Canadian Curling Coaches' Use of Psychological Skills Training

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This thesis is dedicated to all of those individuals who have, and continue to provide me with support and motivation as I continue to pursue my life goals. Without you, this journey would be less meaningful and rewarding.

Acknowledgements

Abstract

Horn's (2008) model of coaching effectiveness proposes a series of direct

relationships between the beliefs and values of coaches, their behaviours, and the

perceptions of their athletes. One specific area of coaching behaviour that is in need of

more research is their use of psychological skills training (PST). The purpose of this

study was to examine the relationship between the beliefs and behaviours of curling

coaches with respect to PST, and the perceptions of their athletes. In collaboration with

the Canadian Curling Association, data was collected from a national sample of 115

curling teams with varying levels of competition and experience. One hundred and fifteen

coaches completed PST attitude (SPA-RC-revised) and behaviour (MSQ-revised)

measures, while 403 athletes completed two perception measures (CCS and S-CI).

Interclass correlation coefficients (ICC) were calculated to ensure intra-team consistency.

All ICCs were positive, ranging from $r = .39$ to $.56$, and significant at the $p < .01$ level. A

series of multiple regressions were performed. Three of the four regression models were

significant, with coaches' PST behaviours accounting for 16% of the variance in athletes'

evaluation of their coaches' competencies (GCC). The models for athletes' Physical-

Sport Confidence (P-SC) and Cognitive-Sport Confidence (C-SC) accounted for 15% and

36% of the variation, with GCC and coaches' PST behaviours both being significant

predictors of the models. After statistically controlling the influence of GCC, coaches'

PST behaviours accounted for 3% and 26% of the variation in athletes P-SC and C-SC.

These results provide partial support for Horn's (2008) model of coaching effectiveness,

and offer new insight into the benefits of coaches' use of sport psychology-related

training behaviours.

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I. Chapter One

1.1. Introduction

Early research in sport psychology focused primarily on the psychological skills

of elite level performers (Mahoney, Gabriel, & Perkins, 1987; Williams, 1986). Within

sport literature, these skills have been defined as "learned or innate characteristics of the

athletes that make it possible or even likely that she will succeed in sport." (Cox, 2007, p.

328). Furthermore, these skills "enable an athlete to reach a state of mind which will

prevent negative, and distracting, thoughts interfering with physical performance (Bull,

Albinson, & Shambrook, 2002, p.3). The results established by Mahoney and colleagues

(1987) and Williams (1986) presented a clear distinction between the psychological

characteristics of elite athletes compared to their less successful counterparts.

Specifically, elite level athletes were found to possess greater self-confidence, attentional

focus, motivation, commitment, and use of imagery (Mahoney et al.; Williams, 1986).

Many studies have since examined the development and implementation of

various intervention strategies that focused on enhancing the psychological skills of

athletes of all backgrounds. Results of these studies presented a wealth of support for the

benefits provided by the intervention strategies. Increases in levels of concentration

(Schmid, Peper, & Wilson, 2001; Hardy, Jones, & Gould, 1996), self-confidence

(Singleton & Feltz, 1999; Feltz, 1994), and imagery (Holmes & Collins, 2001; Vealey &

Greenleaf, 1998) were among the many outcomes of the intervention strategies. Not only

were researchers successful in improving many of the psychological characteristics of

athletes, they were ultimately successful in linking these mental skills, and subsequent

interventions, to athletic performance.

Within the past two decades, a breadth of research has emerged presenting the vast benefits of mental skills on the performance of athletes of all ages and skill levels, within a wide range of sports. These skills include, but are not limited to, goal setting (Kyllo & Landers, 1995), imagery (Martin, Mortiz, & Hall, 1999; Murphy, 1994), techniques for reducing anxiety (Kerr & Leith, 1993; Crocker et al., 1988), enhancing concentration (Jackson & Csikszentmihalyi, 1999; Gould, Eklund, & Jackson, 1992c), and building self-efficacy (Cumming, Clark, McCullaugh, Ste-Marie, & Hall, 2005; Vargas-Tonsing, Myers, & Feltz, 2004). The benefits of mental practice, or the mental rehearsal of a motor skill, are no longer a question of debate (Driskell, Copper, & Moran, 1994; Feltz & Landers, 1983). All things being equal, the athlete with the greater mental skills and cognitive preparation will be successful more times than not (Weinberg & Gould, 2003).

