

THE UNIVERSITY OF MANITOBA

**THE EFFECTS OF SELF-TALK ON SKILLED FIGURE SKATERS' JUMPING
PERFORMANCE AND CONSISTENCY**

By

Deanna Betteridge

A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
In partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

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Abstract

The effects of self-talk on skilled figure skaters' jumping performance and consistency

Self-talk (ST), a cognitive strategy, is a skill commonly used by applied sport psychology consultants to enhance skill acquisition, athletic performance, and concentration, and as a means of changing bad habits and improving emotional control in athletes (Martin, 1997). Task-specific or instructional ST packages have been shown to be effective in enhancing the performance of figure skaters' compulsory figure performance (Ming & Martin, 1996; Palmer, 1992), and free skate performance (Garza & Feltz, 1998). To date, no studies have examined an abbreviated ST strategy, ST and walkouts, and its effects on figure skaters' jumping performance. As figure skating competitions are infrequent, and no longer focus on compulsory figures, the consistency in which the skater is landing a particular jump during free skate is of vital importance to the success of the skater. Therefore, the purpose of this study was to examine whether ST was an effective performance enhancement strategy for improving figure skaters' jumping performance and consistency. A single-subject multiple-baseline design across three female novice level figure skaters was used to examine the effects of an individualized instructional ST strategy, developed by the skater, coach, and researcher. Results demonstrated that this method was not effective in enhancing jumping performance of the three skilled figure skaters. The results from the social validity questionnaire indicated that the athletes and coach felt that the ST strategy was at least somewhat helpful at improving jumping performance and consistency and supported the use of the ST strategy. The participants felt that the study procedures sometimes interfered with their practice schedule/routine and that the ST strategy was sometimes too much to think about.

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Athletes of all levels make use of a variety of training methods to get closer to their athletic potential, and gain an advantage over the competition. Athletes are employing a variety of sport science professionals, such as biomechanists, physiologists, nutritionists, and sport psychology consultants, to help design the optimal training program for their success. Coaches and athletes are more aware than ever before that thoughts and emotions affect athletic performance and that the body and mind cannot be separated in sporting performance (Finn, 1985). An exceptionally trained athlete may “lose it” in a competition if they have not learned how to control their thoughts and focus during a competition. With so many hours spent training the physical and technical aspect of sport, it makes no sense to leave the mental skills to chance (Martin, 1998).

Sport psychology consultants use a variety of psychological interventions with athletes to train, and control their mental focus and concentration during practice and competition. Self-talk (ST) is a cognitive strategy commonly used to help athletes maintain focus and concentration when practicing and performing. ST or key words can be used to prompt correct timing, position, and rhythm during the execution of a movement skill, and to help the athlete perform more consistently under the stress of competition (Martin, 2000). The better rehearsed and consistently used an athlete's ST is, the more likely that athlete will maintain concentration and consistency when performing under stressful situations (Martin, 2000). It is also clear that different types of ST are required to help each individual stay in control of their thought content and concentration.

Research in the field of sport psychology has found ST to be effective in improving performance in tennis (Ziegler, 1987; Landin & Hebert, 1999), soccer (Johnson, Hrycaiko, Johnson, & Halas, 2004; Papaioannou, Ballon, Theodorakis, &

Auwelle, 2004), speed skating (Wanlin, Hrycaiko, Martin, & Mahon, 1997), cross-country skiing (Rushall, Hall, Roux, Sasseville, & Rushall, 1988), swimming (Rushall & Shewchuk, 1989), basketball (Theodorakis, Chroni, Laparidis, Bebetos, & Douma, 2001; Perkos, Theodorakis, & Chroni, 2002), water-polo (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004), golf (Boutcher & Crews, 1987), and figure skating (Palmer, 1992; Ming & Martin, 1996). Most of the applied sport psychology research using athletes has been based on the application of contrived ST packages. While there is plenty of research documented on contrived ST strategies, research looking at the application of individual ST packages, typically the way sport psychology is practiced, is lacking. As more athletes are turning to sport psychology consultants to help train and prepare their mental focus, it seems imperative that more research be focused on how practicing sport psychology consultants are working with athletes.

Characteristics of Successful Athletes

A series of research studies (e.g., Orlick & Partington, 1988; Mahoney & Avenier, 1977; Highlen & Bennett, 1983) have been conducted to identify mental strategies, skills, and techniques that differentiate elite athletes who perform consistently at their potential in competition from elite athletes that perform inconsistently or below their potential at competition. Research in this area has been reported with athletes from many different sports, including wrestling, diving, tennis, lacrosse, gymnastics, and figure skating. The information collected from this research should be used with caution as the definition of successful and unsuccessful athletes has been inconsistent, and typically the unsuccessful athletes are still performing at a level superior to the average athlete. The results from this research provide the practicing sport psychology consultant with general themes to guide

the development of psychological strategies in helping their athletes perform consistently and closer to their potential.

One of the first studies to explore these differences in psychological aspects between successful and unsuccessful athletes was completed with the 1976 U.S. men's gymnastics team (Mahoney & Avenier, 1977). Successful athletes were defined as those that qualified for the Olympic team, and unsuccessful athletes were those that did not qualify. It was found that qualifiers were more self-confident, had more gymnastics related dreams, used internal imagery, and reported more instructional ST during training and competition than the nonqualifiers.

Senior U.S. National champion figure skaters (Gould, Finch, & Jackson, 1993) and Olympic wrestlers (Gould, Eklund, & Jackson, 1992) both reported thought control strategies, rational thinking and ST as part of their pre-competitive mental preparation and stress-coping strategies. Olympic wrestlers recalled ineffective cognitions, such as a lack of focus and task-irrelevant thoughts during their worst Olympic matches.

In general, the studies have shown that successful elite athletes are characterized by a greater use of positive task-relevant thoughts and decreased irrelevant thoughts, higher levels of confidence, greater use of stress-coping strategies such as positive ST and rational thinking, quality training, competition focus plans, more sport related dreams, controlled focus, use of detailed mental and physical preparation plans, and less negative anxiety (Highlen & Bennett, 1983; Mahoney, Gabriel, & Perkins, 1987; Orlick & Partington, 1988; Heishman & Bunker, 1989; Gould et al., 1993; Defrancesco & Burke, 1997; McPherson, 2000).

One strategy that practitioners use to help athletes control their thoughts, focus, and to help deal with stress is ST. Specifically, task-specific ST can be used in practice and competition to help the athlete focus attention on task-relevant thoughts that are important to the execution of the skill. The athlete who is able to control his or her thoughts by focusing on the task at hand, rather than thinking about the past or worrying about the future, is more likely to perform optimally (Mallett & Hanrahan, 1997).

Self-Talk

ST is a cognitive strategy commonly used by applied sport psychology practitioners when working with athletes of all levels. ST is what you say or think to yourself, either out loud or privately. Generally, it is believed that when we focus our mind on a specific thought it would directly influence the corresponding behavior or action. Our mind is continually working throughout the day, and it is how we control these thoughts that will determine our behaviors. ST is commonly used to enhance skill acquisition, athletic performance, concentration, and as a means of changing bad habits and improving emotional control (Handschin, 1995; Martin, 1997; Johnson et al., 2004).

ST can be grouped into different categories depending on the intended nature of its influence. Mood words are used to help an athlete control and elicit the desired emotions and level of intensity for performing a task. Mood words are intended to increase the mechanical capacities of the performance (Rushall et al., 1988). Task-specific or instructional ST is used for skill development and performance to prompt particular body positions and techniques specific to each skill. Task-relevant ST enhances the mechanical efficiency of the motor movements being performed (Rushall et al., 1988). Motivational ST refers to statements related to confidence building, effort input

and positive moods (Hatzigeorgiadis et al., 2004). Positive ST enhances athletic performance by triggering desired actions, emotions, and to increase effort, whereas negative ST includes anxiety-producing inappropriate thoughts that get in the way of optimal performance.

ST can also be used to help an athlete transfer a behavior from practice to the competitive environment by providing common stimuli between environments. By bringing a behavior under the control of specific ST in practice, and then transferring that ST to competition, the behavior is more likely to transfer successfully (Martin, 2003). This is a very important and practical component of ST, because after many hours practicing a skill the true test of athletic performance comes during competition.

It was once believed that thinking itself was problematic to performance, but it is now more clearly understood to be improper thinking that disrupts performance (Martin, 1997). As practitioners in the field of applied sport psychology, it is important for us to help athletes be aware of what they are thinking and learn to control these thoughts during performance.

Research on Self-Talk

Generally, there is evidence that the use of ST prior to performing a skill can positively influence skill acquisition (Ziegler, 1987; Ming & Martin, 1996; Garza & Feltz, 1998), and may also lead to improvements of previously learned skills (Rushall et al., 1988; Rushall et al., 1989; Landin & Hebert, 1999; Johnson et al., 2004).

Many studies have shown the positive effects of a contrived or generic instructional ST strategy on athletic performance (Ziegler, 1987; Landin & Hebert, 1999; Theodorakis et al., 2001; Johnson et al., 2004; Papaioannou et al., 2004). Fewer studies

have looked at the effects of an individual ST strategy developed for the athlete (Palmer, 1992; Ming & Martin, 1996; Patrick & Hrycaiko, 1998; Garza & Feltz, 1998; Rogerson & Hrycaiko, 2002).

Ziegler (1987) found the use of instructional ST “Ball, Bounce, Hit, Ready” by novice tennis players to significantly improve the number of forehand and backhand returns. Rushall et al. (1988) assessed the effects of task-relevant statements, mood words, and positive self-statements on the National cross-country ski team performances. With such high performance athletes, the performance improvements of 3% in each of the three ST conditions reinforced the value of controlling thought content in athletes of all levels. It was found in a laboratory study assessing the effects of a motivational ST versus instructional ST on four different tasks, that both types of ST were effective. Specifically, tasks that required accuracy, precision, and fine motor coordination were more positively effected by instructional ST, while tasks that were more strength and endurance based were equally effected by motivational and instructional ST (Theodorakis, Weinberg, Natsis, Douma, & Kazakas, 2000). The authors recommended future researchers allow individuals to choose specific ST cues that work best for them. Hatzigeorgiadis et al. (2004) reported that novice water polo players using instructional ST improved performance more when performing a precision task, and players using motivational ST showed a greater improvement in the power task.

ST can also be used to correct well-learned behaviors of skilled athletes. Landin and Hebert (1999) used a ST strategy designed to correct a movement deficiency in skilled tennis players. Using the key words “Split-Turn” they found that the strategy was effective in correcting movement pattern errors of these athletes in their natural

environment. Participants felt that the ST led to a greater sense of confidence in being successful at the net. In replicating the work of Landin and Hebert (1999), Johnson et al. (2004) used a two-word ST intervention of “down-lock” in the performance of skilled soccer player’s low-drive shot. The study showed that the ST sequence was effective in two of the three participants, and that the participants believed the ST helped them focus their attention on relevant cues and increased their confidence in the low-drive shot.

The use of ST with other treatment techniques has been shown to be effective in improving performance in skilled athletes (Kendall, Hrycaiko, Martin, & Kendall, 1990; Beauchamp, Halliwell, Fournier, & Koestner, 1996; Patrick & Hrycaiko, 1998). When reviewing studies that involve more than one treatment modality it is difficult to assess whether any behavioral improvements are a result of ST, the other technique(s), or a combination of multiple components. An area of future research would be to examine the effects of each component individually. A multi-component package of goal-setting, self-monitoring, ST, feedback, and goal visualization was effective in influencing speed skaters to work harder, show less off-task behaviors and increase performance times (Wanlin et al., 1997). Thelwell and Maynard (2003) found that a mental skills package was effective at enhancing performance consistency and actual performance. The repeatable good performance of cricketers was evaluated with the instruction of a package including goal-setting, ST, arousal control, mental imagery, and concentration.

