc tests were calculated in order to determine whether significant differences existed between the various groups of athletes on the DACSI-36.

CHAPTER IV

RESULTS AND BRIEF DISCUSSION

The primary aim of the present study was to develop a translated version of a valid and reliable coping skills inventory and then assess its effectiveness in describing the use of coping skills in athletes who are deaf. The study was divided into three stages. Stage 1 involved the adaptation and translation of the Athletic Coping Skills Inventory (ACSI-28) for use with deaf athletes. In line with Smith, Schutz, Smoll, & Ptacek's original research (1995) the new inventory was named the Deaf Athletic Coping Skills Inventory-36 (DACSI-36). When it is administered to deaf athletes it carries the title *Survey of Deaf Athletic Experience*. During Stage 2, the preliminary psychometric properties of the adapted and translated inventory were analyzed through a pilot test using certified interpreters and former deaf athletes. During the final stage, the inventory was administered to a group of world-class deaf athletes in order to further support and extend the initial psychometric properties of the DACSI-36 and to describe the types of coping skills these athletes use during international Deaflympic competition. The results of Stage 2 and 3 are presented in the following sections.

Pilot Study

Individuals who were deaf³ (n= 12) and certified interpreters (n=9) completed both versions of the DAsCI-36 in a randomized order. Table 1 shows the Pearson product moment correlations for a number of demographic variables and pairings between the Personal Coping Resource (PCR) scores along with the eight factors within the ASL versions of the DACSI-36 (see Appendix J for all tables). Table 2 shows the Pearson

³ Twelve members of the Deaf community volunteer to participate in the pilot study. Of the 12 participants nine felt competent in both ASL and English and therefore completed both versions of the inventory.

product moment correlations for similar demographic constructs and pairings between the Personal Coping Resource (PCR) scores along with the eight factors within the English version of the DACSI-36. These results provide early construct validity for both adapted and translated versions of the inventory.

Construct validity. For both the ASL and English versions, the total PCR scores (.62 and .52, respectively; $p < .05$) and the *Confidence* factor scores (.61 and .66, respectively; $p < .05$) were significantly correlated with self-reported performance rating in sport. In other words, individuals with higher perceived abilities in their respective sports tended to have higher total PCR and *Confidence* scores. The self-reported performance rating in sport accounted for up to 38 percent of the variance ($r = .62$, $r^2 = .38$) in total PCR scores while accounting for up to 44 percent of the variance ($r = .66$, $r^2 = .44$) in *Confidence* scores.

Similar to the original ACSI-28, the current DACSI-36 yielded a PCR total score that was “assumed to reflect a multifaceted psychological skills construct” (Smith, Schutz, Smoll & Ptacek, 1995, p. 379). Previous researchers have suggested that confidence is one of the critical factors that has been shown to distinguish highly successful athletes from those who are less successful (Gould, Greenleaf, Lauer, & Chung, 1999; Jones & Hardy, 1990). As was the case in the current study, individuals with high perceived ability in sport also had higher Confidence factor scores.

Internal and parallel form reliability. Internal consistency reliability coefficients were determined for each of the Personal Coping Resource (PCR) scores and the factors within the English and ASL versions of the DACSI-36. The Pearson product moment correlation was .91 for the PCR scores and ranged between .69 (*Confidence* &

Achievement Motivation) and .94 (*Goal Setting*) ($p < .01$). Table 3 shows the pairwise correlations between the total PCR scores and the eight factors within each of the two language forms. During the initial stage of scale development it has been recommended that coefficient alphas achieve a level of .75 or higher (Lounsbury, Gibson & Saudargas, 2006). The only factor to not reach this level of reliability was the Confidence and Achievement Motivation factor ($\alpha = .69$, $p < .01$). These results are similar to those reported during the initial development of the ACSI-28 (Smith, Schutz, Smoll, & Ptacek, 1995). The initial alpha levels in the research conducted by Smith and colleagues ranged between .64 to .81 ($p < .01$).

Further analysis of the Confidence and Achievement Motivation factor scale revealed significantly low item-total correlations for one item statement within the scale. Table 4 shows each of the item-total correlations and Cronbach's alphas if the item were deleted. Note that item statement number 12 in the ASL and English versions had significantly low item-total correlations; $\alpha = .03$ & $.20$, respectively. Removal of these two items from the inventory improved the inter-scale correlation to $\alpha = .70$ and the item-total correlations to $\alpha = .77$. While item analysis supported the removal of item number 12 from both scales in order to strengthen the internal reliability and factor validity of both versions of DAsCI-36, I determined I would leave both item statements in the inventory for the Olympic study which involved a larger sample.

Further analysis of the mean differences between individual factors using paired sample t-tests are shown in Table 5. None of the eight factors achieved significance at the $p < .05$ level. Taken together, the high coefficient alphas and non-significant paired sample t-test results suggest that both the ASL and the English versions of the DAsCI-36

have high parallel form reliability (Lounsbury, Gibson, & Saudargas, 2006) and concurrent validity. Thus each participating Deaflympian in the main study was given the opportunity to complete either the ASL or English version.

Olympic Study

While the pilot study addressed the initial psychometric characteristics of the DACSI-36 the Olympic study provided additional psychometric support for the adapted and translated inventory. The primary objective of this study was to address the initial research question, “What types of coping skills do world-class deaf athletes use?” In order to address this question a sample of world-class deaf athletes at the 2007 Winter Deaflympics were solicited to participate in the present study.

Descriptive analysis. Thirty-six (68 percent of all) U.S. Deaflympians at the 2007 Winter Deaflympics in Salt Lake City, Utah participated in this study. Table 6 provides descriptive statistics for each of the DACSI-36 factor scales for these athletes. A number of the scores were negatively skewed, possibly due to the fact these athletes had competed at the highest level of competition for their respective sports within the Deaflympics.

As mentioned previously the Deaflympian participants had the option of completing either the ASL or the English version of the inventory. Nine participants (25 percent) completed the ASL version while 27 (75 percent) completed the English version. When accounting for communication preference (e.g., ASL, signed English, written English, oral English) and inventory preference, chi-square analysis determined a significant difference in communication preference $\chi^2 (1, N=36)=.858, p<.05$. For those Deaflympians whose primary mode of communication was *not* ASL (i.e., signed English,

written English, oral English), none completed the ASL version. Interestingly, individuals who responded that ASL was their primary mode of communication (n=21) not did not complete the ASL version (Stewart, 1991; Stewart, 2003). Nine completed the ASL version while 12 completed the English version. Multivariate analysis of variance (MANOVA) using the means for each of the eight factors and total PCR scores as dependant variables and the ASL and English versions as the independent variables revealed no significant differences (Wilks' Lambda= 1.607, $p>.165$). This result support for the use of a mixed-language methodology when conducting research in the area of deaf sport.

Reliability and validity. The overall reliability for the present 36 item statement inventory (Cronbach's coefficient alpha= .84) was acceptable (Lounsbury et. al., 2007). When item-total reliability was determined for the original 28 item statements in the ACSI-28 the alpha level was .85. These results indicate that at the present time the additional eight item statements on the DACSI-36 do not add significant unique variance to the original ACSI-28. However, it was determined that the factor scales and total coefficient alphas could be raised further by deleting potentially problematic item statements. Table 7 shows that the factor scale Cronbach's coefficient alpha scores ranged from .26 to .83 with the three lowest ($\alpha<.60$) factor scales being Confidence and Achievement Motivation, Concentration and Deaf Sport.

Within the Confidence factor, scale item number 12 had a corrected item-total correlation of .139 and if deleted would raise the Cronbach's alpha from .525 to .588. The Concentration factor scale suggested item number 14 had a rather low corrected item-total correlation of -.048 and if deleted would raise the Cronbach's alpha from .439

to .618. With regard to the Deaf Sport scale it could be argued that reducing the eight item factor to three items (see Table 8) would raise the coefficient alpha to .737. In this case the factor would address how deaf athletes cope with other hearing teammates and communication concerns. The factor would, therefore, be titled “*Deaf Interaction and Communication.*” According to Lounsbury and colleagues (2006) this form of item analysis is one method of increasing factor validity.

Deaflympians use of coping skills. The 36 participants were sampled from four of the five sports at the Deaflympics. The only sport without a single participant in the main study was cross-country skiing. During the 2007 Winter Deaflympics the U.S. only had one representative competing in cross-country skiing. Furthermore, this athlete did not have a coach so I was unable to solicit the participant..

The sports sampled included alpine skiing (n=7), curling (n=9), ice hockey (n=15) and snowboarding (n=5). PCR scores were analyzed for each and ranged from 74 to 143 (maximum score possible of 144). Initial analysis of PCR scores addressed potential differences between males (n=25) and female (n=11) participants in order to describe trends in the use of coping skills. Levene’s test for equality of variance ($F = .024, p = .877$) suggested equal variance between the two groups. Simple t-tests for equality of means ($t = .459, df = 34, p = .649$) did not support differences between gender for total PCR mean scores.

Next, descriptive analysis of the PCR scores based on sport type with mean score, standard error and confidence intervals were analyzed and are described in Table 9. In order to determine if the mean scores were significantly different from one another a one-way analysis of variance (ANOVA) was calculated. Mean PCR scores were not

significantly different between alpine skiing ($\bar{x} = 108.14$), curling ($\bar{x} = 109.44$), ice hockey ($\bar{x} = 112.27$) and snowboarding ($\bar{x} = 106.4$) ($F = 1.003$, $df = 35$, $p < .05$).

Descriptive statistics (i.e., mean, standard deviations) for sport and factor scales are provided in Table 10. Sport group mean scores were highest on the factor scales *Confidence* ($\bar{x} = 3.46$, $\sigma = .45$) and *Coachability* ($\bar{x} = 3.26$, $\sigma = .65$) while reported scores were lowest for *Freedom From Worry* ($\bar{x} = 2.58$, $\sigma = .96$) scale. Total PCR scores were determined to be significant with multivariate analysis which utilized the Wilk's Lambda test ($F = 2.418$, $p > .002$). This finding suggests that significant differences existed between one or more of the factor scales based upon sport type. Further post-hoc analysis revealed significant differences between *Confidence*, *Freedom From Worry* and *Peaking Under Pressure* factor scales for several sports (Table 11). Specifically, the *Confidence* factor scale mean score for the curling athletes ($\bar{x} = 3.66$, $\sigma = .35$) significantly differed from the alpine skiing athletes ($\bar{x} = 3.21$, $\sigma = .17$). The same two sport groups differed significantly on the Freedom From Worry scale; however, alpine skiers had higher mean factor scores ($\bar{x} = 3.29$, $\sigma = .53$) compared to curlers ($\bar{x} = 3.14$, $\sigma = .75$). Furthermore, snowboarding ($\bar{x} = 3.25$, $\sigma = .35$), ice hockey ($\bar{x} = 3.22$, $\sigma = .51$) and curling ($\bar{x} = 3.14$, $\sigma = .75$) groups each had significantly higher mean scores on the Peaking Under Pressure factor scale when compared to the alpine skiing ($\bar{x} = 2.93$, $\sigma = .52$) group.

In the next chapter results of the present study are summarized. Furthermore, results are discussed in-depth and in relation to relevant literature in the field of sport psychology and deaf studies. Recommendations for future research and implications for sport psychology practitioners are offered.