Unfortunately, some athletes tend to disregard the mental training component of their overall athletic preparation. Although several explanations exist for this trend (Weinberg & Gould, 2003), Gould and Eklund (1991) pointed out that many athletes simply do not believe they have control of their cognitions, and that mental skills are strictly a result of heredity, similar to height or eye colour. In order to increase the overall effectiveness and longevity of their psychological skills, athletes must engage in psychological skills training (PST). In short, PST refers to the consistent and systematic practice of psychological skills (Martens, 1987). In order for athletes to fully appreciate and recognize the importance of PST, it is imperative that this information be somehow conveyed to them (Gould, Damarjian, & Medbery, 1999). It has been argued that the only way athletes are going to be exposed to psychological skills on a regular basis is if their

coaches implement these skills into their daily training and competitive preparation (Gould, Damarjian et al., 1999). Unfortunately, a recent study showed that 98.4% of coaches of carded athletes recognized a need for more support in the area of sport psychology (Reade, Rodgers, Holt, Dunn, Hall, Stolp, Jones, Smith, & Baker, 2008).

In recent years, the Coaching Association of Canada (CAC) has acknowledged the significance of instilling adequate coach education programs that include sport psychology material, such as mental skills development and the promotion of PST programs. The CAC currently requires that all coaches successfully complete an introductory workshop in their sport from the National Coaching Certification Program (NCCP) before they can begin coaching athletes of any age or skill level (Coaching Association of Canada [CAC], 2005). Along with other invaluable information, the materials covered in the various workshops provide coaches with a brief outline of the benefits of PST in their sport, and its impact on athletic performance. Each national sport organization is responsible for its own content. However, across all sports, as the level of certification increases, the sport psychology content of the workshops shift from teaching basic mental skills, to emphasizing the psychology of performance (CAC, 2005).

1.2. Statement of the Problem

Psychological skills training has been recognized as an invaluable training tool by both the NCCP (CAC, 2005) and coaches all of all levels (Gould, Murphy, Tammen, & May, 1989; Ottley, 2000; Sullivan & Hodge, 1991). However, the literature indicates that many coaches exclude PST from the training and preparation of their athletes (Gould, Damarjian et al., 1999; Grobbelaar, 2007). There have been a few possible explanations for this trend, including stigmas towards sport psychology (Martin, Kellmann, Lavallee,

& Page, 2002; Martin, Wrisberg, Beitel, & Lounsbury, 1997; Ravizza, 1988; Zakrajsek & Zizzi, 2007), a lack of sport psychology related education (Gould, Damarjian et al.; Gould & Eklund, 1991; Gould, Medbery et al., 1999; Ottley, 2000), and financial limitations (Grobbelaar, 2007).

Among the coaches who do implement some form of PST with their athletes, there is often a large disparity between the time devoted to mental training and to physical training (Gould & Ecklund, 1991). It has been proven that both the predispositions and attitudes of coaches towards PST, largely influences the perceived value and importance of these skills within their athletes (Gould, Damarjian et al., 1999; Martens, 2004; Martin et al., 2001; Orlick & Partington, 1987). Martens (2004) suggested that in order to succeed as a coach, it is essential to become a student of sport psychology. Unfortunately, Gould, Damarjian and colleagues (1999) indicated that many coaches do not have an adequate background in sport psychology or in the practical application of PST. This is very alarming considering that roughly 95% of coaches believed their athletes would benefit from some form of PST (Sullivan & Hodge, 1991), and that roughly 80 percent of their athletes suffer from some form of mental setback that prevents them from achieving their playing potential (Gould, Medbery et al., 1999).