Ming and Martin (1996) used a detailed ST package during on-ice and off-ice practice of young figure skaters compulsory figures. The instructional key words were developed by the skater, coach, and researcher prior to the treatment phase, and then practiced and memorized by the skater. Using a multi-element design they found that all

four participants showed an increase in performance of the treated figure and continued to use the ST strategy at a one-year follow-up. Garza and Feltz (1998) examined the effects of two mental practice techniques, paper freestyle drawing and walk through on the floor, compared to a stretching control group with competitive figure skating routines. Using a pre- and post-measure evaluation they found that both mental practice techniques showed significant performance and confidence improvements compared to the control group.

The detailed reviews above are specific to the present research study. The present study closely replicated the development of the ST sequence from Ming and Martin (1996) and Garza and Feltz (1998), and the delivery and use of the ST sequence from Landin and Hebert (1999) and Johnson et al., (2004). This study used an abbreviated ST package, where there are no other mental skills incorporated, but the participants do use a walkout of the jump while rehearsing the ST or key words prior to five jump attempts during the intervention phase. The participants also performed three walkouts at the initial intervention meeting to determine that they knew when to say the ST or key words in relation to actually setting up and performing the jump. This gave the participants and coach the opportunity to revisit when and what they were saying and to confirm that the participant was comfortable using the ST strategy.

Rule-Governed Behavior

The use of ST as an effective strategy to control behavior is typically seen as an example of contingency-learned behavior or rule-governed behavior. The differences between contingency-learned and rule-governed behavior lie in the nature that they are strengthened and the use of consequences. Contingency-learned behavior is strengthened

gradually through trial and error and involves the use of immediate consequences, whereas rule-governed behavior leads to immediate behavior change and involves delayed consequences (Martin, 2003). ST, as used in this particular study just prior to the jump, is meant to function as a partial rule, controlling the subsequent behavior through the use of rule-governed behavior. Correct use of rules can produce behavior change much more rapidly than other behavior modification strategies such as; shaping, chaining, or trial and error experiences with reinforcers and/or punishers (Martin & Pear, 1999; Hayes, 1989).

A rule functions as a statement that a specific behavior will pay off in a particular situation, more specifically that performing the behavior specified in the rule will lead to the reinforcer identified in the rule (Martin, 1997). Key words used in ST are capitalizing on the use of partial rules, as they do not fully identify all three aspects of the rule (i.e., antecedent, behavior, and consequence). Various types of instructional ST serve as partial rules when controlling subsequent behaviors. For example, when a figure skater is consistently dropping her right shoulder during take-off of the triple-toe jump - the rule would be that if she holds her shoulders square during take-off she would have a more effective take-off and then a more successful jump attempt. Saying a rule this long before a jump is not realistic or effective, and therefore the skater might chose to say "Square" before setting up her take-off. The key word "Square" would cue the figure skater to hold her shoulders square and should increase the chances that she will perform the jump successfully.

Nature of figure skating

Figure skating is an aesthetically powerful sport that can be done by females and males and is broken down into singles, pairs, and synchronized skating. Figure skating is a judged sport, where a panel of judges determines the scores given to each competitor. Within singles figure skating there are five different competitive skill levels that are based on proficiency tests: juvenile, intermediate, novice, junior, and senior. Each level draws on similar techniques but adheres to increasingly more difficult skills as well as different rules and guidelines. Elite figure skaters practice 5 to 10 times a week depending on their age and level. Figure skaters practice on an ice surface that can have up to 25 other figure skaters practicing at the same time, which can be very distracting and frustrating as there is limited ice surface.

Figure skating jumps, especially doubles and triples, require excellent balance, timing, and a lot of strength to successfully land. When skaters learn a new double or triple jump it may take only weeks to successfully master or up to a couple of years before the skater has gained the strength, timing, technique, and confidence to perform the jump successfully. Trying to master a double or triple jump is very difficult and results in many natural punishers and reinforcers throughout the process. The natural punishment of falling hard when repeatedly attempting a difficult jump can be very discouraging and painful for the figure skater. The natural reinforcer present in figure skating is the incredible feeling of successfully landing a jump that you have been working so hard on. When trying to master a double or triple jump the skater will experience many opportunities of punishment, with the opportunity for reinforcement being very inconsistent. Once the skater feels that they have mastered the jump they still

have to work very hard to be successful, as learning and mastering the jump does not guarantee success as the difficulty still remains.

The participants in this study chose the Double Axel and Double Lutz jumps as their target jumps, both very difficult and challenging jumps. The Axel jump is one of the most difficult jumps which takes off from the forward outside edge and is landed on the back outside edge of the opposite foot. A Double Axel jump is 2 _ rotations in the air before landing. The Lutz jump is a toe pick assisted jump, taken off from a back edge and landed on the back outside edge of the opposite foot. A Double Lutz jump is 2 rotations in the air before landing.

Figure skating research

In my search for ST literature I was able to find seven published studies using figure skaters and one unpublished Master's thesis. One of the studies was done on coaching effectiveness in figure skating (Hall & Rodgers, 1989), and therefore not specific to figure skaters use of ST, a second was a comment paper (Martin, 1993) written in response to an earlier study, and another was a self-monitoring package for improving free skate practice behaviors (Hume, Martin, Gonzalez, Cracklen, & Genthon, 1985). Research examining figure skaters use of ST is lacking in the field of sport psychology, specifically their use of ST when applied to the performance and execution of jumps.

Gould et al., (1993) conducted a study to explore the stress-coping strategies used by 17 of 20 U.S. National champion figure skaters between 1985 and 1990. Coping strategies identified included the use of rational thinking and ST, positive focus and orientation, social support, time management and prioritization, precompetitive mental

preparation and anxiety management, and training hard and smart. The results of this study, while not directly assessing their use of mental skills, show that elite figure skaters find it helpful to use ST and mental preparation when dealing with the stressors of being a national champion.

Two studies were conducted assessing the effects of a ST package using compulsory figure performance as the dependent variable. Palmer (1992) compared two different mental practice techniques in conjunction with the skaters' regular on-ice training schedule to a no-treatment control group. The Martin ST technique had the skaters practice their selected key words during on-ice practices and while they were walking through the figure on the floor. The paper patch technique had the skaters say the key words out loud while tracing over the figure on a piece of paper. A pre- and post-measure evaluation found the paper patch technique improved performance significantly over the control group and the Martin ST technique. The author recommended that the application of psychological skills not only be applied in a practical and convenient manner, but also be relevant to specific sport activities. Ming and Martin (1996) found that using a single-subject design to examine a ST package incorporating the planning and memorizing of key words and off-ice walk-outs of the figure and ST was effective in improving the performance of young figure skaters' compulsory figures. They included adequate procedural reliability assessments to ensure that the treatment was being delivered and used as indicated. While these studies are helpful in illustrating the impact of self-talk on figure performance, compulsory figures are no longer being used, and therefore more studies need to be conducted focusing on the effects of ST during free skate.

Garza and Feltz (1998) attempted to replicate and adapt the studies of Palmer (1992) and Ming and Martin (1996) to figure skaters' free skate performance, ratings of self-efficacy, and competition confidence. The use of paper freestyle drawing and walk through on the floor were applied to freestyle skating routines of 27 female competitive figure skaters and compared to a stretching control group. Detailed outlines were included to ensure that all components of the study were used correctly. They found that both mental practice techniques showed improvements compared to the control group on ratings of jumping and spinning ability, and competition confidence. The studies described used ST in combination with other practice techniques, such as walkouts and paper drawings, and it is therefore difficult to conclude with any certainty the role of ST in the performance improvements.

Single-Subject Design

The use of single-subject designs in applied sport psychology research has been recommended for many reasons. The specific, detailed, repeated, and ongoing measurement of athletic performance provides valuable information to coaches and athletes on individual variation in performance, as compared to just a pre- and post-treatment measurement (Martin & Hrycaiko, 1983; Hrycaiko & Martin, 1996; Wanlin et al., 1997). The nature of athletic performance is that it changes over time, and using a measure that highlights that uniqueness of sport is very helpful when trying to establish performance change due to an intervention. Each participant serves as their own control and therefore eliminates the need for a no-treatment control group as each participant receives the treatment at one time or another, making it very appealing to coaches and athletes. It also eliminates the problem of group averages, which may obscure individual

improvements that are significant to athletes (Bryan, 1987). Single-subject designs emphasize the use of social validation procedures to assess how the participants themselves feel about the treatment and results of the study (Hrycaiko & Martin, 1996). Although data are analyzed following visual inspection guidelines, behavioral researchers are typically more concerned with the athlete's and coach's own assessments on whether the performance improvements were significant to them (Bryan, 1987).

Single-subject designs typically involve three phases: baseline, intervention, and follow-up. The baseline phase involves monitoring of the target behavior to determine initial levels or frequency of the behavior prior to the intervention, and is then used to determine if any behavior change occurs after intervention. Stable baselines, or those which move in the direction opposite to improvement, provide a better basis for attributing change to the effects of treatment (Parsonson & Baer, 1978). The intervention phase involves the monitoring of the target behavior while the intervention procedures are applied sequentially to each participant. In the multiple baseline across individuals design the first participant is given the intervention when his or her baseline is stable or in a direction opposite to that of the hypothesized behavior change. The other participants remain at baseline until the intervention is sequentially applied to each remaining participant. The behavior of the participant(s) controls the pace and procedures of the programs through the data, which are continuously available to the experimenter when graphed after each session (Parsonson & Baer, 1978). When behavior change occurs only when the intervention is applied then the particular intervention is considered effective. Individual behavior change during the treatment phase is compared to his/her baseline performance to determine the significance of the change. The experimenter is attempting

to show that he has a reliable experimental variable, in that each behavior changes maximally only when the experimental variable is applied to it (Baer, Wolf, & Risley, 1968). The follow-up phase is necessary to determine whether the behavior change has had any lasting effect following termination of the program (Martin & Pear, 1999).

Social validation is the clinical or practical assessment of the treatment procedures and results from the practical and/or social importance of the behavior change to the participant (Martin & Pear, 1999). Social validation assesses how the participants themselves feel about their experience in the study, the methods used, and the results of the study. In essence social validation is the researcher's form of a customer satisfaction questionnaire. A social validity questionnaire should address these three questions: (Hrycaiko & Martin, 1996)

1. To what extent are the target behaviors identified for treatment programs really the most important for the client and/or society?
2. Are the particular procedures used acceptable to the client, especially when alternative procedures might be available to accomplish approximately the same results?
3. Are the consumers of programming (the clients and/or their caretakers) satisfied with the results obtained?

Replication of treatment effects determines whether or not a certain procedure was responsible for a corresponding behavior change (Baer et al., 1968). Procedural reliability ensures that the intervention was applied as intended (Martin, Thompson, & Regehr, 2004). Treatment integrity and research replicability are enhanced when steps are taken to ensure procedural reliability. Two external observers independently recording

the dependent variable, and/or independently recording whether the procedures are being followed as intended are two common ways to ensure procedural reliability. An interobserver reliability (IOR) assessment is then done to determine if their assessments are comparable. IOR estimates can be calculated by dividing the smaller number (Observer A) by the larger number (Observer B) and multiplying it by 100%. For example, if Observer A scores five consecutive jumps of a skater on a 1 to 6 point scale and assesses and scores the skater as 2, 4, 6, 3, 1 – the total score is 16, and the average score is 3.2. If Observer B scores the skater as 3, 4, 6, 3, 2 – the total score is 18, and the average score is 3.6. To assess IOR, $(3.2 / 3.6) \times 100\% = 88\%$. Generally, an IOR greater than 80% is considered acceptable (Kazdin, 1977). Therefore, we are confident that the data recorded on the individual is reliable. Treatment integrity checklists are another form of procedural reliability to enhance the validity of the treatment.