CHAPTER V

IN-DEPTH DISCUSSION AND IMPLICATIONS

Summary

The primary purpose of the present study was to develop a translated version of a valid and reliable coping skills assessment and determine its effectiveness in assessing coping skills in a group of world-class deaf athletes. The three part study met these objectives. It is hoped that the results have significant relevance that extends previous research in the area of psychological aspects of deaf sport participation. Additionally, researchers and practitioners interested in cross-cultural and cross-language assessment may find these results useful. However, the results of the third stage of the study should be interpreted with caution due to limitations of the study and the need for additional testing of the DACSI-36. Implications of each stage of study are discussed herein.

During the stage 1 and 2 the ACSI-28 was adapted, translated and piloted with a group of certified interpreters and former deaf athletes. Results of the pilot test suggested this secondary purpose was achieved considering there was high internal consistency and strong parallel form reliability for the English and ASL versions of the DACSI-36. Construct validity was initially supported by high correlations between PCR scores and self-reported performance rankings. These analysis indicated that the two forms were sufficiently similar and allowed Deaflympian participants the opportunity to complete either the English or ALS version of the inventory. During the 2007 Winter Deaflympics 36 participants volunteered to complete the inventory of their language preference in order to address the primary purpose of the study. Although the sample size was relatively small for scale development (Lounsbury, Gibson, & Saudargas, 2006)

it did, however, consist of 68 percent of the U.S. athletes (N=53) at the 2007 Winter Deaflympics. The results should therefore be considered preliminary in the process of scale development. Nevertheless, they suggested that deaf athletes in specific sports use coping skills to a greater extent compared to deaf athletes in other sports.

Significance of the Study

Given previous psychometric and methodological concerns, the present study represented an attempt to extend the previous research conducted by Clark and Sachs (1991) in two important ways. First, coping skills in deaf sport were assessed through the use of an inventory (ACSI-28) with strong psychometric properties (Smith & Christensen, 1995a; Smith, Schutz, Smoll, & Ptacek, 1995). The newly developed inventory allowed for an opportunity to assess coping skills in a variety of deaf sports. Given that Clark and Sachs (1991) delimited their study to deaf volleyball players competing at a national level tournament they found there were no significant differences between various teams competing at different skill levels. Although the present study was not able to assess ability level as a dependant variable there were significant differences observed between sport teams on various coping skill factors. Second, a strong methodological design grounded in cross-language and cross-cultural literature (Patrie, 2001; Stewart, 1991; Vallerand & Halliwell, 1983; Van de Vijver & Hambleton, 1996) helped facilitate the adaptation and translation process. Although the psychometric properties of the adapted and translated DACSI-36 need to be examined with a larger group of athletes this was the first research study to date to explore the use of coping capabilities in world-class deaf athletes.

The results from the study conducted at the 2007 Winter Deaflympics offer three relevant findings for researchers and practitioners in the field of applied sport psychology. First, there were no significant differences in *Personal Coping Resource (PCR)* scores as a function of gender, test types (i.e., ASL, English) and sport type. Thus, it might be assumed that the DACSI-36 is relatively free of gender, language and sport bias.

Second, although total PCR scores did not differ between sport groups the participants in this study were world-class athletes. As a group, the Deaflympians scored highest on the *Confidence and Achievement Motivation* and *Coachability* factors while their lowest mean score was observed within the inventory on the *Freedom From Worry* factor. During my experiences around the Deaf community and at the Deaflympics I have come to better understand the sense of confidence and pride deaf athletes develop through competition in deaf sport (Stewart, 1991) and observe other possible sources of self-efficacy (Bandura, 1997). During my experience at the Deaflympics I had the opportunity to talk with a number of U.S. athletes and coaches who exemplified this confidence and pride in their respective sport. Although each athlete's experience was different they all expressed a great deal of excitement about being given the opportunity to compete among some of the best athletes in the world.

In particular, I found it interesting when one of the male snowboarders told me there was no way he would get anything but a gold medal. He stated he had been competing for years with some extremely talented hearing athletes and it was that level of competition that gave him the confidence and determination that he would win gold in Salt Lake City. The ice hockey team showed a great deal of initial confidence as well.

However, that team had a near catastrophic breakdown in confidence due to an opening game loss to Russia. With such a critical setback it meant the team had to travel a long and difficult road to make it back into medal contention. After a series of tough games, the ice hockey team pulled its way through by winning each of the remaining pool games and eventually earned the gold medal. I talked with some of the coaches through pool play and each thought the team was regaining confidence and motivation with each dramatic win and that by the middle of the tournament the athletes felt they were capable of not only medaling but being gold medalists.

Much of the self-confidence research draws upon the work of Bandura (1997) and contends that one of the most influential sources of self-efficacy is past performance. In these brief examples, both the snowboarder and ice hockey team increased their efficacy by drawing upon past performance. In this way, previous successful performances provided a catalyst that helped these Deaflympians feel as if they were capable of achieving a high level of performance.

As previously mentioned, the lowest mean scores for the athletes who competed at the Deaflympics was on the factor scale *Freedom From Worry*. This would suggest that relative to the other factor scales the participants in this study might be taught coping skills to address this factor. Facilitative skills such as thought stoppage, countering and reframing have been shown to help athletes who excessively think about and dwell on poor performance or making mistakes (Weinberg & Gould, 2007). While collecting data for another research study I had the opportunity to talk at length with an NCAA Division I ice hockey player who was deaf. He expressed frustration because the head coach and other players were all hearing. As a result, when the coach gave feedback to the

members of the team he would often leave the deaf athlete out or give very brief and meaningless constructive feedback. During later performances the athlete wondered how he was supposed to improve his performance without the coach's suggestions and would often find himself dwelling on potentially unfortunate or catastrophic outcomes hoping to avoid bringing additional negative attention to himself. Although this case may not be a universal experience for deaf athletes, it is an example of one way the intersection of language, social climate and coping skills can intersect to influence performance.

The third meaningful finding was evidenced in the differences observed between various sport groups on several factor scales. The *Confidence and Achievement Motivation* factor scale mean score for the curling athletes was significantly differed from the alpine skiing athletes. The same two sport groups differed significantly on the *Freedom From Worry* scale; however, alpine skiers had higher mean factor scores compared to curlers. Additionally, snowboarding, ice hockey and curling groups each had significantly higher mean scores on the *Peaking Under Pressure* factor scale when compared to the alpine skiing group. These results taken may together offer promising findings for the field of sport psychology and individuals involved in deaf sport. As previously mentioned, there have been numerous investigations of able-bodied athletes that have identified the types of physical and psychological demands they experience and how they cope with the demands (Gould, Eklund, & Jackson, 1992a, , 1992b; Gould, Finch, & Jackson, 1993; Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999; Gould, Jackson, & Finch, 1993a, , 1993b; Scanlan, Stein, & Ravizza, 1991; Woodman & Hardy, 1998). However, there has been relatively little research that thoroughly addressed similar demands and psychological skills of athletes in deaf sport (Clack & Sachs, 1991).

The results of the current study revealed that deaf curlers were significantly more confident when compared to deaf alpine skiers. This does not mean that alpine skiers lacked confidence but rather that the curling team exhibited a relatively high level of confidence in these games than did their alpine skiing counterparts. During a conversation with the curling coach (she coached both the men and the women's teams) she discussed her team's preparation coming into the Deaflympics. She stated that she was pleased with the team because they were really "coming together." Both the men and the women had the opportunity to perform with their respective teams in a few competitions leading up to the Deaflympics. Some of the curling athletes echoed the coach's feeling that it was this preparation and sense of coming together as a team that helped them feel confident during the days leading up to competition. In these cases, though the athletes were realistic about the level of competition they would be facing during pool match-ups and embraced these obstacles and looked forward to the challenge ahead.

The present results also revealed that snowboarding, ice hockey and curling athletes had significantly higher *Peaking Under Pressure* scores when compared to alpine skiers. My contact with the head coach of the both men's and women's alpine skiing teams helped shed some light on this finding. The coach said she was working with quite a few younger athletes. Many of the alpine skiers (a number of which were minors) did not have much experience competing at the international level of competition. The coach recognized she had some very talented competitors with previous Deaflympic experience but not as much as her teams in years past. For many athletes the ability to cope with pressure situations where outcome and performance is

uncertain is a skill that develops with experience. Researchers have suggested physical skill merely accounts for some of the variation that differentiates novice from expert performers (Starkes, Helsen, & Jack, 2001). A variety of perceptual and cognitive thought processes - including strategic and tactical factors - characterize elite, world-class competitors. With increased perceptual and cognitive skills an athlete is more likely to be able to manage the situation and select an appropriate response. For the alpine skiing coach the lack of experienced depth within the team might account for some of the decreased ability to cope with stress in pressure situations.

Conclusions

In the present study a promising ASL inventory was developed that can potentially address deaf athletes' coping skills on a level comparable to a standard coping inventory (R. E. Smith, Schutz, Smoll, & Ptacek, 1995) or another translated psychological skills inventory (Clark & Sachs, 1991). The DACSI-36 is a cross-cultural and cross-language assessment that takes into consideration the perspective of deaf athletes. The world-class deaf athletes who completed the inventory exhibited a wide range of coping skills; however, the data suggested there was some variability within and between sport groups. In light of previous research demonstrating that various coping and psychological skills can be taught and can enhance athletes' performance (Greenspan & Feltz, 1989; Weinberg & Comar, 1994), the DACSI-36 offers a promising instrument for assessing deaf athletes coping skills and enabling them to determine areas in need of improvement. Sport psychology consultants can then work with deaf athletes to enhance these skills.

Limitations and Future Research

There were several limitations to the methodological design and the data collection process in the present study. First, data collection was delimited to deaf athletes who were competing at the 2007 Winter Deaflympics. This rather homogeneous group of world-class athletes represented the best in their respective sports. With the adaptation and development of the DACSI-36, it will be necessary to conduct future research with a wider variety of deaf athletes at all ages and levels of sport.

A second limitation was the discrepancy between the time required of participants to complete the ASL and the English inventory versions. During the scale development it was believed that both inventories would require approximately 20-30 minutes to complete. Actual administration of the tests revealed that the time required to complete the English version had been overestimated and the time to complete the ASL video version had been underestimated. During the Olympic study, far more participants completed the English inventory compared to the ASL version. Although participants were instructed to complete the inventory version of their preference it is possible that some participants chose to complete the English version due to its shorter time length. Future research should attempt to achieve parallel language forms that require nearly the same amounts of time to complete. This is especially challenging with a video assessment in ASL because the inventory does not lend itself well to self-paced completion.

A third limitation of the study was the small sample size used during the pilot study. Increased variability in the data could have affected initial psychometric reports for the DACSI-36. Therefore, conclusions drawn from the current research should be

viewed with some caution. Additional testing with a larger sample of deaf athletes from a wide range of sport experiences would extend the results of the present study and solidify the psychometric properties of the test. Future researchers might also access larger groups of deaf athletes at national tournaments and competitions, state schools for the deaf, and universities with deaf athletic teams.

A final limitation of the study was that the methodological design limited the types of validity that could be determined. Further testing is needed to address other forms of validity such as predictive, discriminative and incremental validity. With increased validity and reliability for both versions of the DACSI-36 it is possible that the inventory can be used to assess coping skills of athletes across a wide range of deaf sports.

A final point regarding future research has to do with the meaningfulness of doing sport psychology and disability research with world-class athletes. Although the present study focused on world-class deaf athletes there are other elite athletes with a wide range of disabilities. Many of the coping skills used by deaf athletes may be similar to the kinds of skills used by other hearing athletes. Other disability organizations might be open to having educational sport psychologists conduct research on other populations of disabled athletes.