Other than a few case studies examining coaches' use of mental skills, very little research has been devoted to helping coaches develop PST with their athletes (Gould, Medbery et al., 1999; Kimiecik & Gould, 1987; Thelwell et al., 2008; Wrisberg, 1990). Even though coaches, in general, are exposed to mental training throughout their certification process, it has been stressed that teaching coaches specific mental skills and drills is simply inadequate (Gould, Damarjian et al., 1999). Sport participants,

particularly coaches, must make an effort to acquire better procedural knowledge of sport

psychology, and the process of PST (Gould, Damarjian et al.; Sullivan & Hodge, 1991).

The coaching process is complex (Bloom, 2007; Gilbert & Trudel, 2004a; Gould,

Damarjian et al., 1999), and as a result there is a need for research to clarify the factors

that are conducive to overall coaching effectiveness (Horn, 2008, Lyle, 2002). Coaching

behaviours are suggested to be the central point of the coaching process (Horn, 2008),

and should thus be examined in more depth to establish a better understanding of why

they occur, and their effects on athletes. Research exploring specific training methods

employed by coaches, specifically PST, is needed to provide the literature with additional

insight into the PST process, and the consequential outcomes related to athletes.

1.3. Purpose of the Study

This study seeks to better understand the relationship between the PST attitudes

and behaviours of curling coaches in Canada, and the consequences on athletes'

interpretations of their coaches and their self-confidence. As a result, the primary purpose

of the present study is twofold – theory testing and theory building. Firstly, this study

seeks to contribute to the existing body of knowledge regarding the use of PST among

coaches. The aforementioned theoretical relationships will be examined according to the

links proposed within Horn's (2008) working model of coaching effectiveness. The goal

is to provide Horn's (2008) model with additional support, and increase its ecological

validity across sports, specifically to the sport of curling. According to Jowett and

Poczwardowski (2007), this is an integral part of research; science requires the

replication of studies in order to increase the validity and reliability of conceptual models

and frameworks that are based on theoretical background (Jowett & Poczwardowski, 2007).

Next, a primary purpose of this study is theory building. More specifically, this study seeks to explore and gain additional understanding regarding a relatively untapped area of coaching, their role as PST providers. Although Horn's (2008) model proposes theoretical rationale for the relationships in question, it is still uncertain whether this model can be applied across the realm of coaching. In addition, this study will examine the nature of the link between coaches' behaviours (i.e., PST behaviours) and athletes' self-confidence within the context of PST. According to Horn (2008), within the context of coaching effectiveness this relationship is indirect. Finally, a secondary purpose of this study is to provide the Canadian Curling Association with direct feedback from coaches and athletes regarding the current situation of PST in curling, and promote the expansion of more in depth and structured coach education programs specific to curling, based on the promotion of sport psychology.

1.4. Significance of the Study

As per the recommendations highlighted by Gilbert and Trudel (2004b), this is a mutlifocus study on coaching that combines the internal processes and overt behaviours of coaches within the athletic training context. "Research that combines multiple focus areas, such as coaching behaviour and thoughts, has been advocated, as it provides a more in-depth and ecologically valid portrait of coaches, and the coaching process" (Gilbert & Trudel, 2004b, p. 395). Furthermore, the authors noted that although the bulk of coaching literature focuses on the behavioural analysis of coaches, a relatively limited body of research exists describing the consequences of their behaviours.

In line with Gilbert and Trudel (2004b) and Bloom (2007), there is dearth of coaching research that includes the additional insight of their athletes. It has been suggested that research should focus specifically on how coaches' behaviours, including training behaviours, cultivate athletes' self-efficacy (Chelladurai, 2007). This study not only examines the PST attitudes and behaviours of coaches, it also takes into account the consequential perceptions of their athletes, such as self-efficacy. It has been noted that research is typically restricted to the study of psychological behaviours and processes of sport participants during competition, even though athletes spend more time training than competing (Feltz, Short, & Sullivan, 2007). Therefore, this study will provide a better understanding of the effects of coaches' use of specific training behaviours.