Self-Talk guidelines

Well-planned ST and/or key words that have been carefully selected, applied, and practiced for a particular skill can help athletes remain focused on the key elements of the skill. If athletes do not practice positive task-relevant thoughts they are leaving it to chance that negative task-irrelevant thought may enter their mind and distract them from performing the task at hand (Martin, 1998).

When developing ST and/or key words Martin (1997) and Landin (1994) have suggested some guidelines to follow: focus on what he/she wants to do, not what he/she does not want to do; use key words to prompt specific positions or movements in order to perform the skill properly; use ST just before executing a skill in practices and competitions, in order to help transfer that skill from practice to competition; too much

ST can cause paralysis by analysis; use concise phrases, one or two words; be logically associated with the task; be explicit; and should consider the nature of the task (i.e., speed, open, closed, etc). Generally speaking, the key words should be short, vivid and positively phrased to yield maximum benefits (Moran, 2004). After the key words have been selected it is recommended that they be continually practiced and refined for an athlete to perform to potential on a consistent basis (Orlick & Partington, 1988).

The role of the sport psychology consultant in the development process is not to tell the athlete what to do but to equip them with the practical tools and skills required to use psychological skills in practice (Ravizza, 2001). Key words should be athlete-specific as each athlete is unique and will likely require different key words for cognitive control and to prompt the specific movement patterns required for successful performance (Gould et al., 1992; Henschen, 2001).

The development of a ST strategy and selection of key words should fit the nature and speed of the skill, without disrupting the natural flow of executing the skill. If the athlete employs too many key words to focus on they are at risk for paralysis by analysis, and ultimately a decrease in performance. It is also recommended that coaches and athletes work together to develop individual ST focusing plans for the athlete (Orlick & Partington, 1988; Gould et al., 1992; Defrancesco & Burke, 1997). Coaches have extensive knowledge and experience that can be applied to the process of developing the key words with the athlete.

Statement of the Problem

A review of the literature has shown that successful elite athletes make consistent use of task-relevant instructional ST more frequently than their less successful

counterparts, and that national level figure skaters use ST as part of their competition mental preparation. ST can be used to positively influence skill acquisition and athletic performance, to enhance concentration and motivation, and as a means of changing bad habits in a variety of sports. Specifically, instructional ST was shown to be effective in enhancing performance of novice tennis players, competitive figure skaters, and very elite cross-country skiers. A recommendation is to allow athletes to come up with their own ST as they feel that it maximally pertains to their specific sport and situation.

ST research in figure skating has been very limited, with an emphasis on improving compulsory figure performance with the use of a ST package. Competitive figure skaters no longer compete with compulsory figures, and therefore there is a need for studies examining the other areas of competitive figure skating. To date, no studies have specifically examined an individual abbreviated ST package and its effects on figure skaters' jumping performance and consistency. As figure skating competitions are infrequent, the consistency to which the skater is landing a particular jump is of vital importance to the success of that skater.

Therefore, the primary purpose of this study was to examine whether ST was an effective performance enhancement strategy for improving figure skaters' jumping performance and consistency.

Objectives

1. To examine the effects of an individually developed instructional ST strategy on figure skating jump performance.
2. To examine the effects of the ST strategy on the consistency of jumping performance.

3. To assess whether skaters and coaches are capable of developing their own effective ST strategy as recommended in the applied literature.
4. To enhance the ST literature by examining the effects of ST on the performance of figure skating jumps.
5. To explore the effectiveness and capability of skaters to self-assess and score their own jumping performance.

Method

Participants

Initially five female figure skaters, and their respective coaches, that met the general inclusion criteria (shown below) volunteered to participate in the study. Due to extenuating circumstances participants 4 and 5 had to withdraw from the study, and therefore their results are not presented here. The general criteria for participation in the study were:

- Competitive figure skater for more than 3 years
- Taking part in a summer figure skating school in Winnipeg or surrounding area
- Be working on a double or triple jump – landing it inconsistently (i.e., approximately one out of every five attempts)
- Have been working on the particular jump for at least 2 months
- Have not had any formal one-on-one experience with sport psychology services

The data presented in this study is for three competitive novice-level figure skaters who participated in the duration of the study. The participant and coach chose

the target jump for their participation in the study, a jump they were familiar with but had not yet mastered. Participants 1 and 2 were 16 and 15 years of age respectively and the target jump for both was the Double Axel. Participant 3 was 17 years of age and the target jump was the Double Lutz.

Informed Consent

At the initial introductory meeting informed consent was given by all three participants, their parents/guardians, and coach (Appendices B, C & D). The researcher explained the study procedures and answered any questions that the participants had (Appendix A).

Experimental Design

A single-subject multiple-baseline across individuals design was used to examine the effects of the ST intervention strategy on jumping performance and consistency. Baseline measures of the dependent variable were taken at the beginning of most free skate sessions that the participant attended. The intervention was introduced to participant 1 after she had achieved a stable baseline, prior to session #23. The remainder of the participants received the intervention in a sequential fashion following the first participant. Participant 2 was intervened on prior to session #36, and participant 3 was intervened on prior to session #42.

Dependent variables

The DV was the jumping performance and consistency of the target jump that the skater and coach had indicated as meeting the criteria. Skater's self-assessed their jumping performance after each of the five attempts. The coach and/or researcher periodically observed and scored the skaters' jumping performance using the same

scoring procedures. Jumping performance for a given session was expressed as an average of the five attempts made during a session. The scores were based on a 6-point scale (Appendix E), summed and then divided by five to give the average score. The average score for each session, as scored by the skater, was plotted as a single data point.

Procedures

The researcher followed a standardized script for the initial meeting with the participant, coach, and parent/guardian (Appendix A). At this meeting the study procedures were discussed, the recording and scoring method explained, and the researcher answered any questions. The participant, parent/guardian, and coach signed a consent form indicating that they understood and agreed to participate in the study. The participants and coach were asked not to discuss the study procedures with any other figure skaters and/or coaches until the study was complete.

Baseline Phase

The participants were instructed to begin each free skate session by doing a 5 to 6 minute typical practice on-ice warm-up consistently at every session. They were asked to not warm-up the target jump during the warm-up, but to perform one warm-up attempt of the target jump after the warm-up. This was an attempt to make the procedures as realistic as possible and to maintain consistency between sessions. The skater then attempted the target jump five times at her own pace. Between each attempt the skater scored the previous jump before attempting the next. Data recording sheets were collected from the participant once a week, and for each session that the coach and/or researcher were present (Appendix E).

The participants' jumping performance was scored in the absence of any treatment strategy until a stable baseline was present, or the baseline trend was in a descending direction. The stable or descending baseline was needed to determine whether there were any changes in behavior between phases and whether the treatment did in fact cause the change (Bryan, 1987).

Intervention Phase

Once the first participant reached a stable baseline the researcher introduced the concept of ST during a meeting with the participant and their coach (Appendix F). The participant filled out a pre-intervention questionnaire (Appendix G) to determine whether they were currently using ST and to what extent. The researcher then showed 15 minutes of "Sport Psyching for Figure Skaters" (Martin, 2000) to further emphasize the uses of ST specific to figure skating by showing other figure skaters using ST to prompt specific positions for jumps. The researcher facilitated the development of the abbreviated ST package by the participant and coach to ensure the procedures were followed. The involvement of coach and athlete had been recommended to enhance the effectiveness of the strategy (Orlick & Partington, 1988; Gould et al., 1992; Defrancesco & Burke, 1997).

The development of the abbreviated ST package was a modified version of Martin's (1998) sport psychology program for figure skaters. The coach and athlete listed all the specific instructional reminders that they felt were important to the successful execution of the jump (Appendix H). They then added a corresponding key word for each reminder while explaining how they felt the key word could help. The coach and athlete selected two to four key words that they felt would be the most important and would have the greatest effect on the success of the jump (Appendix I). The words were meant to

prompt specific body positions to execute the target jump. Once the key words or ST strategy had been selected and agreed on by the coach, athlete, and researcher, the athlete performed three walkouts of the jump while saying the key words out loud. The skater continued to score each jump attempt using the same scoring system and also recorded whether or not they did indeed say the key words or ST strategy, and whether they said it out loud or inside their head.

Follow-up

Three months following the study the researcher attempted to contact participant 2, the only participant still figure skating, to ask her to complete the brief follow-up questionnaire and to collect performance follow-up data. The researcher was unable to get in touch with participant 2 after numerous attempts.

Social Validity

The clinical or practical inspection of the data was done to examine the effects and importance of the treatment from the perspective of the participants and coaches. Social validity was assessed through the use of a questionnaire in which the skaters met with the researcher to complete, and the coach completed on her own time following the intervention phase (Appendices N & P).

Procedural Reliability

Procedural reliability assessments were completed to ensure that the intervention was applied as intended and that any effect of the ST on subsequent performance was due to the intervention (Hrycaiko & Martin, 1996; Ming & Martin, 1996; Martin et al., 2004). The steps to ensure procedural reliability included: (a) the researcher facilitating all meetings with the skater and coach, and supervising the introduction of the treatment; (b)

the skater indicated whether or not he/she actually used the ST strategy for each jump attempt on the recording sheet; (c) an external observer sat in on each meeting to observe that procedures were followed as per the treatment integrity checklist; and (d) the skater and coach signed off on the treatment integrity checklist to ensure that the steps taken to introduce the treatment were indeed followed by the researcher (Appendix J).

An external observer was present at each of the three meetings that occurred outside of the regular practice session. The external observer checked off the procedural components as the researcher facilitated the meetings (Appendix J). At the completion of the study the skater and coach checked off the procedural components of the treatment integrity checklist to confirm that they felt the study followed the procedures.

The skater and coach were introduced to the recording sheet and scoring system at the initial meeting with the researcher. Any questions were addressed at this time. At the initial practice session, the observer stood down at ice level by the boards to assess and score each jump attempt with the participant and to answer any questions regarding the scoring procedures. After each jump attempt the skater and researcher scored that jump attempt independently of each other. The scores were then compared and the researcher and participant gave feedback on each score (i.e., I scored this because....) to clarify any discrepancies. Using both the skater's and the researcher's average score, an IOR assessment was calculated for each of the five attempts. The IOR value was calculated by dividing the lower score by the higher score and multiplying by 100% (Martin & Pear, 1999). It is generally accepted that an IOR score greater than 80% indicates enough confidence in the reliability of the scores (Kazdin, 1977). Therefore, the goal of the initial training session was to get an IOR score above 80% as that score would reflect

confidence in the skater's and observer's ability to self-assess and score their jumping performance.

At most free skate sessions the skater self-assessed each of the five jump attempts. Periodically the researcher and coach also assessed the skater's performance of the five attempts. To control for sources of error with the subjective nature of the scoring method, a periodic IOR assessment was calculated using the average score of the skater and the researcher, and the skater and the coach. IOR checks were done for 51%, 70%, and 27% respectively for participants 1, 2, and 3.

Following the intervention phase the participants and coaches reviewed a checklist of the critical components of the treatment. They were asked to check off each treatment component that they felt was accurately delivered during the study (Appendix J).