Applied Conclusions

The process of affiliating and aligning myself with the United States of America Deaf Sports Federation and Deaflympic Executive Board was an integral step in this research process. Sport psychology consultants interested in working with sport organizations and athletes at the national and international levels - both *able*-bodied or disabled - should recognize the value of applied research but realistically balance that

with an understanding of the difficulty associated with gaining approval from governing bodies.

Collecting data at the 2007 Winter Deaflympics was not an overnight process or an in-and-out data collection experience for me. I spent years struggling to learn ASL and gain acceptance within a cultural group that is exponentially different from what I had grown up with and experienced throughout the better part of my life. My patience was tested on a daily basis; however, the accumulation of these days, weeks, months and eventually years of experience enabled me to propose a research project to the governing members of the oldest sport organization for persons with disabilities (Deaflympics, 2007). Collecting data was an absolutely amazing experience as I not only interacted with more than half of the U.S. athletes and coaches but with deaf athletes from all over the world. My cross-cultural understanding of deaf sport has been broadened during this project and for the experiences I had and the individuals I encountered I am thankful.

Recommendations

I have several recommendations for other applied researchers or sport psychology consultants doing studies with athletes representing different cultural groups. First, language is one of the most influential factors that distinguishes a culture. If you passionately desire to conduct research or do applied work with a cultural group that uses a language other than your primary language it is worth the time and energy learn that language. Interpreters can be used to facilitate communication but when attempting to gain acceptance and trust within a cultural group there are few substitutes for language fluency. As you acquire the language, setbacks and obstacles are bound to be encountered. When the language seems so incredibly frustrating that you feel the need to

give up, give it two more days and when those two days are done give it two more.

Eventually, the two-day contracts will help you open up new possibilities for research and applied work.

Second, the data acquired during the Deaflympics was obtained from athletes before or after their competition. Many completed the inventory between practice and competition times. Those conducting applied research during competition should exercise the utmost respect for the schedules and concerns of athletes, coaches and members of the governing body. When I arrived in Salt Lake City my first priority was contacting the members of the USA Deaf Sports Federation and head coaches. Although I was in Salt Lake City for 11 days it took approximately four days to meet some of the members of the executive board, coaches, training staff and eventually a few of the athletes. At no point did I approach an athlete without his/her coach's assent. In hindsight I believe that the 68 percent participant response rate was high because I had full support of the Executive Board, the USA Deaf Sports Federation and the coaches.

A final recommendation for researchers or practitioners potentially interested in working with deaf athletes is the importance of realizing that those athletes at the highest level of competition in deaf sport truly are world-class athletes. They suffer from no disability in the sense of being non-abled athletes and, therefore, ask for no special treatment or pity. Deaf athletes are extremely competitive and enjoy sport in much the same ways other individuals in mainstream sports do. Developing research protocols or doing consultative work with deaf athletes is possible with careful attention to communication preferences and cultural variation.

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APPENDICES

Appendix A: Review of Literature

Disability Sport

Hanrahan (2005) points out the danger in assuming that able-bodied athletes and disabled athletes are uniquely different from one another when considering the most appropriate sport psychology interventions. She states: “Within a sporting context, athletes are more alike than different, regardless of their intellectual, sensory, or physical capabilities” (Hanrahan, 2005, p. 223). A growing body of research in able-bodied sport has identified a number of factors that influence performance (Gould, Finch, & Jackson, 1993; Gould, D., Guinan, D., Greenleaf, D., Medbery, R., & Peterson, K., 1999; Gould, Jackson, & Finch, 1993a; 1993b; Scanlan, Stein, & Ravizza, 1991; Woodman & Hardy, 1998). By understanding some of the factors that influence able-bodied sport performance it might be possible to begin drawing parallels to disability sport, as well as identifying important distinctions between the two.

Mental demands in able-bodied sport. In a series of studies, Gould and colleagues (Gould, Finch, & Jackson, 1993; Gould, Jackson, & Finch, 1993a; 1993b) investigated the types and sources of stress figure skaters experience in relation to training and competition. The types of stress athletes identified included: (a) relationship issues with coaches, family members and significant others; (b) dealing with the expectations to succeed; (c) psychological, physical and environmental demands; and (d) life direction concerns (e.g., career changes). Similarly, Scanlan, Stein, and Ravizza (1991) examined the sources of stress in the sport of figure skating by looking at former elite figure skaters. These athletes identified some of the sources of stress relating to negative aspects of competition, including concerns about significant others (e.g.,

interpersonal conflict), financial matters, psychological demands of skating, and personal struggles associated with competing.

In addition to the aforementioned research, there is more recent evidence pertaining to the social and organizational factors that influence performance (Noblet & Gifford, 2002; Woodman & Hardy, 1998). Noblet and Gifford (2002) conducted interviews and focus groups with a variety of professional footballers and found a wide range of factors that seem to influence performance. These performance-related factors included: (a) problems associated with the work/non-work interface (e.g., relocation concerns, work/non-work conflict); (b) demanding nature of the work (e.g., job content concerns, injuries); (c) negative aspects of interpersonal relationships (e.g., coaching staff, support staff); (d) career development concerns (e.g., uncertain future participation, post-football uncertainty); and (e) negative aspects of organizational systems and culture (e.g., poor communication, low participation in decision making, negative cultural norms). Woodman and Hardy (1998) provided additional support for the negative influence of administration, politics, and uncertainty in planning on athletes' performance.

The research to date regarding some of the demands of able-bodied sport seems to encompass a wide variety of physical, psychological, environmental and organizational factors. Given that athletes with disabilities should be viewed as athletes first, there is the potential for able-bodied and disabled athletes to share a number of performance-related concerns. Hanrahan (1998, 2005) points out that athletes with a variety of disabilities have a number of the same performance demands as able-bodied athletes. However,

accompanying issues and concerns of individuals in disability sport represent additional demands that must also be considered.

Mental demands in disability sport. A limited amount of research in disability sport parallels the findings of studies examining the mental demands and psychological skills of able-bodied athletes (Henschen, Horvat, & Roswal, 1992; Hutzler, 1992; Kirby, 1995; Martin & Mushett, 1997; Watanabe, Cooper, Vosse, Baldini, & Robertson, 1992). For example, Hutzler (1992) found that wheelchair tennis players increased their psychological skills (e.g., empowerment, self-confidence) and their proficiency in using their wheelchairs through sport participation. Martin and Mushett (1997) provided additional evidence that athletes with disabilities use psychological skills (e.g., goal setting, thought stoppage, imagery) and Henschen, Horvat, & Roswal (1992) found that disabled athletes can achieve success in developing mental skills over time. This body of research suggests that psychological skills are not that different for disabled athletes when compared to able-bodied athletes. It is important to note, however, that there are a number of unique concerns and challenges individuals with disabilities encounter. These concerns must be taken into consideration when discussing mental demands and psychological skills in disability sport because their salient presence influences almost all aspects of disabled athletes' lives, including sport performance.

Given the variety of concerns and challenges that are pervasive in the lives of disabled athletes a clearer understanding of frameworks for discussing disabilities may help shed some light on these in the context of sport. Two frameworks that help explain the sport experience for disabled athletes include the medical model and the socio-cultural model. O'Donnell (1997) posits that disabilities have historically been viewed

from a medical model that works primarily from a biological perspective. This means that disability has been conceptualized as an impairment that limits an individual's capacity to function fully in everyday life (Thomas, 1982). The socio-cultural model suggests that disability operates within the socio-cultural and political environments (O'Donnell, 1997). This model does not disregard the medical model because it assumes that many of the societal perceptions and beliefs surrounding disability are embedded within the medical model. According to Wendell (1996), the authority to make decisions that impact those with disabilities "...operates far beyond medical institutions-inside and in relation to government bureaucracies, insurance companies, courts, schools, charities, rehabilitative organizations, and institutions for long-term care" (p. 117).

One of the limitations of the medical model is the overemphasis on impairment because it assumes the problem resides within the individual and that any problems are the individual's own creation (O'Donnell, 1997). When an overemphasis is given to an impairment, potential barriers to participation in sport are created. Often, parents, teachers, and coaches are overprotective because they believe the athlete with a disability has suffered enough pain and, although well-intended at times, these individuals do not want to see the athlete experience additional discomfort or injury (Hanrahan, 2005). This approach is often counterproductive because it does not challenge the athlete to undertake roles on his/her own. From a developmental perspective, especially in the case of young athletes, limiting autonomy and self-exploration due to overprotection can have a negative impact upon the athlete's physical self-concept (Humphrey, 2003). Campbell and Jones (1997) point out that individuals with disabilities may not be taught a competitive orientation toward many parts of life, including sport, and as a result may not

develop the personal dispositions and life skills (e.g., competitiveness, coping strategies, sport specific motor skills) that would allow them to achieve a healthy self-confidence in order to be successful in sport environments.

A second limitation of the medical model is the assumption that the socio-cultural and political environment is independent of the disabled condition. The perceptions embedded within society significantly influence how disabled persons experience life. For example, before the Amateur Sports Act was enacted in 1978 federal funding for disability sport was relatively nonexistent because it was commonly believed that persons with disabilities could not participate in sport due to fragile and weak bodies. Not only did mainstream society limit participation in sport but many disabled persons internalized societal perceptions and assumed they were not capable of participation (D. A. Stewart, 1991).

Taken together, the limitations of the medical model creates a need to explore disability sport from a perspective that better encapsulates the disability sport experience. The socio-cultural model provides such a framework because there are a variety of psychological and environmental factors that have the potential to significantly influence the mental demands of disability sport. One of the socio-cultural factors that influences sport performance relates to developmental concerns. How people react to their disability often depends on the nature of the disability and age of onset (Hanrahan, 2005). These factors have the possibility of creating a unique psychological demands because individuals with disabilities gradually grow and develop to understand and recognize that they are different from other able-bodied individuals. This self-awareness soon becomes an understanding that they are often negatively viewed by the mainstream community

(Vash, 1991) and are at times thought of as “second-class” athletes. This is exponentially more problematic for individuals with severe disabilities because there is often a feeling of powerlessness in their interactions with others (Martins, 1999).

A second factor within the sociocultural and political environments includes accessibility issues. Access to opportunities, facilities and equipment is often limited or creates an additional burden for individuals with disabilities (DePauw & Gavron, 2005; Hanrahan, 2005). For example, not all communities provide adapted sporting opportunities for persons with disabilities due to lack of funding, bias attitudes, and/or limited progression in providing accommodations (e.g. wheelchair ramps, modification to physical structures, promoting participation). Often specialized equipment, rules and classification systems are necessary in order to allow complete access to disability sport (DePauw & Gavron, 2005; Hanrahan, 2005). In addition, specialized equipment can be more expensive than many disabled persons can afford and maintain. Furthermore, lack of information regarding the various rules and classification systems, which are often updated and changed, can be confusing and mentally demanding, creating an ongoing stressor or barrier to performance (DePauw & Gavron, 2005).

In summary, although there is a lack of sport psychology research specifically addressing the mental demands of disability sport there are a number of issues and concerns that are unique to this subgroup of athletes. Athletes with disabilities must deal with specialized equipment, rules, classifications, and accessibility issues; this adds an extra dimension of mental demands that those in able-bodied sport do not have to contend with on a regular basis.