1.5. Delimitations

1.5.1. Context of Curling

This study is delimited to the sport of curling, and therefore it may be difficult to generalize the results obtained by the samples of participants. Participants in this study consisted of intact curling teams. Typically, curling teams are composed of one coach, four active players (i.e., lead, second, vice, and skip) and an alternate. For the purpose of this study, teams were said to be intact so long as they consisted of one coach and a minimum of three athletes. It has been suggested that both the sociocultural context (Li & Lee, 2004) and organizational climate (Chaumeton & Duda, 1988; Haliburton & Weiss, 2002; Jambor & Zhang, 1997) of a sport will have a significant impact on the coaching process. As a result, there is reason to believe that the context of the sport of curling will have an influence on the theoretical relationships being examined in this study (Horn, 2008). Specific context-related variables that could have influence on this study include

level competition and the role of the coach with regards to athletic training and involvement during competition.

As per the national standard requirements for coaches in all sports, curling coaches must successfully complete a minimum NCCP accreditation. The coach development process follows the new NCCP model that is made up of three streams – community, competition, instruction – and is composed of a total of eight contexts, each with its own coaching requirements (CCA, 2008). These contexts include community initiation, community ongoing participation, competition introduction, competition development, competition high performance, instruction beginners, instruction intermediate performers, and instruction advanced performers (CCA, 2008). Also, to ensure that all curling coaches are aware of their responsibilities when playing the game, the CCA has adopted a coaching code of ethics as an official supplement to the rules of curling (CCA, 2008).

A curling coach has some of the same qualities as coaches in other sports; however, it is important to note that the role of a curling coach is very unique. Unlike many other sports in which the coach is an active participant during the game (i.e., calling plays, making substitutions), a curling coach is required to sit off the ice, among the spectators, during competition (Weeks, 2006). Even though there are still ways for coaches to influence the performance of their team from this location, their coaching ability during competition is limited (Weeks, 2006). As a result, most of a curling coach's work takes place before or after a game, such as during training sessions, pre-game warm-ups, and post-game meetings. Often, as the level of competition increases towards the elite rankings, the role of the curling coach becomes increasingly more passive.

1.5.2. Self-Report Questionnaires

Next, this study is delimited to the use of self-report questionnaires. This type of questionnaire was used to assess the theoretical relationships between coaches' PST beliefs and behaviours, athletes' interpretations of their coaches, and their self-perceptions. Due to the nature of self-report questionnaires, the correspondence between what participants say and what they do must be considered. It has been noted in previous research that both cognitive dissonance (Gould, Damarjian et al., 1999) and social desirability (Gould, Hodge, Peterson, & Petlitchkoff, 1987) have been found to create a discrepancy between individuals' cognitions (i.e., interpretations of their behaviours or the behaviours of others) and their actual behaviours.

1.6. Limitations

All participants in this study have volunteered their participation. Therefore, a limitation may be a biased sample of volunteers. It is a distinct possibility that only individuals with an interest in sport psychology, or any related fields, elected to participate upon being informed of the topic of the study. Subsequently, the participants in the study could have produced a biased sample. This limitation is common with other PST studies that have examined similar research objectives (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999). Also, because of the lack of psychometrically validated PST instruments, questionnaires that were used to measure coaches' PST attitudes and behaviours were modified versions of scales used in prior research (Bull, Albinson, & Shambrook, 2002; Zakrajsek & Zizzi, 2007). Unfortunately there is not one instrument that can fully and completely represent and measure all the factors and relationships within Horn's (2008) model coaching effectiveness (Vealey, 2005). That

being stated, a final limitation to this study pertains to the selection of instruments. Four instruments were selected for this study based on their intimacy with PST. According to the nature of the study, it is possible that other instruments could have produced different findings.

1.7. Research Objectives

The research objectives of the present study are as follows:

1. Determine if coaches' PST behaviours can be significantly predicted by their opinions/attitudes of PST;

2. Determine if athletes' interpretation of their coaches' competencies can be significantly predicted by their coaches' PST behaviours;

3. a) Determine if athletes' self-perceptions can be significantly predicted by their interpretations of their coaches' competencies;

3. b) After accounting for the influence of athletes' interpretations of their coaches' competencies, determine if athletes' self-perceptions can be significantly predicted by their coaches' use of PST.