Data Collection

Data was collected at The Dakota Community Centre where the figure skaters were registered for the 'Winnipeg Summer Skating School 2005'. Practices were at the same scheduled times Monday to Friday with approximately 10 to 20 other skaters on the ice surface at the same time as the participants. The participants, coaches, and researcher completed a standardized recording sheet (Appendix E) during baseline to record scores after all five attempts of the dependent variable (DV). During the treatment phase each observer completed a slightly modified version of the recording sheet (Appendices K, L & M) to accommodate the different focus during data collection. Recording sheets were given to the experimenter approximately once per week. Skaters were not shown the graphed results of the DV.

Not uncommon in a figure skating practice environment is the use of a video camera to record a skater performing an element and then reviewing that element at a later date. Use of a video camera has been recommended for skills such as jumping because slow motion allows for a clear look at the landing (Landin & Hebert, 1999; Johnson et al., 2004). When available, the coach and researcher videotaped the skater performing all five attempts of the dependent variable using their standard video camera at the side of the ice surface. These taped visuals of the participants were intended to be used for further assessment of the dependent variable, and to serve as another observer as assessed by the researcher.

The coach and participants independently completed a social validity questionnaire after the completion of the study to assess their satisfaction with the intervention and participation in the study (Appendices N & P).

Treatment of the data

Evaluation of the effect of the intervention was completed using both scientific and practical assessments of the data. Scientific assessment was completed to determine whether the independent variable was responsible for producing a change in the DV, skaters' jumping performance. The DV, jumping performance, as scored by the participant was averaged across the five attempts to give one data point for each session. Each data point was presented graphically for scientific visual inspection (Figure 1). Generally, the guidelines for determining whether the treatment is effective are: (a) stable or descending baseline data, (b) replication of effects across participants, (c) few overlapping data points between phases, (d) immediacy of the effect following intervention, and (e) the magnitude of the effect size (Hrycaiko & Martin, 1996; Martin

& Pear, 1999). Greater confidence are given to the results of the study if they are consistent with existing data and accepted theory (Hrycaiko & Martin, 1996). Practical assessment was completed, through social validation, to assess how significant and important the participants viewed the study and its results. Primarily, social validation addresses three questions: (1) is the dependent variable important to the participants, (2) are the study procedures acceptable to the participants, and (3) are the participants satisfied with the results (Hrycaiko & Martin, 1996). Each participant and coach completed a brief social validation questionnaire at the completion of the study.

Results

Inter-Observer Reliability

IOR scores comparing each participant's average scores with the coach and/or external observer's average scores were calculated periodically throughout the study. IOR scores were also to be calculated using a video recording when available, but due to technical difficulties there were no suitable recordings to use for further analysis. Generally, IOR scores greater than 80% are considered acceptable (Kazdin, 1977). The data demonstrated that the skaters were able to accurately assess and score their own jumping performance (DV). The average IOR scores for the dependent variables are shown in Table 1.

Table 1

Average IOR Scores

Participant	Percentage of IOR Checks	IOR Scores
P1	51% of data	93.9%
P2	70% of data	90.7%
P3	27% of data	89.9%

Procedural Reliability

The researcher facilitated all meetings with the coach and athlete using a standardized script to ensure all participants received the same information and instructions (Appendices A & F). The external observer, present at all meetings with the coach and athlete, confirmed that the researcher followed study procedures for all three participants by initialing each study component on the treatment integrity checklist as it was completed (Appendix J). At the end of the study the coach and participants also signed off on the treatment integrity checklist that each study component was indeed followed by the researcher (Appendix J). The researcher served as the external observer at practice sessions to assess and score jumping performance of each participant.

During the intervention phase each participant was asked to record whether they used the ST strategy for the previous attempt and whether it was said out loud or inside their head on the recording sheet along with the scores. All participants reported saying the ST strategy inside their head for each attempt.

Pre-Intervention Questionnaire

The participants completed a pre-intervention questionnaire prior to the treatment phase to determine their prior use of ST (Appendix G). All participants reported that they did engage in ST at different times in their practice and competition schedules and for a variety of uses (e.g., technique, stress, frustration, timing, etc.). The participants reported their use of ST as 'infrequent,' 'sometimes,' 'not too often,' and tended to be said inside their head. Participants unanimously agreed that it was very important for them to improve their performance and consistency of their target jump.

Intervention Effects

Each participant had the opportunity to provide three data points per day, provided they were in attendance at all daily free skate sessions and were able to follow the study procedures, which totals a potential of 73 data points per participant. The amount of data points collected for each participant is shown in Table 2.

Table 2

Amount of data points collected for each participant

Participant	Baseline	Intervention	Total
P1	18	21	39
P2	16	4	20
P3	22	8	30

Note. Potential for a total of 73 data points per participant

All three participants were introduced to the study and began data collection on day one of the study. Table 3 shows the means of jumping performance for all three participants in baseline and the subsequent intervention phase. Figure 1 graphically

displays each participant's average rating of jumps per session across baseline and intervention phases.

Table 3

Means for Baseline and Intervention

Participant	Baseline	Intervention
P1	1.3	1.1
P2	2.3	1.8
P3	1.6	1.1

Visual inspection of the baseline data showed all three participants with inconsistent data that lacked any clear trends. At the time of intervention participant 1 showed a very stable baseline, participant 2 was inconsistent but data was in a descending direction, and participant 3 was stable and in a descending direction (Figure 1).

Participants were introduced to the self-talk intervention in a staggered fashion as their baseline data directed. Participants 1, 2, and 3 were introduced prior to practice sessions 23, 36, and 42 respectively. All three participants showed a decrease in jumping performance means from baseline to intervention.

Participant 1 remained at stable baseline levels following the introduction of the self-talk intervention. Participant 1's jumping performance decreased from a baseline mean of 1.3 to an intervention mean of 1.1. The trend of jumping consistency improved, but at a sub-standard level that would not be attributed to any performance enhancement.

Participant 2 had only four data points during the intervention phase and showed an overall decrease from a baseline mean of 2.3 to an intervention mean of 1.8.

Participant 2 remained inconsistent without any obvious trends demonstrated in either phase.

Following intervention, participant 3's initial data point recorded a slight increase in performance, but subsequent data points demonstrated performance decrements. Remaining inconsistent into intervention participant 3 showed a performance mean decrease of 1.6 in baseline to 1.1 during intervention.

The three participants did not show any performance increase after the self-talk intervention was introduced. All three participants displayed numerous overlapping data points between baseline and intervention phases and overall there was no immediate effect at the point of intervention. During intervention participants 2 and 3 did not score above their baseline means. Participant 1 scored three data points, independent of one another, above baseline mean during the intervention phase.

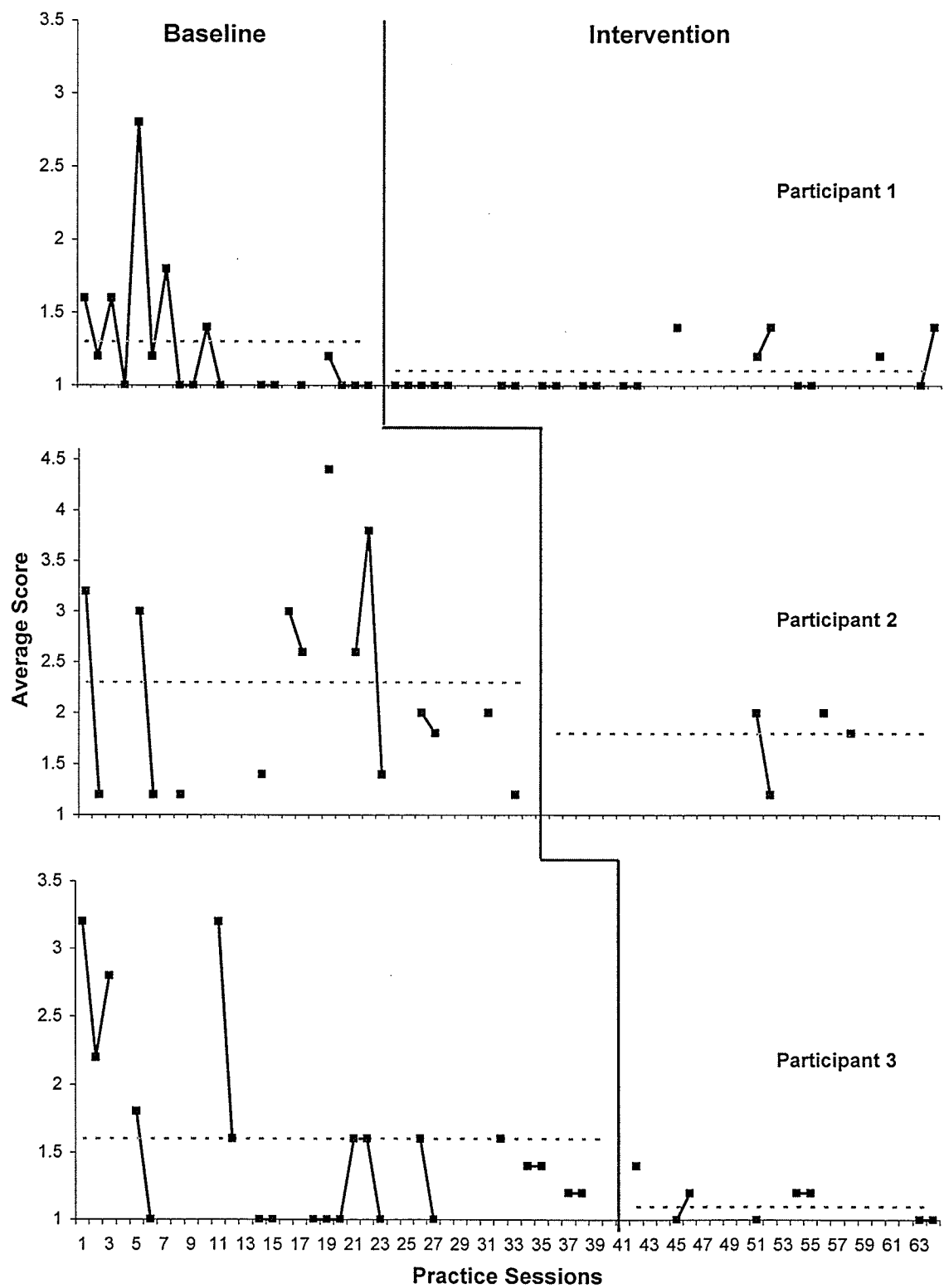


Figure 1. Average rating of jumps per session

Social Validation by Participants

Practical importance to the participants was assessed through a social validation questionnaire (Appendix N). Participants were asked to rate how they felt about the components of the ST strategy on a scale of one to five, answer open-ended, or Yes/No answers. Participants were not shown the graphed data prior to completion of the social validity questionnaire. The results of the questionnaire are shown in Appendix O. Overall all three participants rated their experience in the study as positive. The participants suggested that five attempts per session sometimes interfered with their practice schedule/routine and that sometimes it was too much to think about.

Participant 1 felt that the ST strategy was somewhat helpful in improving her jumping performance and consistency and that she would continue to use it. She felt that the ST helped with her jumping performance and consistency because, "It helped me keep track of my attempts and focus on key terms which increased my consistency." She liked that the ST strategy "kept me focused and the terms were simple to remember and apply." She found that being involved in the process of developing the ST strategy was helpful. Participant 1 found that assessing and recording her own performance was helpful and that having the coach and researcher assessing performance was only somewhat helpful.

Participant 2 felt that being involved in the development of the ST strategy, and the ST strategy itself, was very helpful in improving her jumping performance and helpful in improving her jumping consistency. She felt that the ST strategy helped with her jumping performance and consistency because, "It helped to keep my focus on the

jump.” Participant 2 felt that she was going to continue to use the ST strategy and that she “had to get used to someone observing me, but it was worth it.”