Deaf Sport

A review of the literature in both research and practice with deaf athletes reveals only one sport psychology related study. In that study Clark and Sachs (1991) translated the Psychological Skills Inventory for Sport (PSIS, Mahoney, Gabriel, & Perkins, 1987) and administered it to a group of national deaf volleyball players. Players were grouped according to skills level (current Deaflympic players, recreational players, developmental players, and former Deaflympic players) and no differences were found on any of the six inventory subscales (anxiety, concentration, confidence, mental preparation, motivation, and team emphasis). The authors, therefore, concluded that national-level deaf athletes and recreation deaf athletes are sport participants just like any other group of athletes and that the psychological skills and mental demands have the same impact on this subgroup of athletes as it does on hearing athletes.

While the Clark and Sachs (1991) study represented an initial attempt to bridge the gap on the study of deaf sport and sport psychology, little is known about the mental demands of Deaf sport. As discussed previously, Clark and Sachs (1991) provided normative data that suggests psychological skills are one important aspect of deaf sport participation. However, there are also other demands that might be unique to this subgroup of athletes that have yet to be explored.

As mentioned previously, being deaf is often viewed as a unique and separate classification of a disability. In fact, many persons who are deaf do not consider themselves disabled. This is often the case because there is a large body of literature and research that gives attention to two opposing orientations to deafness. The medical model views deafness as a disability and incorporates terms such as “hard-of-hearing”, “hearing impaired” and “deaf” in references to varying degrees of hearing loss (Scheetz,

2001). The focus of the medical model is on the loss of hearing and the adversities associated with deafness.

The sociocultural orientation of being deaf acknowledges a variety of psychological and environmental issues that present potential mental demands for individuals competing in disability sport. From this perspective, the term “Deaf” when capitalized is a concept used to refer to members of the Deaf community and Deaf culture. Individuals within this community share unique psychological and social needs as well as seek activities and organizations that promote and maintain the specialized interest of the community (Scheetz, 2001). Deaf sport is one such social institution that brings Deaf people together in a way that acts as a support system, social network, and educational system that promotes the values of the Deaf community (Stewart, 1991). Deaf individuals “...exercise their right to self-determination through organization, competition, and socialization surrounding Deaf Sport” (Stewart, 1991, p.2). Within this context there are a number of psychological and environmental factors that might affect performance of deaf athletes.

Psychological factors affecting performance. There are number of psychological factors that are unique to deaf sport, each having the potential to influence performance. These factors include communication, competing values, and intrapersonal pressure to compete (Stewart, 1991). Communication is one of the critical features of the Deaf community. Often, the preferred and primary language of the Deaf is ASL, American Sign Language (Moore & Levitan, 2003). When the deaf athlete interacts with other deaf athletes there is complete access to communication. However, many Deaf athletes train and compete with hearing athletes due to the difficulty they have finding teams or for the

enjoyment of the physical challenge of competing with hearing athletes (Stewart, 1991). When this is the case there can be a communication gap, resulting in a great deal of frustration and anxiety. At times, the deaf athlete may feel uncertain as to what is going because s/he does not have complete access to instructions and feedback as do the other hearing athletes (Grindstaff, 2002). When communication is limited a barrier exists that prevents the deaf athlete from participating in the same manner as hearing athletes.

A second psychological factor with the potential to influence performance is competing values. The Deaf community and the hearing world often have different value systems (Stewart, 1991). For example, one of the unique values found in the Deaf community is an emphasis on educational background. There is a great deal of pride associated with attending a residential school for the deaf as compared to public schools (Scheetz, 2001; Stewart, 1986). When a deaf student attends a residential school for the deaf s/he is allowed to realign his/her social behaviors in a manner that conforms to what might be expected in the Deaf community. The deaf student who competes in a sport through his/her residential school for the deaf feels a great sense of Deaf pride and commitment for his/her team that goes beyond school spirit. It is a value that is deeply ingrained in the Deaf community and one that individuals with a hearing perspective find difficult to completely understand. Other values emphasized within the Deaf community include resentment of negative interference of the hearing culture, strong support system for other deaf individuals, intrinsic motivation to promote Deaf culture, and the autonomy to control their own lives separate from hearing dogmatism (Stewart, 1991).

Another psychological factor that has the potential to influence performance in deaf sport is the pressure to compete (Stewart, 1991). Being deaf is a low-incidence

disability and as a result the Deaf community represents a finite number of individuals. The availability of deaf sport participants for any given sport is limited, especially when considering factors such as sport interest, travel time, schedule conflicts and other commitments. As a result, Stewart (1991) believes that some deaf players might feel pressured to compete due to limited numbers in the Deaf community.

Environmental factors affecting performance. The social and organizational climates of the Deaf community present a variety of demands for individuals competing in Deaf sport. Some of the factors that influence the social climate include the home environment, socialization processes, and pressure to assimilate. The home environment is an important aspect of being deaf because the "...social behavior of Deaf individuals, in part, reflects their adjustment to deafness as well as their response to the psychological forces they face in society" (Stewart, 1991, p. 46). Approximately 90% of deaf children are born to hearing parents (Scheetz, 2001) so there is usually a communication gap between the hearing parents and the deaf child. How parents reacts to their child being deaf varies (e.g. denial, anger, resentment, guilt, turning toward religious affiliations, projecting blame, positive outlook toward the future) and influences not only the parent-child interaction but eventually the development of the child (Vernon & Andrews, 1990). Communication is often impacted the most when hearing parents have negative reactions to the deafness of their child (Stewart, 1991). As Stewart (1991) suggests, "The extent to which hearing parents are able to instill a set of mores and beliefs in their deaf child is likely below that which can be of deaf parents of deaf children or hearing parents of hearing children" (p. 51). For some deaf individuals who lack sufficient communication skills sport might be especially demanding because of their inability to expressively

convey and receive information (Stewart, 1991). However, as the deaf child develops and acquires language through acculturation in the Deaf community sport can become a relaxing environment where s/he can more comfortably express concerns.

The socialization process in sport is another concern for deaf sport participants. There is evidence to suggest that Deaf athletes enjoy competing in and against hearing teams due to the challenge (Stewart, Robinson, McCarthy, 1991). However, deaf athletes tend to prefer training with other deaf athletes due their ability to communicate before, during, and after practice sessions. As a result, Stewart and colleagues (1991) point out that deaf athletes must consider and balance their desire to compete against better competition with the need to socialize and interact with teammates and coaches.

A third environmental factor that influences deaf sport participation is the pressure to assimilate (Moore & Levitan, 2003). Situations occur when a member of the deaf community branches out and attempts to excel in an area (career, education, sport) that members of the Deaf community feel challenges the status quo and aligns the individual with the hearing world. A deaf individual attempting to compete and excel in hearing sport might feel resentment from his/her peers, adding additional pressure and mental strain to the practice and competition environment. Although pressure to assimilate is not valued by every member of the Deaf community instances do occur.

In addition to social factors in the environment, it is also important to consider the organizational factors that have the potential to affect Deaf athletes' performance. One of the organizational factors hearing athletes do not have to think about on a regular basis is classification rules for participation. Deaf communities often face logistical problems when organizing sports due to limited numbers. As is often the case, classification for

what it means to be “deaf” differs at the local, regional, national and international levels. An individual with a slight hearing loss might qualify to compete in local or regional Deaf sport events but may not be permitted to participate national and international competition because s/he does not meet the minimum hearing loss requirements (Stewart, 1991). Membership in deaf sport events and competitions at the elite levels means athletes are brought together based upon their unique communication needs and limited reliance on spoken language (Stewart, 1991).

Summary. In summary, Deaf athletes compose a unique subgroup of participants in disability sport. Their accomplishments have received recognition at the highest levels of sport including the Olympic Games, Deaflympics, and professional sports. According to at least one initial study, Deaf athletes encounter a number of the same mental demands (e.g. anxiety, concentration, confidence, mental preparation, motivation, and team emphasis) that hearing athletes face on a regular basis. Although deafness as a disability (and other disabilities for that matter) is often not the primary focus of sport participation, the multitude of factors addressed in this review suggest there are underlying issues and concerns that should be recognized when addressing the mental demands of Deaf sport. The limited available evidence suggests that there are psychological and environmental factors that are unique to individuals with disabilities, and some factors that are exclusive to Deaf athletes. Further research is needed to determine the extent to which these factors have an impact on the sport experience and performance of Deaf athletes.

Translation Concerns

Assessments are often used to gain access to intrapersonal information in a wide range of fields such as medicine, business, government, education, psychology and sport. The use of assessments in sport psychology did not gain popularity until the 1980's when sport psychology researchers were interested in personality constructs of elite versus non-elite athletes (Auweele, Nys, Rzewnicki, & Van Mele, 2001). In the past few decades researchers and practitioners have expanded the use of sport psychology assessment to include cross-cultural assessment. Given this expanded use of assessments there are a number of concerns and controversies associated with cross-cultural psychological assessment (Lin, Chen, & Chiu, 2005). Additional issues and concerns are present when conducting cross-cultural research with deaf sport participants. These issues and concerns include cultural variation, linguistic differences and cross-cultural assessment biases.

Cultural variation. Cultural variation includes the differences between the dominant hearing culture and how Deaf culture operates. A capital "D" is used to identify various aspects of Deaf culture and/or the Deaf community (Moore & Levitan, 2003). The majority of what is understood about deaf sport is addressed through the broader domains of disability sport (DePauw & Gavron, 2005) and literature that focuses on sociological aspects of deaf sport participation (Pinella, 1980; D. Stewart, 1986). However, in the field of psychology researchers have pointed out that psychological assessments have often been misused with Deaf populations (Brauer, Braden, Pollard, & Hardy-Braz, 1998; Lane, 2005; Pollard, 1993). Often, psychological assessments are developed with hearing norms and do not take into consideration the unique aspects the surround Deaf culture. For example, a standard psychological intake assessment might

ask the question, “Do you ever hear voices that tell you to do things?” Depending on the degree of hearing loss this question would not have cultural relevance for an individual who is profoundly deaf. In a sport context an adolescent athlete who is deaf might live in a school district where the high school has a strong tradition of state champion football teams. However, within the same school district there might be a strong Deaf community and residential school for the deaf. Although this deaf athlete is an exceptional quarterback it is not uncommon for students who are deaf to feel a great sense of Deaf pride associated with attending a residential school for the deaf. The decision to attend the residential school for the deaf instead of the school with a traditionally strong football program might seem incomprehensible to some people from a dominant hearing community.

Linguistic differences. There are a number of linguistic differences that differentiate English and American Sign Language (ASL). These differences require careful attention when translating an assessment. American Sign Language (ASL) is the preferred and primary language of individuals who are deaf across the United States and many parts of Canada (Moore & Levitan, 2003). ASL is a unique and legitimate language that operates within the context of a hearing society that depends heavily upon spoken English. Although the two languages function within the same geographical location and ASL borrowed some features from English the two are distinctly different modalities of communication with different grammatical and linguistic structures. The legitimacy of ASL as a true language has long been debated. Many persons and groups assume ASL is English-based and operates in a similar manner like other communication systems for English such as Morse code. However, with a unique linguistic and

grammatical structure ASL is not a form of manually coded English (Valli & Lucas, 2005). Like other languages, ASL can be studied at the phonological, morphological, syntactic and semantic levels (Valli & Lucas, 2005). At the phonetic level, all signs in ASL have four parts including handshape, movement, location, and palm orientation. It is possible for various signs to share some phonetic features but a change in one feature can completely alter the meaning of the sign. An example can illustrate this point. The handshape, movement and palm orientation for the signs “summer”, “ugly” and “dry” are all the same: however, the location of the signs differ as they are produced with one hand around different parts of the face.