1.8. Definition of Terms

1.8.1. Psychological Skills

"Learned or innate characteristics of the athlete that make it possible or even likely that she will succeed in sport" (Cox, 2007, p. 328). These skills also "enable an athlete to reach a state of mind which will prevent negative, and distracting, thoughts interfering with physical performance" (Bull et al., 2002, p. 3). Psychological skills include, but are not limited to, mental skills, and incorporate both cognitive and behavioural processes.

1.8.2. Psychological Skills Training (PST)

"The systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical activity self-satisfaction" (Weinberg & Gould, 2003, p. 242). Psychological skills training includes, but is not limited to, mental skills training.

1.8.3. PST Provider

A PST provider is considered any individual in charge of the development and implementation of PST with sport participants. Often PST is provided by a certified sport psychology consultant. However, coaches, teachers, and exercise leaders that use psychological skills and strategies on a regular basis can be considered PST providers (Weinberg & Gould, 2003).

II. Chapter Two

2.1. Literature Review

Participation in sport requires strong psychological involvement from all participants, including both athletes and coaches (Feltz, 1978; Gould, 1985; Martens & Gould, 1979). Researchers have recognized the importance of developing resilient mental skills in athletes, and have since provided coaches with specific literature to facilitate the acquisition and development of these invaluable skills (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999; Orlick, 1982; Orlick, 1986). Others have spent their time studying the factors that contribute to coaching excellence, in order to better understand the professional development (Schinke, Bloom, & Salmela, 1995), cognitions (Bloom, Stevens, & Wickwire, 1995; Valle & Bloom, 2005) and behaviours (Bloom, Durand-Bush, & Salmela, 1997) of expert coaches. Gould, Damarjian and colleagues proposed that athletes will only reach their full mental and physical potential through effective coaching. Coaching effectiveness is an abstract concept that has been highlighted by Horn's (2008) conceptual model. The following presents an in depth analysis of Horn's (2008) working model of coaching effectiveness, and aims to provide the reader with a theoretical and empirical overview of coaching research according to the specific relationships outlined by the author.

2.1.1. A Working Model of Coaching Effectiveness

In line with Chelladurai (1978, 1990, 1993) and Smoll and Smith's (1989) models of leadership effectiveness, Horn (2008) created a model that outlines all factors contributing to the context of coaching effectiveness (see Figure 2.1). This model incorporates a variety of elements from other conceptual theories from the developmental

and social-cognitive literature, including the attribution theory (Weiner, 1986, 1992), perceived control theory (Skinner, 1995, 1996), and self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) (Horn, 2008). Horn's (2008) model depicts ten factors that influence the behaviour of coaches, and highlights the possible outcome-variables associated with those behaviours. This model can be characterized by the following three principle constructual relationships: 1) antecedents of coaches' behaviours, 2) athlete-related variables, and 3) outcomes of coaches' behaviours.

    2.1.1.1. Antecedents of coaches' behaviours. Horn (2008) proposes that coaches' behaviours within the context of athletic training and competition do not occur in a vacuum (Horn, 2002). Rather, these behaviours are the result of a select group of antecedent variables, including the sociocultural context (box 1), organizational climate (box 2), and coaches' personal characteristics (box 3). Horn (2008) suggested that the affects of the preceding variables on coaches' behaviours (box 5) are not direct, but rather mediated by coaches' expectancies, values, beliefs, and goals (box 4).

    The first component of Horn's (2008) model of coaching effectiveness is the sociocultural context of the sport environment. This model suggests that the sociocultural context of athletic training and competition has a direct influence on several other factors within the model. These factors include the organizational climate (box 2), coaches' personal characteristics (box 3), coaches' expectancies, values, beliefs and goals (box 4), and athletes' perceptions, interpretation, and evaluation of their coaches' behaviour (box 5). In a content analysis of sport and exercise psychology journals, Ram, Starek, and Johnson (2004), found that there is dearth of research on the effects of race, ethnicity, and sexual orientation on the behaviours of sport participants. Although there has been little

research to support the links proposed by Horn (2008), Li and Lee (2004) found that achievement goal perspectives differed as a result of cross-cultural variation in athletes. Horn (2008) proposed that similar links between coaches' sociocultural background and their expectancies, values, beliefs, and goals can be expected.