Participant 3 felt that the ST strategy was only somewhat helpful in improving her jumping performance and consistency and felt that having the researcher observe, assess, and score her performance was not helpful. She felt that being involved in the ST strategy development, assessing and recording her own performance, and having her coach do the same was helpful. Participant 3 felt that the ST strategy helped with her jump performance and consistency “because when my thought process became consistent so did my technique; errors were then easier to fix, and improvement was steady.” She was planning to continue using the ST strategy, and liked that “it organized my thoughts before and during the element.”

Social Validation by Coach

The coach for all three participants completed a social validity questionnaire to provide her perceptions on the study procedures and ST strategy. All three participants had the same coach, but the coach completed a separate questionnaire specific to each participant. She was asked to rate components of the ST strategy and study procedures using a 1 to 5 scale and open-ended responses. The results of the questionnaires are shown in Appendix Q.

The coach did not feel that the ST strategy helped to improve P1’s jumping performance and consistency and therefore was not satisfied with the amount of improvement. She felt the ST strategy helped P1 get into strong positions in the air, which she has trouble doing.

The coach was not satisfied with the amount of improvement shown by P2, but did feel that the ST strategy was helpful in improving her jumping performance and consistency. She liked that the ST strategy “creates more consistency and ability to cue into the proper time to focus on helpful strategies.”

The coach was satisfied with the amount of improvement shown by P3 and felt that the ST strategy was helpful. She felt P3 would have benefited more had she said the words out loud, but the skater was too self-conscious to do so.

The coach felt that other skaters would benefit from this type of ST strategy and that she would develop ST strategies for skaters in the future. She indicated that more time would have been great to implement the program and see changes, and wished we had gotten into the ST strategy earlier into the program. She felt that the procedures could be more effective if done earlier in the skaters' training.

Discussion

Many studies have shown ST to be effective in improving performance in a variety of sports, such as: tennis, soccer, track and field, sprinting, cross-county skiing, and figure skating (Landin & Hebert, 1999; Ziegler, 1987; Johnson et al., 2004; Gregg, Hrycaiko, Mactavish, & Martin, 2004; Mallett and Hanrahan, 1997; Rushall et al., 1988; Ming & Martin, 1996). It has been demonstrated that instructional ST is more effective in enhancing performance than mood or motivational ST (Landin & Hebert, 1999; Rushall et al., 1988).

The present study was designed to examine whether an individualized instructional ST package was an effective performance enhancement strategy for improving figure skaters' jumping performance and consistency. The coach, skater, and

researcher developed the individualized ST strategy, as is suggested in the applied sport psychology literature (Orlick & Partington, 1988; Gould et al., 1992; Defrancesco & Burke, 1997). The ST strategy was developed using the guidelines outlined by Moran (2004), Martin (1997), and Landin (1994): positively phrased, brief, explicit, and logically associated with the task. Specifically, the ST development procedures were similar to Ming and Martin (1996) and Garza and Feltz's (1998) studies with figure skaters' compulsory figures and free skate routines respectively. The ST delivery procedures were similar to the ones used by Johnson et al. (2004) and Landin and Hebert (1999) with soccer and tennis players respectively. Procedures used to guide the present research were chosen on the basis that they were effective in their respective studies and demonstrated a good fit with the intended objectives.

The present study was unique as it looked at the effects of ST on jumping performance and consistency of elite figure skaters. Research in the past has been conducted looking at the effect of ST on compulsory figures performance, but because figures are no longer part of competitive figure skating these previous results are no longer as significant or relevant.

The participants in the present study, elite figure skaters executing a complex skill in an applied setting, did not show performance improvements as was demonstrated in previously reported studies examining the use of instructional ST (Ziegler, 1987; Landin & Hebert, 1999; Theodorakis et al., 2001; Johnson et al., 2004; Papaioannou et al., 2004; Palmer, 1992; Ming & Martin, 1996; Patrick & Hrycaiko, 1998; Garza & Feltz, 1998; Rogerson & Hrycaiko, 2002). It was hypothesized that the skaters would improve their jumping performance and consistency following the introduction of the ST strategy.

Surprisingly, the ST strategy developed by the skaters and coaches was not effective, resulting in a decrease in performance for all three participants.

The selection criteria, complexity, and continuous nature of the DV lead to a few possible explanations for these surprising results. The selection criteria for participation in the study was that the skater “Be working on a double or triple jump – landing it inconsistently (i.e., approximately one out of every five attempts).” This selection criteria was publicized and discussed with the coach, but was not formally observed or evaluated by the researcher. The lack of formal observation, screening and evaluation by the researcher raises some questions when looking at the baseline data whether the skaters were actually able to land the jump at all prior to the study. If the skaters were not able to land the jump prior to the study then it may explain the lack of jump performance improvements because more time may have been required. Prior screening and evaluation of the participants prior to their participation in the study would result in more confidence in the results.

The DV was a highly complex skill that the athletes could not complete consistently prior to the intervention. Most of the previous research studies that have shown instructional ST to be effective were attempting to make minor improvements or modifications to a behavior that could already successfully be completed or was easily mastered. For example, Gregg et al. (2004) demonstrated the use of a mental skills package including ST to be effective in decreasing the frequency and duration of off-task behaviors, and increasing work output (percentage of laps) completed by Special Olympics track and field athletes. The dependent variables were skills that the athletes could already accomplish but weren't doing enough, or to decrease an inappropriate

behavior that was occurring too often. Ming and Martin (1996) reported that their ST package led to an improvement of compulsory figures for four pre-novice and novice level figure skaters. Although the actual compulsory figure was novel to the skaters, the foundational skills involved in compulsory figures remains similar across the levels and the skaters were at a relatively high level. Masser (1993) demonstrated that instructional cues were effective in teaching first graders to effectively perform handstands and forward rolls, basic skills. Finally, Landin and Hebert (1999) found a two-word ST strategy (split-turn) introduced to elite tennis players focusing on the tennis volley to be effective in remediation of movement pattern problems. The DV targeted in this study was more complex than the tennis volley, handstands and forward rolls, compulsory figures, off-task behaviors and work output cited above that were shown to be successfully enhanced by the use of ST. The complexity of the figure skating jump incorporates many variables to occur at the exact time in order to be successful (speed, strength, flexibility, timing, etc.).

In the present study the DV was also assessed as a continuous skill based on an approximation of the outcome measure – successfully landing a jump. The assessment and scoring of the jump as an outcome measure may have overlooked the critical area of performance error and subsequent improvements that may have resulted from the intervention. The skater and coach chose a target jump to use in the study but were not required to specify which area or phase of the jump that they felt was the target for the ST strategy that they developed. When looking at an entire figure skating jump it can be broken down into the four phases: set-up, take-off, airborne position, and landing. I would speculate that the ST strategy was focused on improving a performance deficit in

one phase of the jump, such as the airborne position. The ST strategy may not have been effective in improving overall jumping performance, but at this point we are unable to conclude whether it was effective in correcting or improving the specific performance deficit that it was initially intended for. If the performance deficit was improved by using the ST strategy then maybe another aspect or phase of the jump was keeping the skater from landing the jump successfully. This possible explanation underscores the importance of obtaining a video recording of the jump performance.

Another possible explanation for the results may have been that the introduction of the study procedures and ST strategy served as a distraction to the young elite figure skaters' attempting the highly complex and demanding skill, rather than facilitating performance improvement. Although we did attempt to design the study and the ST strategy to be as minimally intrusive as possible, there was no real way of knowing exactly how the participants in this study would respond. Prior to the beginning of the study the participants most likely had some corrections or specifics that they were focusing on while practicing the target jump. In the baseline phase the participants were required to assess and score each of their five jump attempts at the beginning of each free skate session. Periodically the external observer and coach would also assess and score the participants five jump attempts independently. Being judged by themselves, their coach, and a stranger may have been distracting the participants from thinking about the techniques or instructional prompts that they typically would have focused on, instead the skaters may have been thinking about the scoring procedures.

Although the skaters may have been distracted during the baseline phase from the judging and scoring procedures, the intervention phase began with the introduction of the

ST strategy – potentially another distracter and more things to think about. At the time in the study where the objective was to see performance improvements, decreased performance resulted, which may have been due to the cognitive overload of things that the participants were thinking about.

It may also be suggested that it was not only technique, which was addressed by the ST strategy, which may have been limiting these participants from mastering their target jumps. Potentially other mediating factors such as strength, speed and conditioning could also have played a factor in their inability to successfully land their target jumps. When asked in the social validity questionnaire, all three participants felt they were physically capable of performing their target jump.

A final explanation for the lack of performance improvements that were shown in this study may have been the idea and power of 'belief.' Along with commitment to the study would be the power of belief by the participants and correspondingly how much effort was put into learning and using the ST strategy consistently. Prior to the study the participants were asked if they felt it was important to improve performance and consistency of their target jump, in which they all answered as 'very' important to them. Besides being important to the participants, they were not asked why they volunteered for the study or if it was recommended to them by their coach. It would have been beneficial to ask the participants how committed they were to doing the work required for performance enhancement and if they believed that mental skills such as ST could benefit them. The level of commitment by the participants should be questioned because two participants quit figure skating all together prior to the end of summer school, and therefore may have effected how much work and belief they had in their ability to

perform their target jumps. The area of belief might further explain the lack of performance improvement and the abundance of missing data points from the participants.

Interestingly, all three participants' performance, although decreased, did show a general trend of improvement in consistency after the intervention was introduced. It should be noted that P2 had only four intervention data points, therefore making it difficult to conclude this with as much certainty as P1 and P3. It is generally accepted that coaches value consistency of athletic performance (Gregg et al., 2004), but the results from this study would not be considered valuable consistency by coaches and/or athletes. One explanation for this decrease in variability in the skaters jumping performance may be that the skaters were performing at such a low level that there was less room for variability.

A positive outcome of the study was that IOR scores ranging from 89.9 – 93.9% were calculated for each participant. These results demonstrated that the skaters were able to accurately assess and score their own jumping performance. The use of participants to collect their own data, assess and score, should increase the opportunity for further research without depending on external observers to be present at all practice sessions. This will save time and money for future researchers examining what effects the performance of figure skaters.

In addition, the social validity assessment completed by the participants and coach at the end of the study indicated that they felt that the ST strategy was at least somewhat helpful at improving jumping performance and consistency and supported the use of the ST strategy. When interpreting the social validity results it is important to keep in mind

that the participants and coach completed it prior to seeing any graphed performance results, which may have influenced their answers. The participants felt that the ST strategy helped them to stay focused on the target jump and felt it was beneficial to be involved in the development of the ST strategy. One skater commented that it took a while for her to get used to the study procedures, indicating that maybe a longer study period and more data points may have potentially allowed for more time to enhance performance. The participants' one concern with the study procedures were that five attempts per session sometimes interfered with their practice schedule and routine. They also felt that the ST strategy, at times, was just too much to think about, reaffirming the ST guidelines used to develop the strategy (Moran, 2004; Martin, 1997; Landin, 1994). The results indicated that all three participants felt their experience in the study was positive and that with more time the ST strategies could be beneficial for jumping performance and other elements in figure skating.