Syntax refers to the grammatical structure of language while semantics refers to the meaning of vocabulary as it is arranged and structured (Valli & Lucas, 2005). Similar to English, many ASL sentences follow a subject-verb-object structure (e.g. “The boy runs to second base”). However, as previously mentioned this does not mean they are based on the same language system. ASL sentences are grouped according to syntactic rules; errors in structure can alter the meaning at the semantic level. As a result, when translating an assessment, errors at the various levels of language discourse can jeopardize the accuracy of the translated product.

Cross-cultural assessment bias. Simply adapting or translating a sport psychology assessment from a source language does not ensure an accurate assessment within the context of the target language. There are three important biases researchers and practitioners must be aware of when translating and administering an assessment (Van de Vijver & Hambleton, 1996). These concerns include construct, method and item biases. Construct biases occurs when there is discrepancy between a construct in one

culture with a similar construct in another culture. Method bias is attributed to inaccurate administration procedures of the assessment. Item bias occurs when items function differently across cultures and is often attributed to how the assessment is translated. Each of these types of biases is discussed in further detail with accompanying examples relevant to deaf sport.

Construct bias is problematic for cross-cultural assessment because not all constructs are similar or present across cultures. According to Van de Vijver and Hambleton (1996), there is reason to believe some constructs show “non-negligible discrepancy” when comparing one culture to another culture. As a result, there are a number of differences between the dominant hearing culture and Deaf culture that warrant attention when considering assessment translation between English and ASL.

Mindess (1999) provides a context to explore some of the distinctions between American hearing culture and Deaf culture. For example, cultural values such as independence and self-reliance, egalitarianism, personal choice, individualistic problem solving, and informal and moderately direct communication are more broadly characteristics of the dominant hearing culture. Within a sport context, self-reliance is an important value because athletes believe they can be independent and when challenged use their talents to step up their level of play in order to achieve success. Although there is certain degree of team play involved, one of the factors that contributes to successful performance is an individual’s self-confidence and belief in him/herself (Arkes & Garske, 1982; Vealey, 1986).

There is some degree of overlap between values in American hearing culture and Deaf culture. Values that seem to define Deaf culture include group dependence and

information sharing, limitations to personal choice, lifelong friendships, group problem solving, direct communication, and strong affiliation to being deaf and its primary language - ASL (Mindess, 1999). Although competition and competitiveness draw people who are deaf to sport there are other motives for participation. Deaf sport is an important aspect of the Deaf community because it brings people together in a way that strengthens the bonds between them and allows for complete and full access to communication (D. Stewart, 1986).

The differences between American hearing culture and Deaf culture are varied. With the overwhelming majority of psychological assessments being developed based upon hearing norms adapting and translating an assessment can be difficult. In order to translate a sport psychology assessment from English to ASL, careful attention must be given to culturally relevant information that potentially controls for construct differences between the two cultures.

The second form of biases is method bias. This form of bias is attributed to the various forms of administrative problems. Errors that lead to this type of bias can include, but are not limited to, test-takers unfamiliar with the assessment, social desirability of item responses, and issues concerning the environment where the test is administered (Lin, Chen, & Chiu, 2005). Deaf athletes who are not familiar with psychological assessment might feel uncomfortable during the administration process. Participants might respond in socially desirable ways, in ways that conform to other participants, or even with random responses. Without clear and understandable explanations and descriptions of the assessment it is likely that data collected from deaf athletes will have both validity and reliability concerns.

The environment where the test is administered warrants attention because deaf athletes have a few unique concerns that might not affect hearing athletes in the same manner. A room with excessive noise (e.g., construction in a nearby building) would be distracting for a hearing athlete and, thereby, call into question item responses because participants might not have been able to give their attention to the assessment. Visual distractions can be equally problematic for athletes who are deaf. In addition, inadequate lighting, excessive moving around the room while the test is administered, and limited view of visual aids are example of distractions that should be anticipated and then handled accordingly.

The third form of bias is item biases. This type of bias is attributed to differences in the way items function between cultures. This form of bias is sometimes referred to as differential item functioning (Lin, Chen, & Chiu, 2005). Lin and colleagues state that situations such as poor wording, inaccurate translations, and inappropriateness of item content between cultures can decrease assessment validity.

Completely eliminating construct, method and item biases might be difficult to fully attain. Therefore, the goal should be to minimize the effects each has on cross-cultural assessment. In addition to reducing the effects of such biases Geisinger (1994) and Van de Vijver and Hambleton (1996) provide a variety of suggestions and guidelines for cross-cultural research. This information taken together suggests that validity of the translated assessment must be demonstrated. In order to do so the translation process should include either a forward and/or back-translation process of a statistical method known as multiple group confirmatory factor analysis. When utilizing one of these two processes, Hambleton and Patsula (1999) suggest that translators be fluent with both the

source and target languages. Often, utilizing a team of translators can aid in developing a more accurate translation because team members can share and discuss ideas when discrepancies in the translation process occur.

As the translators work their way through the translation process it is important to maintain relevant features of the assessment such as clear description of the item and responses, single correct or best answers, and items should be equivalent when comparing source and target languages (Hambleton & Patsula, 1999). In addition, it is suggested that translators try to avoid slang, jargon, and colloquialisms that might alter the meaning in the target language (Geisinger, 1994; Van de Vijver & Hambleton, 1996). The goal is to develop a culturally relevant translation that maintains the spirit of the original source language.

After the assessment has been translated to the target language and preparation for use with a different cultural group it is critical to field test. Even a fluent translator or group of translators might have a difficult time anticipating all of the potential problems and concerns individuals who complete the assessment might encounter (Hambleton & Patsula, 1999). As problems or concerns occur the necessary revisions to the assessment can be made prior to conducting a large scale research study. Field-testing allows the researcher(s) to establish empirical evidence that the assessment has acceptable validity and reliability. This can save considerable resources (e.g., time and money) throughout the process.

In summary, adapting a sport psychology assessment for use in cross-cultural research in this case with deaf athletes is an intricate process. Simply translating an assessment from a source language to a target language does not ensure the assessment

will measure what it purports to measure. Researchers must be cognizant of some of the various forms of bias that can diminish assessment validity and reliability while at the same time giving special attention to guidelines and suggestions for appropriate adaptation throughout the translation process. This process should be seen as an ongoing endeavor where re-evaluation of validity and reliability continue over time. With these considerations the efficacy of translating an assessment in sport psychology from English to ASL with acceptable psychometric and culturally relevant accuracy will potentially be improved.

The information previously discussed in regard to the psychology of athletes who are deaf along with the discussion regarding assessment adaptation and translation provides a background for the present study. This study purports to extend previous research in the area of sport psychology and deaf sport by adapting an inventory to measure mental skills in elite athletes who are deaf. The information gained from such an inventory has the potential to open a window of opportunity for a group of athletes to explore sport psychology mental skills training.

Appendix B: The Athletic Coping Skills Inventory-28

The Athletic Coping Skills Inventory-28

1. On a daily or weekly basis, I set very specific goals for myself that guide what I do.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

2. I get the most out of my talent and skills.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

3. When a coach or manager tells me how to correct a mistake I've made, I tend to take it personally and feel upset.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

4. When I am playing sports, I can focus my attention and block out distractions.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

5. I remain positive and enthusiastic during competition, no matter how badly things are going.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

6. I tend to play better under pressure because I think more clearly.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

7. I worry quite a bit about what others think about my performance.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

8. I tend to do lots of planning about how to reach my goals.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

9. I feel confident that I will play well.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

10. When a coach or manager criticizes me, I become upset rather than helped.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

11. It is easy for me to keep distracting thoughts from interfering with something I am watching or listening to.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

12. I put a lot of pressure on myself by worrying how I will perform.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

13. I set my own performance goals for each practice.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

14. I don't have to be pushed to practice or play hard; I give 100%

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

15. If a coach criticizes or yells at me, I correct the mistake without getting upset about it.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

16. I handle unexpected situations in my sport very well.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

17. When things are going badly, I tell myself to keep calm, and this works for me.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

18. The more pressure there is during a game, the more I enjoy it.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

19. While competing, I worry about making mistakes or failing to come through.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

20. I have my own game plan worked out in my head long before the game begins.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

21. When I feel myself getting too tense, I can quickly relax my body and calm myself.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

22. To me, pressure situations are challenges that I welcome.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

23. I think about and imagine what will happen if I fail or screw up.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

24. I maintain control no matter how things are going for me.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

25. It is easy for me to direct my attention and focus on a single object or person.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

26. When I fail to reach my goals, it makes me try even harder.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

27. I improve my skills by listening carefully to advice and instruction from coaches and managers.

0 = *almost always* 1 = *often* 2 = *sometimes* 3 = *almost never*

28. I make fewer mistakes when the pressure's on because I concentrate better.

0 = *almost never* 1 = *sometimes* 2 = *often* 3 = *almost*
always

**Appendix C: Deaf Athletic Coping Skills Inventory-36 (DACSI-36) – English
Written Version**

Survey of Deaf Athletic Experience – Written Version

Directions

This survey consists of two parts. The first part includes a variety of background questions while the second part includes a number of statements that athletes have used to describe their experiences in sport. Please read each statement carefully and then recall as accurately as possible how often you experience the same thing. There is no right or wrong answers. All item responses are answered on a 5-point scale ranging from 0-4.

Background Questions

1. How old are you? _____
2. What sex are you? ___ Male ___ Female
3. What is your racial status: (Check One)

a. ___ Caucasian/White	d. ___ Black/African American	g. ___ Other
b. ___ Asian	e. ___ Hispanic/Latino	
c. ___ India(n)	f. ___ Native North American	
4. Are you hearing or deaf? (Check One) ___ Hearing ___ Deaf
 If hearing, are you a certified interpreter? (Check One) ___ Yes ___ No
 If deaf, have you competed in sport? (Check One) ___ Yes ___ No
5. What is your highest level of education completed?

a. ___ GED	b. ___ High School Diploma	c. ___ Associates Degree
d. ___ Bachelor's Degree	e. ___ Masters Degree	f. ___ Doctoral Degree
g. ___ Other (Please explain) _____		
6. What was your overall GPA in the highest level of education completed? (Check one):

a. ___ less than 1.5	b. ___ 1.5-2.0	c. ___ 2.0-2.49	d. ___ 2.50-2.99
e. ___ 3.00-3.49	f. ___ 3.50-3.99	g. ___ 4.00	
7. If deaf, what is your preferred method of communication?

___ ASL	___ Signed English	___ Written English	___ Oral English
---------	--------------------	---------------------	------------------
8. What sport(s) do you play? (check all that apply)
 - ___ Alpine Skiing
 - ___ Nordic Skiing (Cross Country Skiing)
 - ___ Curling
 - ___ Ice Hockey
 - ___ Snowboard
 - ___ Other _____

9. If you are/were an athlete how would you rate your performance in the sport you compete in?

- ☐ 1= far below average (*bottom 20%*)
☐ 2= below average (20-45%)
☐ 3= average (45-55%)
☐ 4= above average (55-80%)
☐ 5= far above average (*top 20%*)

10. If you are currently an athlete, due to injury approximately how many days of practice and competition have you missed in the past year?

- ☐ 0 ☐ 1-3 ☐ 4-7 ☐ 8-12
☐ 12-15 ☐ 16-21 ☐ 22 or more

11. If you are completing this survey post-competition how did you place in your respective sport at the 2007 Deaflympics?