Organizational climate (box 2), also referred to as the particular sport program structure (Horn, 2008), has been indirectly linked to coaches' behaviours. Research has found that coaches' employed different leadership behaviours based on their sport level (Chaumeton & Duda, 1988; Haliburton & Weiss, 2002; Jambor & Zhang, 1997). Specifically, these coaches exhibited more ego-involving behaviours with older age levels, and more democratic behaviours with younger age levels. Gilbert and Trudel's (2004a) qualitative study on coaching behaviours provided additional support for the theoretical link between organizational climate and coaches' behaviours. The results of this study revealed that athletes' age level and competitive level were stated by all six coaches to be critical factors that influenced their role as coaches, specifically their approach to coaching practices and game situations (Horn, 2008). The relationship between sport context (i.e., sociocultural context and organizational climate) and coaches' behaviours has also been theoretically supported by Vealey's (2005) three-ring circus model of leadership. Similar to Horn's (2008) model, Vealey (2005) suggested that effective leadership requires coaches to consider the context (i.e., external/internal environment) in which they work in order to successfully adapt their coaching behaviours.

Coaching behaviours are also said to be influenced by the personal characteristics of coaches (box 3). Horn (2008) suggested that this link, similar to the others, is indirect

and mediated by box 4 (i.e., coaches' expectancies, values, beliefs, and goals). Some personal characteristics that have been found to influence the internal processes of coaches include their self-reflectiveness, critical thinking aptitude, decision making abilities, and intrinsic motivation (Frederick & Morrison, 1999; Strean, Senecal, Howlett, & Burgess, 1997). In addition to the aforementioned characterisitics, gender has also been proven to affect the values and beliefs of coaches (Zakrajsek & Zizzi, 2007). Although much of the research examining gender and attitudinal beliefs is focused on athletes (Martin, 2005; Martin et al., 1997), Zakrajsek and Zizzi (2007) found that female coaches were more accepting of various training methods than were male coaches.

A specific form of belief held by coaches is coaching efficacy. Coaching efficacy is defined as "the extent to which coaches believe they have the capacity to affect the learning and performance of their athletes" (Feltz et al., 2007, p.153). In line with Bandura's (1977) concept of self-efficacy, Feltz and colleagues (1999) indicated that coaching experience, a personal characteristic of the coach, proved to be a viable source of coaching efficacy. These findings have been supported by several other studies examining sources of coaching efficacy (Marback, Short, Short, & Sullivan, 2005; Myers, Vargas-Tonsing, & Feltz, 2005; Short, Smiley, & Ross-Stewart, 2005; Sullivan, Paiement, Brachlow, & Bagnell, 2005).

Horn's (2008) model also proposes a direct relationship between coaches' expectancies, values, beliefs and goals (box 4), and their behaviour (box 5). This link has been supported by a collection of empirical research (Dweck, 1986; Feltz et al., 1999; Nicholls, 1984, 1992; Sinclair & Vealey, 1989). In a study examining the frequency and type of feedback of junior high school coaches, Horn (1984) found a significant

difference with regards to coaching behaviours in game situations. Coaches were found to provide more feedback to their high-expectancy athletes, while they engaged in more technical instruction with their low-expectancy athletes. Moreover, coaches utilized more punishment behaviours with their high-expectancy athletes compared to their low-expectancy counterparts. Similar results were established with a sample of elite field hockey coaches (Sinclair & Vealey, 1989), and collegiate head coaches (Soloman et al., 1996).

Coaches' belief in their ability to affect the learning and performance of their athletes has also been linked to influence their behaviours (Feltz, et al., 1999). Specifically, Feltz and colleagues' findings revealed that among a sample of high school male basketball coaches, those with higher levels of efficacy engaged in more praise and encouragement behaviours, and fewer instructional and organizational behaviours (Feltz et al., 2007). More recently, support has been established for the influence of coaches' beliefs on their subsequent behaviours, such as commitment and leadership style (Sullivan & Kent, 2003). Finally, the link between coaches' goals and their behaviours is established with research examining the tenets of achievement goal orientation theory (Ames, 1984, 1992a; Dweck, 1986; Nicholls, 1984, 1992). This suggests that coach behaviours in practice and game situations will be directly influenced by their goal orientation, either task-oriented or goal-oriented.