The coach felt that the ST strategy helped the skaters focus in on the correct cues at the correct time while organizing their thoughts. Interestingly enough, the coach was satisfied with the level of improvement shown by P3, which is contradictory to the graphed results as there were no performance improvements shown. The coach was not satisfied with the amount of improvement, or lack there of, shown by P1 and P2. Although the results of this study did not show that the ST strategy was effective in enhancing jumping performance, the coach indicated that she felt that other skaters would benefit from using such a ST strategy and that she would help other skaters develop similar ST strategies in the future. The coach felt confident in her ability to develop ST strategies on her own indicating that with enough information and guidance coaches are

capable of developing ST strategies with the figure skaters. From an applied consulting perspective this is important because it shows that athletes and coaches are able to continually reassess and refine their ST strategies as their progress and growth develops, which can enhance the long term effectiveness of the ST strategy (Johnson et al., 2004; Landin & Hebert, 1999; Defrancesco & Burke, 1997; Gould et al., 1992; Palmer, 1992; Orlick & Partington, 1998). The coach's support for the ST strategy corresponds to the findings of other studies using ST to enhance performance in a variety of sports (Johnson et al., 2004, Patrick & Hrycaiko, 1998; Wanlin et al., 1997).

Applied research settings have the potential of offering a whole host of difficulties that may not be controlled or anticipated. Some of the difficulties experienced in the present study were participant retention and commitment. The study began with five participants and within the first two weeks of the study two dropped out due to circumstances that were keeping them from committing fully to the study. The three participants that completed the duration of the study had the potential of submitting one data point for 73 different free skate sessions, but at the end of the study the mean amount of data points completed were only 30. The many missed sessions or data points can be attributed to absence from practice (health, holiday); participants having a 'bad' practice and therefore did not always get to their target jump, and two participants quitting skating prior to the end of summer school. Scheduling of lessons from coaches and program run-throughs scheduled by the music man were also reasons for missed sessions or data points. Being able to control some of these interruptions in the data collection process would have increased the opportunity and likelihood that the intervention may have been effective with these participants.

However, a limitation of the study that should be addressed in future research is the duration of time that the study procedures were delivered in. The present ST strategy may have served as a distraction to the skaters and had the study duration been longer the participants would have had more time in baseline to get accustomed to the judging and scoring procedures prior to the introduction of the ST strategy. This may have lessened the potential that the ST strategy was a potential distraction instead of facilitating performance improvements as intended. Increased length of the study would also allow for greater exploration into the reasoning that it was not only technique that was stopping the skaters from landing their target jump successfully. This increase in time would let the skaters learn and adapt the ST strategy while also developing the other areas that impact jumping performance, such as strength, speed and conditioning. With the decrease in jumping performance variability that the skaters showed, increasing the amount of time that the skaters had to learn and become comfortable using the ST strategy may have resulted in the skaters ability to refine their technique and subsequently improving their jumping ability.

The coach also commented in a personal discussion with the researcher that she felt that summer school may not have been the most ideal opportunity to introduce the intervention because she and the participants were not able to give the study the attention it needed to be effective. Summer school is an intense two months of on- and off-ice training, test days, and competitions that keep the skaters and coaches very busy. This may have been a contributing factor for some of the missed data points and lack of performance improvements, as the skaters may have had so many other things to work on in a short period of time that they would have had to skip the study procedures

occasionally. The decision to collect data during summer school also resulted in a lack of competitive opportunities to assess and score the DV, which has been recommended in the literature (Johnson et al., 2004; Kendall et al, 1990).

In addition to the lack of competitive opportunities there were several other limitations to the present study which should be considered in future figure skating research. First, the scoring system used in the study did not capitalize on the new scoring system being used in competitive figure skating which has a detailed point breakdown for attempting to land a jump. Use of the new scoring system would be more relevant to the coaches and figure skaters. Similarly, figure skating research could also include the number of 'balked' jump attempts as a dependent variable as this was expressed to be an issue for a number of skaters. A 'balked' jump attempt is when the skater is setting up the jump but instead of taking off he/she skates through the attempt or 'pops' the jump, which can be a source of frustration and inconsistency for the skater. Finally, the study did not specifically control the time and quality of how the participants were warming up prior to the five jump attempts. The participants were instructed to warm-up each free skate session using the same 5 to 6 minute warm-up and refraining from warming up the target jump. When watching the participants it was noted that they did not warm-up the same way for each of the three daily free skate sessions and that the warm-ups were very different in quality and length across skaters. Sometimes the participants would have a lesson at the beginning of the session and therefore used an abbreviated warm-up or would get caught up on an 'easier' jump that they were having difficulty landing successfully before moving on. In the present study the intention was to obtain performance follow-up data to determine whether the participants were continuing to use

the ST strategy and whether it was effective in enhancing performance. Similarly, an effort was made to obtain video tape of the jumps to assist in observer reliability and skill analysis. Neither of these efforts was successful, but both initiatives should be an integral part of future research.

Future research could also examine the use of instructional ST on figure skating jumps by using a combination of forward chaining and biomechanical analysis, and by assessing the DV as a social validity measure. Forward chaining is a technique that can be used to focus on each individual phase of the figure skating jump and not simply as an outcome measure. In forward chaining a ST strategy would be developed, used, assessed and scored for the initial phase of the jump until mastery before focusing on the next phase. Once that aspect or phase of the jump has been mastered, the skater would be introduced to the ST strategy for the next phase, and so on until the ST strategy or key words had been learned for the entire jump and it had been successfully landed (Martin & Pear, 1999). An interdisciplinary approach including biomechanical analysis to analyze the jumping technique would strengthen the depth of the forward chaining approach. A biomechanical analysis would inform the participant and researcher exactly where and what the performance deficits are and if they have been improved prior to focusing on the next phase of the jump. Another alternative would be to assess the DV as a social validity measure with the participants determining whether aspects of the jump technique were improved and therefore eliminating the outcome measure used in this study.

Future research is needed to examine the use of instructional ST with elite figure skaters and its effect on performance of jumps that the skaters are able to land successfully more often than not. It would also be worthwhile extending the research in

figure skating to younger athletes that are just beginning to learn the more complex figure skating jumps. It may be more beneficial and less distracting if skaters were taught at an earlier age and lower level to use ST or key words to help prompt the correct body positions when jumping.

A recommendation for further study is to continue to explore the use of coaches and athletes in the development of ST strategies. This requires evaluating how sport psychology is typically practiced and really challenging our thoughts and beliefs on the best way to inform, educate and help elite athletes reach their potential. More research should be undertaken to examine the accurateness and effectiveness of having athletes involved in assessing and scoring their own athletic performance as it could be very effective in the development of an athlete. The opportunity to include athletes in the development and assessment of mental skills may lead to more responsibility and accountability on behalf of the athlete's performance. It is also recommended that more time be spent training the participants on the ST strategy and key words to ensure that they are well learned and understood prior to introducing them to the DV. It would be beneficial for future research to address the timing of when ST or key words are said and when it is the most ideal for performance enhancement. The use of a microphone worn by the participants would increase the confidence that they did use the ST or key words and it would be easier to clarify when exactly they are being said.

In conclusion, the present study adds to the current literature by extending the research on the effectiveness of teaching skilled athletes to use ST, and by challenging how it is typically practiced. The study informs coaches and sport psychology professionals to critically assess how and when they are formally introducing mental

skills to their athletes. The present study showed that the individualized instructional ST strategy developed by the skater and coach was not effective. However, this study demonstrated that elite figure skaters were able to accurately assess and score their own jumping performance and that the subjective reaction of the skaters and coach was that the ST strategy was at least somewhat helpful.

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Appendix A

Introductory Meeting (Skater, Parent, and Coach)

Hi, my name is Deanna Betteridge, and I want to start off by thanking you for agreeing to be a part of this study. I am currently a student at the University of Manitoba, and am a practicing performance enhancement consultant. I have a background in figure skating – which is where my interest in the area of sport psychology started. I feel that the importance of our ‘mental’ game is very applicable to the sport of figure skating and that is why I want to do this study.

The study will go for the entire summer skating session and will include the first 10 to 15 minutes of each free skate session that you attend. The first phase of the study consists of observing and recording your jumping performance. This will give us a baseline score of your performance on that jump. After a week or two, we will meet again, you (the skater) will fill out a brief questionnaire, and then I will teach you how to use the psychological strategy for improving your jump. We will continue to monitor your jumping performance during the entire study. At the end of the study we will meet once more where I will get you to fill out another questionnaire, and we will discuss the results of the study.

For each free skate session during the entire study, I want you to do a typical practice on-ice warm-up consistently at every session. But, please do not warm-up the target jump during this 5-6 minute warm-up. After your 5-6 minute warm-up, then perform one warm-up attempt of the target jump. Then, I want you to set up your _____ (jump) as it would be in your program, and do five attempts. In between each attempt I would like you to record whether the jump was successful or not on a scale

from one to six, which we will go over in just a minute. Take your time between each attempt, but don't do any other elements – we would like all five attempts to be in a row. After you complete your five jump attempts, go about your practice as you normally would.

When your coach is available I would like him/her to also observe your five attempts and score them on the same scale. Periodically I will also be attending free skate sessions to observe and score your five attempts as well. You will also be videotaped periodically throughout the study – just to use as another scoring method. I will view the videotapes in slow motion and score them the same way.

The recording sheet and scoring method will be the same for you (the skater), your coach, and myself. The top portion of the recording sheet is for me to keep things organized – so please fill it out for each session. After each jump attempt I would like you to go back to the boards and score it and add any additional comments that you feel would further explain the score. The scoring system is from one to six and is explained on the form – do you have any questions regarding how each jump will be scored and/or the procedures so far? Please keep all your recording sheets with you, so I can collect them every day.

All forms that you fill out with any personal information on them will be stored in a filing cabinet for the duration of the study – your consent forms, recording sheets, questionnaires, etc. In my report of the study, all data and results will be described in a way where you will not be identified personally. All your data will be coded to the specific participant number that I assign you. Three months after the completion of the study I will shred all written and visual documents that have personal identification, and

will only keep the participant number coded data for future reference and publication opportunities. Do you have any questions regarding confidentiality and the use of your personal information?

At the end of the study we will meet once again to discuss your experience in the study and get you (the skater and coach) to fill out another brief questionnaire. Results of this study will be available to you by contacting Dr. Dennis Hrycaiko or myself after November 1, 2005.

At any time during the study you are able to withdraw completely from the study – without any questions asked, and to no penalty for yourself. Is that clear?

During the study I would like you not to discuss any part of the study with the other skaters and coaches until it is over. And, I would like you to keep your scheduled private lessons the same as you had intended. Do you have any questions regarding the procedures of the study and/or your role in the study?

If there aren't any questions, then I will give you each (skater, parent, coach) a copy of the information for consent form to read (Appendices C, D, E). If you all agree to participate in the study after meeting with me today and reading the information form then I would like you each to sign two copies of the informed consent form. You will keep one copy and I will keep one copy in your file for my records.

Okay, so here are some recording sheets to get you started. Thanks again for participating in our study.

Good luck and have fun!

Appendix B

Information for Consent – Participant

Dear Participant:

Thank you for your interest in our study. The purpose of this study is to examine the effects of using a psychological skill for improving figure skaters' jumping performance and consistency. I am writing to request your permission to participate in our study.

The study will run over the summer skating session of July and August 2005. Your participation in the study will involve 3 scheduled meetings outside regular practice time that will take approximately 20 – 45 minutes each, and approximately ten to fifteen minutes at the beginning of each free skate session that you attend.

Throughout the study you will be filmed with a video camera, by the researcher or your coach, to use as supplemental data. The researcher will shred these tapes at the completion of the study, and no copies will be made.

Your participation in the study is completely voluntary. You have the right to withdraw from the study at any time and/or refrain from answering whatever questions you would prefer to omit. All the information you provide will be number coded to your participant number and will remain strictly confidential. Three months after the completion of the study all documents with your name and personal information will be shredded and discarded. Findings from the study will be reported so that you cannot be identified, and will be available to all participants. There will be no additional risks associated with your participation, as the skill you are required to perform is already being practiced.