- ☐ Gold medal ☐ Silver medal
☐ Bronze medal ☐ Other (What place finish? _____)

DIRECTIONS: Please read each of the following statements and indicate on a scale of 0-4 (0=almost never, 2= sometimes, 4=almost always) the response that best indicates your agreement with each individual statement.		Almost Never	Sometimes			Almost Always
1	On a daily or weekly basis, I set very specific goals for myself that guide what I do.	0	1	2	3	4
2	I get the most out of my talent and skills.	0	1	2	3	4
3	When I am playing sports, I can focus my attention and block out distractions.	0	1	2	3	4
4	I remain positive and enthusiastic during competition, no matter how badly things are going.	0	1	2	3	4
5	I tend to play better under pressure because I think more clearly.	0	1	2	3	4
6	If I excel in a hearing sport I rarely think about what other member of the Deaf community think about me.	0	1	2	3	4
7	I tend to do lots of planning about how to reach my goals.	0	1	2	3	4
8	I feel confident that I will play well.	0	1	2	3	4
9	It is easy for me to keep distracting thoughts from interfering with something I am watching or listening to.	0	1	2	3	4
10	If I compete in sports with other deaf athletes I feel more confident.	0	1	2	3	4
11	I set my own performance goals for each practice.	0	1	2	3	4

12	I don't have to be pushed to practice or play hard; I give 100%.	0	1	2	3	4
13	If a coach criticizes or yells at me, I correct the mistake without getting upset about it.	0	1	2	3	4
14	I handle unexpected situations in my sport very well.	0	1	2	3	4
15	When things are going badly, I tell myself to keep calm, and this works for me.	0	1	2	3	4
		Almost Never		Sometimes		Almost Always
16	The more pressure there is during a game, the more I enjoy it	0	1	2	3	4
17	If I were to compete on a team with other hearing athletes I feel like my deaf friends would support me.	0	1	2	3	4
18	I have my own game plan worked out in my head long before the game begins.	0	1	2	3	4
19	When I feel myself getting too tense, I can quickly relax my body and calm myself.	0	1	2	3	4
20	To me, pressure situations are challenges that I welcome.	0	1	2	3	4
21	I maintain control no matter how things are going for me.	0	1	2	3	4
22	Even if I compete in sport where my coaches and teammates do not know sign language I rarely have problems communicating.	0	1	2	3	4
23	It is easy for me to direct my attention and focus on a single object or person.	0	1	2	3	4
24	When I fail to reach my goals, it makes me try even harder.	0	1	2	3	4
25	I improve my skills by listening carefully to advice and instruction from coaches and managers.	0	1	2	3	4
26	I feel a great sense of pride when I compete in deaf sport.	0	1	2	3	4
27	I make fewer mistakes when the pressure's on because I concentrate better.	0	1	2	3	4
DIRECTIONS: Please read each of the following statements and indicate on a scale of 0-4 (0=almost always, 2=sometimes, 4=almost never) the response that best indicates your agreement with each individual statement.		Almost Always		Sometimes		Almost Never
28	If I compete in sport with teammates or coaches that do not know ASL I often feel frustrated because of problems communicating with them.	0	1	2	3	4
29	When a coach or manager tells me how to correct a mistake I've made, I tend to take it personally and feel upset.	0	1	2	3	4

30	It concerns me if I compete in sports with teammates who are hearing.	0	1	2	3	4
31	I worry quite a bit about what others think about my performance.	0	1	2	3	4
32	When a coach or manager criticizes me, I become upset rather than helped.	0	1	2	3	4
33	I put a lot of pressure on myself by worrying how I will perform.	0	1	2	3	4
34	While competing, I worry about making mistakes or failing to come through.	0	1	2	3	4
35	If I were to play on a team with mostly all hearing players it would bother me.	0	1	2	3	4
36	I think about and imagine what will happen if I fail or screw up.	0	1	2	3	4

Appendix D: Deaf Athletic Coping Skills Inventory (DACSI-36) – ASL Video

Version

Survey of Deaf Athletic Experience – Video Version

Directions

This survey consists of two parts. The first part includes a variety of background questions while the second part includes a number of statements that athletes have used to describe their experiences in sport. Please read each statement carefully and then recall as accurately as possible how often you experience the same thing. There is no right or wrong answers. All item responses are answered on a 5-point scale ranging from 0-4.

Background Questions

1. How old are you? _____
2. What sex are you? ___ Male ___ Female
3. What is your racial status: (Check One)

a. ___ Caucasian/White	d. ___ Black/African American	g. ___ Other
b. ___ Asian	e. ___ Hispanic/Latino	
c. ___ India(n)	f. ___ Native North American	
4. Are you hearing or deaf? (Check One) ___ Hearing ___ Deaf
 If hearing, are you a certified interpreter? (Check One) ___ Yes ___ No
 If deaf, have you competed in sport? (Check One) ___ Yes ___ No
5. What is your highest level of education completed?

a. ___ GED	b. ___ High School Diploma	c. ___ Associates Degree
d. ___ Bachelor's Degree	e. ___ Masters Degree	f. ___ Doctoral Degree
g. ___ Other (Please explain) _____		
6. What was your overall GPA in the highest level of education completed? (Check one):

a. ___ less than 1.5	b. ___ 1.5-2.0	c. ___ 2.0-2.49	d. ___ 2.50-2.99
e. ___ 3.00-3.49	f. ___ 3.50-3.99	g. ___ 4.00	
7. If deaf, what is your preferred method of communication?
 ___ ASL ___ Signed English ___ Written English ___ Oral English
8. What sport(s) do you play? (check all that apply)
 - ___ Alpine Skiing
 - ___ Nordic Skiing (Cross Country Skiing)
 - ___ Curling
 - ___ Ice Hockey
 - ___ Snowboard
 - ___ Other _____

9. If you are/were an athlete how would you rate your performance in the sport you compete in?

- ☐ 1= far below average (*bottom 20%*)
☐ 2= below average (*20-45%*)
☐ 3= average (*45-55%*)
☐ 4= above average (*55-80%*)
☐ 5= far above average (*top 20%*)

10. If you are currently an athlete, due to injury approximately how many days of practice and competition have you missed in the past year?

- ☐ 0 ☐ 1-3 ☐ 4-7 ☐ 8-12
☐ 12-15 ☐ 16-21 ☐ 22 or more

11. If you are completing this survey post-competition how did you place in your respective sport at the 2007 Deaflympics?

- ☐ Gold medal ☐ Silver medal
☐ Bronze medal ☐ Other (What place finish? _____)

DIRECTIONS: Please read each of the following statements and indicate on a scale of 0-4 (0=almost never, 2= sometimes, 4=almost always) the response that best indicates your agreement with each individual statement.

	Almost Never		Sometimes		Almost Always
1	0	1	2	3	4
2	0	1	2	3	4
3	0	1	2	3	4
4	0	1	2	3	4
5	0	1	2	3	4
6	0	1	2	3	4
7	0	1	2	3	4
8	0	1	2	3	4
9	0	1	2	3	4
10	0	1	2	3	4
11	0	1	2	3	4
12	0	1	2	3	4
13	0	1	2	3	4
14	0	1	2	3	4
15	0	1	2	3	4
16	0	1	2	3	4

17	0	1	2	3	4
18	0	1	2	3	4
19	0	1	2	3	4
20	0	1	2	3	4
21	0	1	2	3	4
22	0	1	2	3	4
23	0	1	2	3	4
24	0	1	2	3	4
25	0	1	2	3	4
26	0	1	2	3	4
27	0	1	2	3	4
DIRECTIONS: Please read each of the following statements and indicate on a scale of 0-4 (0=almost always, 2=sometimes, 4=almost never) the response that best indicates your agreement with each individual statement.					
	Almost Always		Sometimes		Almost Never
28	0	1	2	3	4
29	0	1	2	3	4
30	0	1	2	3	4
31	0	1	2	3	4
32	0	1	2	3	4
33	0	1	2	3	4
34	0	1	2	3	4
35	0	1	2	3	4
36	0	1	2	3	4

Appendix E: IRB Form

FORM B

IRB # _____

Date Received in Office of Research _____

THE UNIVERSITY OF TENNESSEE

Application for Review of Research Involving Human Subjects

I. IDENTIFICATION OF PROJECT

1. Principal Investigator:

Jason S. Grindstaff
College: Education, Health & Human Sciences
Department: Exercise, Sport & Leisure Studies
HPER Building RM 144
Knoxville, TN 37996-2700
Office: 865-974-8768
jgrinds1@utk.edu

2. Faculty Advisor:

Leslee A. Fisher, Ph.D.
College: Education
Department: Exercise, Sport & Leisure Studies
HPER Building, Rm 336
Knoxville, TN 37996-2700
Office: 865-974-9973
lfisher2@utk.edu

3. Project Classification: Doctoral Dissertation Research Project

4. Project Title: Development and Validation of the Deaf Athletic Coping Skills Inventory

5. Start Date: Upon IRB Approval

6. Estimated Completion Date: April, 2007

7. External Funding: N/A

II. PROJECT OBJECTIVES:

In the past few decades the field of sport psychology has come to better understand the types of psychological skills characterized by able-bodied athletes (Gould, Finch, & Jackson, 1993; Gould, D., Guinan, D., Greenleaf, D., Medbery, R., & Peterson, K., 1999;

Gould, Jackson, & Finch, 1993a; 1993b; Scanlan, Stein, & Ravizza, 1991; Woodman & Hardy, 1998). There is limited sport psychology research that specifically addresses how and when disabled athletes use these psychological skills. Given the limited attention in previous research with disabled athletes this research study will draw specific attention to one particular group of disabled athletes, those who are deaf. Therefore, the proposed study will identify the types of psychological skills athletes who are deaf use during practice and competition.

III. DESCRIPTION AND SOURCE OF RESEARCH PARTICIPANTS

1. Participants:

The participants for the pilot study will be approximately 30-40 deaf athletes and certified interpreters recruited through a local center for the deaf (See Appendix I). These participants will be used to help determine the validity and reliability of the translated assessment. The participants for main study will be approximately 40 members of the USA Deaflympic team competing at the 2007 Deaflympics in Salt Lake City, Utah. All efforts will be made to include a repetitive sample (i.e., gender, race, age) of athletes from both the men's and women's athletic teams.

2. For the pilot study, the principal investigator will recruit participants from a local center for the deaf. Upon organizational agreement (See Appendix B) the principal investigator will leave recruitment forms at the front desk for potential participants to pick up. The potential participants can then contact the principal investigator at their convenience to learn more about the study. For the main study, the principal investigator will gain access to the participants by working collaboratively with the executive committee and head coaches from both the men's and women's athletic teams for the Deaflympics. Upon organizational agreement, potential coaches will obtain recruitment letters (See Appendix H) via e-mail or mail. The principal investigator will then have video conferences with members of the executive committee and possibly coaches in order to further discuss the nature of the study, time commitments involved and potential benefits of the study. Once consent has been granted by the director of the executive committee and meeting time and place with each of the head coaches and athletic teams will be determined.

3. Participant Selection:

For the purpose of the pilot study participants will be selected based upon two criteria. First, hearing participants must have interpreter certification through the Registry of Interpreters for the Deaf (RID). Second, deaf participants must be currently participating in sport or must have been a participant in sport in the past. During the main study, participants will be solicited during team meetings prior to the Deaflympics. Potential participants will then decide if they wish to take part in the study and will be asked to sign an informed consent form (See Appendix F). Participants will be reminded they are free to withdrawal from the study at any time. All assessments will be administered in group format according to team participation.