This study is a master's thesis project through the University of Manitoba. Dr. Dennis Hrycaiko is the faculty advisor, and supervisor of all research. Results of this study will be available to you after November 1, 2005. If you would like to receive a copy of the results please check off the appropriate box on the attached consent form.

The Education/Nurses Research Ethics Board (ENREB) has approved the study. If you have any concerns regarding the study you may contact the Human Ethics Secretariat at 474-7122, the primary researcher, Deanna Betteridge at 474-8412 or 275-8261, or the thesis advisor, Dr. Dennis Hrycaiko at 474-8764.

We are looking forward to your participation in the study. Please feel free to contact us if you have any questions or concerns prior to, during, or after the study.

Deanna Betteridge, B.E.S.S. (Researcher)

Faculty of Phys. Ed. and Rec. Studies
Studies

University of Manitoba

Phone: 474-8412 or 275-8261

Dennis Hrycaiko, Ph.D. (Advisor)

Faculty of Phys. Ed. and Rec.

University of Manitoba

Phone: 474-8764

Thank you for your interest,

Deanna Betteridge, B.E.S.S.

Consent to Participate

I understand that a study is being conducted at the University of Manitoba as part of the requirements to complete a Master's degree, to assess the use of a psychological skill and its effect on jumping performance and consistency of the participants.

I have been asked to participate in this study, which will be conducted in July and August 2005. All sessions in addition to regular practice will last approximately 20 – 45 minutes and will be scheduled at a time that works for the researcher and myself.

I agree to participate in this study and understand that:

- All information I give will be treated confidentially;
- I will not be identified personally when the results of the study are presented;
- And, I can stop participating at any time that I choose without any penalty or questions asked.

Participant Name (please print): _____

Participant Signature: _____ Date: _____

I would like a copy of the results when they are available Yes ____ No ____

Researcher Signature: _____ Date: _____

Appendix C

Information for Consent – Parent/Guardian

Dear Parents/Guardians:

Thank you for your interest in our study. We have selected your son/daughter to participate because we are interested in examining whether the use of psychological skills is an effective performance enhancement strategy for improving figure skaters' jumping performance and consistency. I am writing to request your permission for your son/daughter to participate in our study.

The study will run over the summer skating session of July and August 2005. Your son/daughter's participation in the study will involve 3 scheduled meetings outside regular practice time that will take approximately 20 – 45 minutes each, and approximately ten to fifteen minutes at the beginning of each free skate session that he/she attends.

Your son/daughter's participation in the study is completely voluntary, and he/she has the right to withdraw from the study at any time and/or refrain from answering whatever questions he/she would prefer to omit. All the information you and your son/daughter provides will be number coded to a participant number and will remain strictly confidential. At the completion of the study all documents with any personal information will be shredded and discarded. Findings from the study will be reported so that your son/daughter cannot be identified, and will be available to all participants. There will be no additional risks associated with your son/daughter's participation, as the skill they are required to perform is already being practiced.

Your personal participation in the study will involve being in attendance at the initial information meeting with your son/daughter and their figure skating coach, which will take approximately 20 minutes.

This study is a master's thesis project through the University of Manitoba. Dr. Dennis Hrycaiko is the faculty advisor, and supervisor of all research. Results of this study will be available to you after November 1, 2005. If you would like to receive a copy of the results please check off the appropriate box on the attached consent form.

The Education/Nurses Research Ethics Board (ENREB) has approved the study. If you have any concerns regarding the study you may contact the Human Ethics Secretariat at 474-7122, the primary researcher, Deanna Betteridge at 474-8412 or 275-8261, or the thesis advisor, Dr. Dennis Hrycaiko at 474-8764.

We are looking forward to your son/daughter's participation in the study. Please feel free to contact us if you have any questions or concerns prior to, during, or after the study.

Deanna Betteridge, B.E.S.S. (Researcher)

Faculty of Phys. Ed. and Rec. Studies
Studies

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Phone: 474-8412 or 275-8261

Dennis Hrycaiko, Ph.D. (Advisor)

Faculty of Phys. Ed. and Rec.

University of Manitoba

Phone: 474-8764

Thank you for your interest,

Deanna Betteridge, B.E.S.S

Consent to Participate

I understand that a study is being conducted at the University of Manitoba as part of the requirements to complete a Master's degree, to assess the use of a psychological skill and its effect on jumping performance and consistency of the participants.

My son/daughter has been asked to participate in this study, which will be conducted in July and August 2005. All sessions in addition to regular practice will last approximately 20 – 45 minutes and will be scheduled at a time that works for the researcher and my child. I will participate in the initial information meeting with my son/daughter, their skating coach, and the researcher, which will last approximately 20 minutes.

I give my child permission to participate in this study and understand that:

- All information we give will be treated confidentially;
- My son/daughter will not be identified personally when the results of the study are presented;
- And, my son/daughter can stop participating at any time that he/she chooses without any penalty or questions asked.

Parent/Guardian Name (please print): _____

Parent/Guardian Signature: _____ Date: _____

Please specify your relationship to the participant: _____

I would like a copy of the results when they are available Yes ____ No ____

Researcher Signature: _____ Date: _____

Appendix D

Coach Agreement

Dear Coach:

Thank you for your interest to work in conjunction with your skater as a part of this study. Your involvement includes attending three meetings with the skater to discuss the study and then to develop the psychological strategy with the skater. Each meeting will last approximately 20-45 minutes. When you are available, you will be asked to videotape the skater's performance executing his/her five trials at the beginning of each free skate session. This should take approximately 5-10 minutes.

Please keep feedback and scheduled private lessons with the skater as you normally would. You are also asked not to discuss the study with any other figure skating coaches and/or skaters until the completion of the study.

I agree to participate in this study and understand my role:

- As an observer / data collector when I am able to;
- To facilitate the development of the psychological skill at the time of the intervention phase of treatment;
- And, that I am not to discuss the project with other coaches and athletes until the study is completed.

Coach Name (please print): _____

Coach Signature: _____

Date: _____

Researcher Signature: _____

Date: _____

Appendix E

Baseline Recording Sheet

Recorder's Name: _____

Skater's Name: _____ Coach: _____

Date: _____ Time: _____ Rink: _____

Was the skater in a lesson during the five attempts? Y / N

Was the skater being video taped during the attempts? Y / N

If yes, by whom: _____

Specific Jump: _____

Attempt Number	Score (Min of 1 point; Max of 6 points each)	Additional Comments
1		
2		
3		
4		
5		

Scoring System**1 Point** – Poor Attempt**2 Points** – Incomplete rotation; but on one foot**3 Points** – Landed backwards, but lost the edge and fell**4 Points** – Landed backwards, and flipped out of it, but stayed up; or, a good 2-foot attempt (2-footing it was hardly noticeable)**5 Points** – Landed but with a hand down or a control problem (but stayed on one foot)**6 Points** – Landed clean

Appendix F

Introduction to Self-talk - Procedures (Skater and Coach)

First I am going to introduce self-talk, and then I would like the skater to complete a brief questionnaire. The questionnaire should take approximately 10 minutes to complete. We will watch a brief video on self-talk and then we will work through the development of our self-talk strategy.

Self-talk is the words that we say or think to ourselves. Self-talk or key words can be thought inside our head or can be said out loud to ourselves. We use self-talk in many areas of our life, reminding ourselves of what we need to get at the grocery store, trying to remember a phone number, or when we study for an exam at school. Typically, self-talk can be instructional (i.e., pull your arms in tight), or can be motivational (i.e., you can do it; you've practiced hard for this – good job!), or it can affect your mood (i.e., smooth, smile, energy!). We are going to focus on the instructional self-talk that reminds you of what to focus on to be successful. For example, if a skater consistently drops their right shoulder going into their triple-toe than saying to him or herself “square” might be a key word to remind them that if I keep my shoulders square I will have a more solid takeoff. Self-talk is any sort of conversation that goes on in our head that we say either out loud or inside our head. Now I would like you to answer this questionnaire regarding your prior knowledge and use of self-talk. (Give skater Pre-Intervention Questionnaire)

Before we begin with your specific self-talk strategy, we are going to watch 15 minutes of “Sport Psyching for Figure Skaters” with Dr. Garry Martin (Martin, 2000). This video will further explain the use of self-talk and show some national level figure skaters actually using self-talk in their practice sessions.

We are going to develop your self-talk strategy together, all three of us. We are using a modified version of a sport psychology program that Dr. Martin developed for the provincial level figure skaters that he was working with at the time. If you have any questions at any time, please ask.

I have given both of you (coach and skater) the same form. I want you to write the specific jump that we are focusing on at the top of the page. Now, individually I want you to list specific instructional reminders that you have been given, or have given for setting up this jump – anything you feel that is important to the successful execution of this jump. Keep in mind that we are focusing on what we want to do, and not what we don't want to do. What are some key words that you could use to help remember these things? Some examples might be “shoulders square”, “step close”, “check”, “tight”, “reach”, etc. Whatever it is that you should focus on when setting up for this jump and the specific reminder that goes with it.

Now that you both have a list of reminders and key words, I want us to review each of your lists to discuss the importance of each point and how you feel the key word could help. We don't want you to be overloaded when preparing for this jump so I want you to pick out two or three points/key words that you feel are the most important and would have the greatest effect on the success of this jump.

Let's write the key words and reminders that we have decided to use on another piece of paper in bright colored marker. Do you both agree that these are the best key words for you to use when setting up this jump? I will give you (the skater) a copy of each sheet we used today as a reminder of how we developed our self-talk strategy, but I want you to focus only on the two or three key words before each attempt.

Now that we have decided on the key words, I would like you to practice them for me here today. Being as realistic as possible I want you to do three walkouts of your jump, either standing up and/or imagining them in your mind. Include in these walkouts the use of your key words, saying them out loud for practice – just to make sure that you have them memorized and that you understand when to say them. As we saw in the video there are three options as to when we use our self-talk: (1) while skating around before the attempt, (2) in your set-up immediately before the jump, (3) or actually during the execution of the jump. You can decide when you would prefer to say your self-talk and then write it down on your form to keep it consistent. Now, please do your three walkouts saying your self-talk out loud. Do you have any questions about your self-talk strategy and when to use it?

I want you to warm-up for each free skate session the same as you have been. Then do a walkout on the ice of the jump that you are working on, saying your key words, like you saw on the videotape. Then do the five attempts of the jump. The recording and scoring procedures will remain the same. Please say your key words before each of the five attempts of your _____ (jump). You can say these words inside your head or out loud – whatever feels more comfortable for you. Please remember not to discuss the study or your self-talk strategy with any other skater or coach until the end of the study.

Do you have any questions? Thanks again for participating and feel free to get in touch with me at any time throughout the study.

Appendix G

Pre-Intervention Questionnaire

Name: _____ Date: _____

1. How important is it for you to improve the performance and consistency of the
_____ jump? (please circle)

Not Very -----Somewhat -----Very

2. Do you think you have ever used self-talk of key words for jumps? Yes No

3. If yes, were you aware that you were using self-talk or key words

for your jumps? Yes No

4. In what types of situations would you use the self-talk or key words for your
jumps?

_____	_____
_____	_____
_____	_____

5. How often would you say you use self-talk or key words for your jumps?

6. Do you say the self-talk or key words out loud or inside your head?

Appendix H

Self-Talk / Key Words for my _____

What should I focus on when setting up this jump?

Some Prompts:

What are some reminders that the coach has given me when setting up the jump?

When I perform a successful attempt what helped?

When I perform a successful attempt what am I thinking about?

When I perform a successful attempt what am I focused on?

What should I be focused on when setting up this jump?

Appendix I

Selected Self-Talk / Key Words

Name: _____

When are you going to say the key words: _____

Remember to say these key words before each of your five attempts!

Have Fun!

Appendix J

Treatment Integrity Checklist

	Researcher	Coach	Participant
1. Participant and coach agreed with the recording procedure			
2. Participant and coach agreed with the scoring method			
3. Participant and coach met with the researcher to discuss using self-talk			
4. Researcher showed the self-talk video, 'Sport Psyching for Figure Skaters II' by Dr. Martin			
5. Participant, coach, and researcher came up with valuable key words / self-talk for the participant to use prior to each attempt of the jump			
6. Participant agreed to the choice and value of the key words for his/her jump			
7. Coach agreed to the choice and value of the key words for the skater			
8. Researcher asked the skater to say their ST out loud for three walkouts			
9. Skater did the walkout three times while saying their self-talk			
10. Skater rated their five jump attempts at every free skate session			
11. Following the intervention, the skaters recorded whether they used their self-talk after each attempt			
12. Coach answered whether they encouraged the skater to use their self-talk before each attempt			
13. Skater recorded whether they said their self-talk inside their head or out loud after every attempt			

Appendix K

Intervention Recording Sheet - Participant

Skater's Name: _____ Coach: _____

Date: _____ Time: _____ Rink: _____

Were you in a lesson during the five attempts? Y / N

Were you being video taped during the attempts? Y / N

If yes, by whom: _____

Specific Jump: _____

Attempt Number	Score (Min of 1 point; Max of 6 points each)	Did you use your self-talk strategy prior to the attempt? (Y/N)	Did you say it out loud or inside your head?	Additional Comments
1				
2				
3				
4				
5				

Scoring System**1 Point** – Poor Attempt**2 Points** – Incomplete rotation; but on one foot**3 Points** – Landed backwards, but lost the edge and fell**4 Points** – Landed backwards, and flipped out of it, but stayed up; or, a good 2-foot attempt (2-footing it was hardly noticeable)**5 Points** – Landed but with a hand down or a control problem (but stayed on one foot)**6 Points** – Landed clean

Appendix L

Intervention Recording Sheet -Coach

Coach: _____ Skater: _____

Date: _____ Time: _____ Rink: _____

Was the skater in a lesson during the attempts? Y / N

Was the skater being video taped during the attempts? Y / N

If yes, by whom: _____

Specific Jump: _____

Attempt Number	Score (Min of 1 point; Max of 6 points each)	Did you encourage your skater to use his/her self-talk prior to attempt? (Y/N)	Additional Comments
1			
2			
3			
4			
5			

Scoring System**1 Point** – Poor Attempt**2 Points** – Incomplete rotation; but on one foot**3 Points** – Landed backwards, but lost the edge and fell**4 Points** – Landed backwards, and flipped out of it, but stayed up; or, a good 2-foot attempt (2-footing it was hardly noticeable)**5 Points** – Landed but with a hand down or a control problem (but stayed on one foot)**6 Points** – Landed clean

Appendix M

Intervention Recording Sheet - Researcher

Observer: _____

Coach: _____

Skater: _____

Date: _____ Time: _____ Rink: _____

Was the skater in a lesson during the attempts? Y / N

Was the skater being video taped during the attempts? Y / N

If yes, by whom: _____

Specific Jump: _____

Attempt Number	Score (Min of 1 point; Max of 6 points each)	Additional Comments
1		
2		
3		
4		
5		

Scoring System**1 Point** – Poor Attempt**2 Points** – Incomplete rotation; but on one foot**3 Points** – Landed backwards, but lost the edge and fell**4 Points** – Landed backwards, and flipped out of it, but stayed up; or, a good 2-foot attempt (2-footing it was hardly noticeable)**5 Points** – Landed but with a hand down or a control problem (but stayed on one foot)**6 Points** – Landed clean

Appendix N

Social Validity Questionnaire - Participant

Skater: _____ Date: _____

Self-talk / Key words = ST / KW

Please answer the following questions concerning the self-talk strategy. For some questions please circle the number, or word, that best answers the question. For other questions please write in your answers.

- | | 1 | 2 | 3 | 4 | 5 |
|---|--------------------------------|---|---|---|-----------------------|
| | Definitely
not helpful / No | | Somewhat
helpful / To some
extent | | Very
helpful / Yes |
| 1. Assessing and recording your performance after each attempt | 1 | 2 | 3 | 4 | 5 |
| 2. Having the researcher observe, score, and record your performance | 1 | 2 | 3 | 4 | 5 |
| 3. Having your coach observe, score, and record your performance | 1 | 2 | 3 | 4 | 5 |
| 4. Developing the ST / KW strategy | 1 | 2 | 3 | 4 | 5 |
| 5. Using the ST / KW strategy before each jump | 1 | 2 | 3 | 4 | 5 |
| 6. Did you warm-up the same way each session? | 1 | 2 | 3 | 4 | 5 |
| 7. Did you say the ST / KW before each of the five trails? | 1 | 2 | 3 | 4 | 5 |
| 8. Did you perform the 5 attempts and fill out a score sheet at
each free skate session that you attended? | 1 | 2 | 3 | 4 | 5 |
| 9. Of the free skate sessions you did not perform and score the 5 attempts, Why not? | <hr/> <hr/> <hr/> | | | | |
| 10. Did you say the ST / KW before other attempts of the target
jump in practice ? | 1 | 2 | 3 | 4 | 5 |
| 11. Did you use the ST / KW for your target jump in
your program ? | 1 | 2 | 3 | 4 | 5 |
| 12. Did you enjoy using the ST / KW in this study? | 1 | 2 | 3 | 4 | 5 |

13. Do you feel that the study procedures interfered with your
your regular practice routine? 1 2 3 4 5
14. Do you feel that you are physically capable (i.e., strength and
technique) of performing the target jump? 1 2 3 4 5
15. Do you feel that using the ST / KW strategy helped you to
improve your jumping **performance**? 1 2 3 4 5
16. Do you feel that using the ST / KW strategy helped you to
improve your jumping **consistency**? 1 2 3 4 5
17. Why do you feel that the ST / KW **did or did not** (Circle one) help you with your
target jump performance and consistency?

-
-
18. Do you think you will continue to use the ST / KW? 1 2 3 4 5
19. Are you using ST / KW with other figure skating elements? 1 2 3 4 5

If so, which elements: _____

20. What things did you **like** about the ST / KW strategy?

-
-
21. What things did you **not like** about the ST / KW strategy?

-
-
22. Overall how would you rate your experience in the study?

Negative -----Neutral -----Positive

23. Would you like the opportunity to re-evaluate and change
your ST / KW? Yes No
24. If not, can I have your permission to contact you within three months following the
completion of the study for a brief follow-up meeting and a follow-up data collection
session (i.e. 5 attempts of the target jump during one or two free skate sessions)
Yes No

25. Additional Comments: _____
-

Appendix O

Social Validation (Participants) – Rating Components of the ST Package and Study

Component	P1	P2	P3
Recording jump performance	4	3	4
Having researcher observe/score	3	4	2
Having coach observe/score	3	3	4
Developing ST/KW strategy	4	5	4
Using ST/KW strategy	3	4	4
Warm-up routine the same	3	5	5
Say the ST/KW before each jump trial	4	5	5
Perform and score 5 attempts for each free skate session	4	3	5
Why didn't you perform and score 5 attempts at some sessions	Lesson; program run-through	Jump wasn't working properly	Prog. run-through; element wasn't working; was ill
ST/KW were used before other attempts of the target jump in practice	4	4	5
ST/KW were used before attempts of the target jump in program	2	5	4
Enjoy using the ST/KW	4	4	4
Feel the study procedures interfered with your regular practice routine	3	4	3
Physically capable to successfully land target jump	4	5	5
Using the ST/KW improved jumping performance	3	5	3
Using the ST/KW improved jumping consistency	4	4	3
Continue to use the ST/KW	4	4	4
Using ST/KW with other figure skating element	5 - Trp Sow; Trp Tow	5 - Dbl Flip; Dbl Loop	4 - Spins; Dbl Flip; Dbl Axel; ftwork;
What you liked about the ST/KW strategy	Kept me focused & terms were simple to remember & apply	Made me keep my attention on the jump	Organized my thoughts before & during the element
What you did not like about the ST/KW strategy	Changed my practice schedule around a bit which interfered with my other elements	Sometimes it was too much to think about	Five attempts per session could sometimes interfere with practice
Note.	1=Definitely not helpful / No	2=Somewhat helpful / To some extent	3=Very helpful / Yes

Appendix P

Social Validity Questionnaire – Coach

Name: _____ Skater: _____

Date: _____

Please answer the following questions concerning the self-talk strategy. For some questions please circle the number that best answers the question. For other questions please write in your answers.

- | | 1 | 2 | 3 | 4 | 5 |
|--|--------------------------------|---|---|---|-----------------------|
| | Definitely
not helpful / No | | Somewhat
helpful / To some
extent | | Very
helpful / Yes |
| 1. Do you feel that the development of the self-talk strategy required a lot of your time and energy? | | | | | 1 2 3 4 5 |
| 2. Do you feel that you were adequately able to assess and score your skaters jump performance? | | | | | 1 2 3 4 5 |
| 3. Do you feel that the self-talk strategy helped to improve the jumping performance and consistency of your skater? | | | | | 1 2 3 4 5 |
| 4. Are you satisfied with the amount of improvement? | | | | | 1 2 3 4 5 |
| 5. Do you feel that the self-talk strategy would benefit other figure skaters? | | | | | 1 2 3 4 5 |
| 6. Have you used this type of self-talk strategy in the past? | | | | | 1 2 3 4 5 |
| 7. Will you develop a self-talk strategy to help your other skaters improve their skills in the future? | | | | | 1 2 3 4 5 |
| 8. Would you feel comfortable developing a self-talk strategy by yourself? | | | | | 1 2 3 4 5 |
| If not, what additional information or help would you require? | | | | | |
| _____ | | | | | |
| _____ | | | | | |

9. Which aspects of the self-talk strategy did you **like**?

10. Which aspects of the self-talk strategy did you **not like**?

11. Additional Comments:

Thanks!

Appendix Q

Social Validation (Coach) – Rating Components of the ST Package and Study

Component	P1	P2	P3
Development of ST/KW strategy required a lot of time and energy	3	3	3
You were adequately able to assess and score jump performance	4	4	4
ST/KW strategy helped improve jump performance and consistency	2	4	4
Satisfied with amount of improvement	2	2	4
ST/KW strategy would benefit other figure skaters	5	5	5
Used this ST/KW strategy in the past	5	5	5
Develop a ST/KW strategy to help other skaters improve skills	5	5	5
Feel comfortable developing a ST/KW strategy by yourself	5	5	5
Aspects of the ST/KW strategy that you liked	Skater has trouble getting into strong positions in the air – I think the ST assisted in this	Creates more consistency & ability to cue into the proper time to focus on helpful strategies	Helped skater actually think – she was pretty scattered with her thoughts
Aspects of the ST/KW strategy that you did not like	Too short time to implement and see many changes – It is too bad we didn't get more into ST sooner	There was nothing I did not like	I think that the skater should have said her words more out loud – but she was self-conscious doing so
Additional Comments	I wish I knew a way to get skaters to forgive themselves when they are at that sometimes long and at times never ending road to success!	More time would have been great. I felt I should have been more focused, but the time needed to be spent on programs for competitions	I'm sorry the girls have quit skating as now for my interest I won't know if it would have helped in the future.
General Comments	Thanks 'D' for trying to help us! I really think that if done early enough in a skaters training these methods will create 'Winners' (in all ways). Thanks so much, you have lots of great information.		

Note. 1=Definitely not helpful / No 2=Somewhat helpful / To some extent 3=Very helpful / Yes