3. Criteria for selection and exclusion

Participants will be eligible for participation based upon the following criteria:

- (1) Pilot study participants who are hearing must hold either RID interpreting certification.
- (2) Pilot study participants who are deaf must have be currently participating in sport or have played sport in the past.
- (3) Main study participants must be eligible to complete in international sport competitions of the deaf.
- (4) Main study participants must be members of the 2007 USA Deaflympic team.

4. Number of Participants in the Study:

Approximately 30-40 participants will be involved in the pilot study while approximately 40 participants will be involved in the main study. .

5. Relationship between participants and primary investigator:

Efforts will be made to ensure that no prior relationship exists between the principal investigator and the participants in the study.

6. Incentives for Participation:

All participants will be asked to take part in this study on a volunteer basis. No compensation will be offered to any of the participants before, during, or after data has been collected.

IV. METHODS AND PROCEDURES

Upon organizational agreement from a local center for the deaf participants will be solicited on a volunteer basis. Pilot study recruitment forms will be available through the local center for the deaf. Potential participants will contact the principal investigator to volunteer for the study. At that point the principal investigator will explain the nature of the study and an agreed upon location for data collection will be determined.

Upon meeting, participants will be explained the purpose and procedures of the pilot study, and be asked to sign a statement of consent. Each participant will be reminded s/he is free to withdraw from the study at any time and that information discussed will remain confidential. Data collection for the pilot study will involve completing a sport psychology inventory (See Appendix C & D). The inventory contains demographic questions related to the participants' background and questions specific to their experiences in sport. Data collection will last approximately 20 to 30 minutes.

Approval for the main study will be granted through the Executive Board (See Appendix G) and head coaches associated with USA Deaflympic Team. Up approval the principal investigator and participants will meet at an agreed upon time and location in Salt Lake City, Utah prior to the 2007 Deaflympics (February 1-10). The participants will then be explained the purpose and procedures of the study, and be asked to sign a statement of consent. Each participant will be reminded s/he is free to withdraw from the study at any time and that information discussed will remain confidential.

The data collection procedures for the main study will involve completing a sport psychology inventory. The inventory contains demographic questions related to the participants' background and questions specific to their experiences in sport. Data collection will last approximately 20 to 30 minutes.

In order to protect the safety, anonymity, and confidentiality of each participant in the pilot and main study, all data collected will be kept for three years in a secure, locked file located at the following address: University of Tennessee, HPER Building Room 144, Knoxville, TN 37996. Only the principal investigator and the faculty advisor will have access to this material.

No identifying information, regarding research participants, will be revealed to coaching staff or executive committee. Any information requested by the coaching staff or executive committee will be discussed in terms of general trends across all participants.

V. SPECIFIC RISKS AND PROTECTION MEASURES

With the primary means of data collection coming from inventory responses, the principal investigator does not foresee any potential harm to the research participants. The nature of the study is a descriptive investigation to gain a better understanding of the psychological skills used by athletes who are deaf. All inventory questions will be stated in a way that will not solicit or require athletes to act in an unethical or immoral way. Upon completion of the inventory each participant who requests feedback will be provided such information regarding his/her responses.

VI. BENEFITS

The potential risks to the research participants are relatively minimal. The indirect benefits could include:

1. A better understanding of psychological aspect of sport.
2. Participants will potentially learn about the use of psychological skills in sport.

VII. METHODS FOR OBTAINING "INFORMED CONSENT" FROM THE PARTICIPANTS:

Upon agreement to participate in both the pilot study and main study, the principal investigator and participants will meet at an agreed upon time and location. At the beginning of the meeting the participant will be explained the purpose and procedures of the study, and be asked to sign a statement of consent. All Statement of Consent Forms will be stored in a secured, locked file at the following address: University of Tennessee, HPER Building Room 144, Knoxville, TN 37996.

VIII. QUALIFICATIONS OF THE INVESTIGATOR

The principal investigator has experience and training in quantitative methodological design and data analysis. To help ensure proper methodological design and analysis of data the investigators are working closely with his faculty advisor Dr. Leslee Fisher and a committee member Dr. John Lounsbury. Both faculty members have extensive training and experience with quantitative methodologies for the purpose of graduate student research supervision. In addition, the principal investigator has four years experience working with in and around the Deaf community. To facilitate the appropriate use of the assessment with athletes who are deaf a doctoral committee member, Dr. Jeffrey Davis, will provide his expertise in the area of educational interpreting and American Sign Language (ASL).

IX. FACILITIES AND EQUIPMENT TO BE USED IN THE RESEARCH

All data will be collected outside of UT facilities. As a result, all inventories will be complete on site at the 2007 Deaflympics in Salt Lake City, Utah. With the help of the Executive Board and team coaches a meeting facilities will be determined in order to collect data. Permission to use such facilities and necessary equipment (i.e., television, DVD player) will be approved in advance via the Deaflympic Executive Board (See Appendix B).

X. RESPONSIBILITY OF THE PRINCIPAL/CO-PRINCIPAL INVESTIGATOR(S)

By compliance with the policies established by the Institutional Review Board of The University of Tennessee the principal investigator(s) subscribe to the principles stated in "The Belmont Report" and standards of professional ethics in all research, development, and related activities involving human subjects under the auspices of The University of Tennessee. The principal investigator(s) further agree that:

- 1. Approval will be obtained from the Institutional Review Board prior to instituting any change in this research project.**
- 2. Development of any unexpected risks will be immediately reported to Research Compliance Services.**
- 3. An annual review and progress report (Form R) will be completed and submitted when requested by the Institutional Review Board.**
- 4. Signed informed consent documents will be kept for the duration of the project and for at least three years thereafter at a location approved by the Institutional Review Board.**

XI. SIGNATURES

ALL SIGNATURES MUST BE ORIGINAL. The Principal Investigator should keep the original copy of the Form B and submit a copy with original signatures for review. Type

the name of each individual above the appropriate signature line. Add signature lines for all Co-Principal Investigators, collaborating and student investigators, faculty advisor(s), department head of the Principal Investigator, and the Chair of the Departmental Review Committee. The following information should be typed verbatim, with added categories where needed:

Principal Investigator: _____ Jason S. Grindstaff _____

Signature: _____ **Date:** _____

Committte Chair & Faculty Advisor: _____ Leslee A. Fisher, Ph.D. _____

Signature: _____ **Date:** _____

Committee Member: _____ Craig A. Wrisberg, Ph.D. _____

Signature: _____ **Date:** _____

Committee Member: _____ Jeffrey Davis, Ph.D. _____

Signature: _____ **Date:** _____

Committee Member: _____ John Lounsbury, Ph.D. _____

Signature: _____ **Date:** _____

XII. DEPARTMENT REVIEW AND APPROVAL

The application described above has been reviewed by the IRB departmental review committee and has been approved. The DRC further recommends that this application be reviewed as:

☐ Expedited Review -- Category(s): _____

OR

☐ Full IRB Review

Chair, DRC: _____ Dr. Leslee A. Fisher _____

Signature: _____ **Date:** _____

Department Head: Dr. Joy D. DeSensi

Signature: _____ **Date:** _____

**Protocol sent to Research Compliance Services for final approval on
(Date):** _____

Approved:
Research Compliance Services
Office of Research
1534 White Avenue

Signature: _____ **Date:** _____

Appendix F: Organizational Agreement Form

Organizational Agreement Form

A research study is being conducted through The University of Tennessee, Knoxville, Department of Exercise, Sport & Leisure Studies. This study is being done in order to better understand the various kinds of psychological skills athletes who are deaf use during elite levels of competition. As the principal researcher for this study, I am requesting permission to recruit athletes through your organization and use your facilities as a resource to administer a sport psychology assessment to athletes prior to the Deaflympics in Salt Lake City, Utah in February, 2007. Prior to the Deaflympics a "Recruitment Letter" will be distributed to each of the head coaches in order to discuss the nature of the study. Coaches willing to allow their athletes to participate will meet with me and their team leading up to the Deaflympics in Salt Lake City, Utah in order to further discuss the nature of the study. At that point athletes willing to participate will sign an informed consent form and then individually complete an assessment in a group setting with other teammates. The assessment will require approximately 20 to 30 minutes to complete.

By signing this agreement form you consent your willingness for the principal investigator to use your facility for the administration of the sport psychology assessment. A copy of the information letter, "Recruitment Letter", is attached so that you can better understand the nature of the study. No additional time commitments or resources are necessary from you, your staff, or your facility. If you would like to contact me or my faculty advisor at the University of Tennessee to learn more about the study or if you have any questions please do not hesitate to contact us. We greatly appreciate you considering allowing us permission to use your facility to recruit participants.

Sincerely,

Jason S. Grindstaff, Principal Investigator
(865) 974-8768, jgrinds1@utk.edu

Leslee A. Fisher, Ph.D., Faculty Advisor
(865) 974-9973, lfisher2@utk.edu

Organization Name: _____

Signature: _____

Position: _____

Appendix G: Consent Form

Consent Form

The University of Tennessee, Knoxville Department of Exercise Sport & Leisure supports the practice and protection of human subjects participating in research. The information that follows is given so that you are aware of the nature of the study and can then decide if you wish to participate in this study. If you decide to participate in the present study, you are free to withdraw at any point during the course of the study without penalty.

This study is being conducted in order to address the use of deaf athletes' psychological skills. Your involvement will include the completion of a short demographic questionnaire and a survey. The survey will consist of questions about skills like goal setting, motivation, confidence, among others. The anticipated survey time length will be 20-30 minutes. With your participation in this study, it is hoped the information acquired can be used to help others interested in sport better understand deaf athletes can benefit from using mental skills training.

Although there are no foreseeable risks associated with involvement in this study, no compensation for physical injury or psychological distress will be provided from any person associated with the present study, including the University of Tennessee, Knoxville. However, you will have a formal opportunity at the end of the survey to express any concerns or questions you might have regarding any process that occurred before, during or after your participation in this study.

To ensure that your rights as a participant are maintained, the principal investigator will keep all records and data collected in a secure and confidential space located at the University of Tennessee. Any data collected over the course of your participation will be locked in a file with access granted to only the principal investigator and his faculty advisor. No individual results from this study will be used in formal write-ups or presentations; all results will be used to make general assumptions about the use of mental skills in deaf sport.

Your participation is solicited, but strictly voluntary. You will have a formal opportunity to express any questions or concerns following the completion of the interview. However, please feel free to contact the principal investigator or faculty advisor if there are any questions or concerns during any stage of your participation. Your cooperation is greatly appreciated and those associated with the present study thank you very much for your time.

Sincerely,

Jason S. Grindstaff
Principal Investigator
(865) 974-8768
jgrinds1@utk.edu

Leslee A. Fisher, Ph.D.
Faculty Advisor
(865) 974-9973
lfisher2@utk.edu

Participant's Name (Please Print) _____

Participant's Signature: _____ Date: ____/____/____

Appendix H: Recruitment Letter for Coaches

Recruitment Letter

A research study is being conducted through The University of Tennessee, Knoxville, Department of Exercise, Sport & Leisure Studies. This study is being done in order to better understand some of the psychological aspects of competing at the Deaflympics. The information that follows is given so that you are aware of the nature of the study and can then decide if you would like to provide the principal investigator access to your team leading up to the Deaflympics.

In order to qualify for this study participants must be athletes eligible to compete at the 2007 Deaflympics in Salt Lake City, Utah. The participant will be administered an assessment with 36 items statements and will require approximately 20 to 30 minutes to complete. All information acquired from the interview will remain confidential and only results from all assessments taken together will be discussed.

If you would like to obtain further information about this research study please feel free to contact me or my faculty advisor at your convenience. My contact information is listed below. Thank you for your time and your consideration in helping with this study in any way you can.

Sincerely,

Jason S. Grindstaff, Principal Investigator
University of Tennessee
Department of Exercise, Sport & Leisure Studies
(865) 974-8768
jgrinds1@utk.edu

Leslee A. Fisher, Ph.D., Faculty Advisor
University of Tennessee
Department of Exercise, Sport & Leisure Studies
(865) 974-9973
lfisher2@utk.edu

Appendix I: Recruitment Letter for Pilot Study

Recruitment Letter

A research study is being conducted through The University of Tennessee, Knoxville, Department of Exercise, Sport & Leisure Studies. This study is being done in order to better understand pilot test an inventory that measures the use of coping skills in athletes who are deaf. The information that follows is given so that you are aware of the nature of the study and can then decide if you would like to volunteer to participate in this study.

In order to qualify for this study you must meet one of two criteria. First, you must be a certified interpreter through Registry of Interpreters for the Deaf (RID). Two, you must be an individual who is deaf and is currently competing in sport or must have competed in sport in the past. During data collection you will be administered an inventory with 36 items statements and will require approximately 20 to 30 minutes to complete. All information acquired from the interview will remain confidential and only results from all assessments taken together will be discussed.

If you would like to obtain further information about this research study please feel free to contact me or my faculty advisor at your convenience. My contact information is listed below. Thank you for your time and your consideration in helping with this study in any way you can.

Sincerely,

Jason S. Grindstaff, Principal Investigator
University of Tennessee
Department of Exercise, Sport & Leisure Studies
(865) 974-8768
jgrinds1@utk.edu

Leslee A. Fisher, Ph.D., Faculty Advisor
University of Tennessee
Department of Exercise, Sport & Leisure Studies
(865) 974-9973
lfisher2@utk.edu

Appendix J: Tables

Table 1: ASL Version & Demographic Correlations (Pilot Study)

	Personal Coping Resources (PCR)	Conf.	Coach	Worry	Peak	Conc.	Goal	Cope	Deaf Sport
Sex	.155	.176	.278	.335	.128	.177	-.230	.166	-.055
Race	-.237	-.085	-.305	-.115	-.113	-.575(**)	.128	-.385	.109
Deaf Ed.	-.001	.023	.172	.143	-.065	-.600(**)	.263	-.115	.106
	.100	-.045	.067	-.184	-.050	.481(*)	.090	.287	-.133
GPA	-.173	-.061	-.174	-.384	.048	.473(*)	-.380	-.082	-.156
Comm Rating	.079	.176	-.161	-.005	.180	.581(**)	-.196	.037	-.090
	.616(**)	.605(**)	.322	.267	.439(*)	.143	.349	.382	.583(**)
Injury	.292	.274	.219	-.308	.087	.132	.444(*)	.058	.419

** Pearson product moment Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 2: English Version & Demographic Correlations (Pilot Study)

	Personal Coping Resource (PCR)	Conf.	Coach	Worry	Peak	Conc.	Goal	Cope	Deaf Sport
Sex	.094	-.170	.403	.126	-.208	.165	-.137	.264	.029
Race	-.341	-.038	-.480(*)	-.359	-.368	-.614(**)	.240	-.444	.150
Deaf Race	.281	.352	.184	.345	.087	-.722(**)	.491(*)	.330	.204
	.258	.152	.465	.161	.732	.001	.038	.181	.417
Ed.	-.055	.043	.005	-.367	.311	.469(*)	-.088	-.191	-.234
GPA	-.354	-.107	-.294	-.365	.242	.160	-.518(*)	-.376	-.264
Comm Rating	-.171	-.152	-.149	-.181	.058	.716(**)	-.417	-.414	-.168
	.519(*)	.664(*)	.262	.161	.445	-.067	.488(*)	.354	.353
Injury	.389	.583(*)	-.052	.093	.445	-.167	.515(*)	.250	.288

* Person product moment Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 3: ASL & English Correlations (Pilot Study)

	English: Personal Coping Resource	English: Conf.	English: Coach	English: Worry	English: Peaking	English: Conc.	English: Goal	English: Coping	English: Deaf
ASL: PCR	.910(**)	.736(**)	.503(*)	.529(*)	.516(*)	.371	.608(**)	.598(**)	.669(**)
ASL: Conf.	.755(**)	.690(**)	.348	.559(*)	.477(*)	.377	.394	.298	.621(**)
ASL: Coach	.729(**)	.567(*)	.905(**)	.552(*)	.113	-.063	.438	.827(**)	.321
ASL: Worry	.540(*)	.136	.549(*)	.761(**)	.125	.119	.123	.507(*)	.301
ASL: Peaking	.432	.390	.083	.213	.744(**)	.569(*)	.166	.057	.093
ASL: Conc.	.356	.211	.253	.122	.476(*)	.833(**)	-.185	.109	.166
ASL: Goal	.630(**)	.791(**)	.192	.138	.352	-.002	.937(**)	.311	.362
ASL: Coping	.653(**)	.356	.653(**)	.356	.330	.208	.365	.777(**)	.278
ASL: Deaf	.525(*)	.539(*)	-.081	.133	.216	.089	.540(*)	.213	.813(**)

** Pearson product moment Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 4: Confidence & Achievement Motivation Item-Total Statistics (Pilot Study)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ASL2	22.28	12.095	.201	.645	.611
ASL8	22.17	10.147	.692	.681	.485
ASL12	22.50	11.676	.030	.629	.723
ASL24	22.11	12.458	.290	.786	.591
English2	22.44	10.026	.451	.806	.534
English8	22.11	9.752	.770	.909	.460
English12	22.17	12.382	.204	.656	.608
English24	22.33	12.118	.253	.532	.597

Table 5: Paired Sample t-tests (Pilot Test)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	SD	SEM	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	ASL: Concentration – English: Concentration	.0000	.3737	.0881	-.18587	.18587	.000	17	1.000
Pair 2	ASL: Goal Setting – English: Goal Setting	-.0277	.2956	.0696	-.17481	.11925	-.39	17	.695
Pair 3	ASL: Coping – English: Coping	.0972	.4124	.0972	-.10790	.30234	1.00	17	.331
Pair 4	ASL: Confidence – English: Confidence	.0000	.4022	.0948	-.20001	.20001	.000	17	1.000
Pair 5	ASL: Peaking – English: Peaking	-.1250	.3561	.0839	-.30211	.05211	-1.489	17	.155
Pair 6	ASL: Freedom – English: Freedom	-.1388	.5571	.1313	-.4159	.13819	-1.058	17	.305
Pair 7	ASL: Coachability – English: Coachability	-.0138	.2639	.0622	-.14513	.11735	-.223	17	.826
Pair 8	ASL: Deaf – English Deaf	-.0521	.2952	.0696	-.19896	.09472	-.74	17	.464

Table 6: Main Study Descriptive Statistics for DACSI-36

	Mean	Standard Deviation	Variance	Skewness		Kurtosis	
					Std. Error		Std. Error
Confidence	3.45	.445	.198	-1.598	.393	4.786	.768
Coachability	3.26	.653	.427	-1.375	.393	2.254	.768
Freedom From Worry	2.58	.964	.929	-.725	.393	.570	.768
Peaking Under Pressure	3.09	.614	.376	-.679	.393	-.514	.768
Concentration	3.10	.512	.262	.116	.393	-1.022	.768
Goal Setting & Achievement Motivation	2.97	.613	.376	.047	.393	-.698	.768
Coping With Adversity	3.06	.658	.433	-.196	.393	-.955	.768
Deaf Sport & Communication	2.91	.575	.330	-.032	.393	-1.093	.768

Table 7: Main Study Reliability Statistics for DACSI-36 Factor Scales

	Scale Mean	Standard Deviation	Cronbach's Alpha
Goal	2.96	.184	.629
Conf.	3.46	.063	.525
Coach	3.26	.161	.626
Worry	2.58	.230	.827
Peaking	3.09	.070	.742
Conc.	3.10	.319	.439
Coping	3.06	.184	.740
Deaf	3.99	.409	.259

Table 8: Main Study Item-Total Correlations for the DACSI-36 Deaf Sport Factor Scale.

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
28) If I compete in sport with teammates that do not know ASL I often feel frustrated because of problems communicating with them.	.468	.761
30) It concerns me if I compete in sports with teammates who are hearing.	.609	.593
35) If I were to play on a team with mostly all hearing players it would bother me.	.615	.590

Table 9: Main study dependant PCR scores based on sport type.

Sport	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Alpine Skiing	108.143	5.281	97.386	118.900
Curling	109.444	4.657	99.958	118.931
Ice Hockey	112.267	3.608	104.918	119.615
Snowboarding	106.400	6.249	93.672	119.128

Table 10: Main study descriptive statistics for sport and DACSI-36 factor scales.

Sport		Confidence	Coach	Worry	Peak	Concentration	Goal	Coping	Deaf Sport	PCR
Alpine Skiing	Mean	3.21	3.36	3.29	2.54	2.93	2.64	3.04	2.94	108.14
	Std. Dev	.172	.537	.567	.529	.515	.497	.783	.684	6.842
Curling	Mean	3.66	3.08	2.28	3.14	3.25	2.89	3.25	2.78	109.44
	Std. Dev	.35	.87	1.28	.75	.65	.65	.80	.44	19.53
Ice Hockey	Mean	3.53	3.45	2.55	3.27	3.05	3.12	2.92	3.08	112.27
	Std. Dev	.311	.356	.683	.513	.445	.619	.548	.503	8.259
Snowboarding	Mean	3.20	2.85	2.25	3.25	3.25	3.10	3.15	2.60	106.40
	Std. Dev	.891	.962	1.237	.354	.468	.652	.602	.804	22.131
Total	Mean	3.46	3.26	2.58	3.09	3.10	2.97	3.06	2.91	109.94
	Std. Dev	.445	.653	.964	.613	.512	.613	.658	.575	13.539

Table 11: Main study sport and factor scale pairwise comparisons.

Dependent Variable	(I) Sport	(J) Sport	Mean Difference (I-J)	Std. Error	Sig.(a)	95% Confidence Interval for Difference(a)	
						Lower Bound	Upper Bound
<i>Confidence Freedom From Worry Peaking Under Pressure</i>	Curling	Alpine Skiing	.452(*)	.213	.041	.019	.886
	Alpine Skiing	Curling	1.008(*)	.468	.039	.054	1.962
	Curling	Alpine Skiing	.603(*)	.287	.044	.019	1.188
	Ice Hockey	Alpine Skiing	.731(*)	.261	.008	.200	1.262
	Snowboarding	Alpine Skiing	.714(*)	.333	.040	.035	1.393

Based on estimated marginal means

* The mean difference is significant at the .05 level.

a Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

VITA

Jason S. Grindstaff earned his B.A. degree from Dakota Wesleyan University in Mitchell, South Dakota in the spring of 2001. While at DWU he earned a double major in Psychology and Sports Medicine. He has two masters degrees from the University of Tennessee in Human Performance & Sport Studies and Mental Health Counseling; earned in 2002 and 2004, respectively. In the Fall of 2004 Jason began his doctoral studies under the direction of Dr. Leslee A. Fisher. His research interests include deaf sport, psychological response to sport injury, and the use of hypnosis in applied sport psychology. In May, 2007 Jason completed his doctoral studies in Sport Studies with a concentration in Sport Psychology. For further information please contact Jason via e-mail at jgrindstaff@yahoo.com.