2.1.1.2. Athlete-related variables. The second theoretical premise of Horn's (2008) model outlines the role of all athlete-related variables within the framework of coaching effectiveness. These variables are highlighted on the right side of the model in Figure 2.1. Horn (2008) suggested that athletes' performance and behaviour (box 6) is

influenced by several factors, including their personal characteristics (box 7), perceptions of their coaches' behaviour (box 8), self-perceptions, beliefs, and attitudes (box 9), and levels and type of motivation (box 10). In addition to the linear relationship among athlete-related variables, Horn's (2008) model proposes that both athletes' personal characteristics, and performance and behaviours directly influence coaches' internal processes (box 4).

According to Horn (2008) the right side of the model, which depicts the athlete-related variables, is initiated by the personal characteristics of athletes. Research has suggested that these personal characteristics (box 7) have been found to affect the sport training context. Chaumeton and Duda (1988) established empirical support for the influence of athletes' age on their perceptions of their coaches' behaviours. Results of their study indicated that as the age of the athletes' increased, their perception of their coaches' behaviour changed from a task-involving, to a more ego-involving behaviour. In a series of studies, Kenow and colleagues (Kenow & Williams, 1992; Williams et al., 2003) found anxiety to be among a group of personal characteristics influencing athletes' perception of their coaches' behaviours. The authors concluded that athletes with higher levels of anxiety were more likely to negatively evaluate behaviours exhibited by their coaches. Other personal characteristics, including intrinsic motivation (Amorose & Horn, 2000) and locus of control (Horn & Glenn, 1988) have also been linked to influence the perception of athletes toward their coaches' behaviours.

These perceptions have been shown to have a direct impact on athletes' self-perceptions, beliefs, and attitudes (Allen & Howe, 1998; Chelladurai, 1984; Riemer & Chelladurai, 1995). A series of studies examining sport leadership have indicated that

athletes' perceptions of their coaches' behaviours were significantly related to their overall satisfaction (Allen & Howe, 1998; Weiss & Friedrichs, 1986). Similarly, athletes' actual and preferred coaching behaviours were found to be directly associated with their satisfaction, commitment and motivation (Riemer & Chelladurai, 1995).

Athletes' self-perceptions, beliefs, and attitudes (box 9) is a complex factor within Horn's (2008) model that characterizes the internal processes of athletes. A specific form of belief among athletes relating to levels of confidence is self-efficacy. Self-efficacy is defined as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). According to Horn's (2008) model, athletes' internal processes are directly linked to their level and type of motivation (box 10). Vancouver, More, and Yoder (2008) provided concrete empirical support for Horn's (2008) conceptual link between these two factors. Based on previous research, Vancouver et al., (2008) outlined several theories relating the efficacy-motivation relationship (Bandura, 1997; Bandura & Locke, 2003; Kanfer & Ackerman, 2004; Kukla, 1972).

Horn's model (2008) also denotes a direct link between the self-perceptions, beliefs, and attitudes of athletes (box 8), and their subsequent athletic performance and behaviour (box 6). Among the many forms of expectancy beliefs among athletes, self-efficacy has been considered to be the most popular in present sport psychology literature (Ambrose & Kulik, 1999; Donovan, 2002; Latham & Pinder, 2005). Much research has focused specifically on studying the effects of self-efficacy on athletic performance. The bulk of this research has been studied largely in part by Feltz and her colleagues (Feltz, 1982, 1988a; Feltz, Landers, & Raeder, 1979; Feltz & Mungo, 1983), and Weinberg and

his colleagues (Weinberg, 1985; Weinberg, Gould, & Jackson, 1979; Weinberg, Gould, Yukelson, & Jackson, 1981; Weinberg, Yukelson, & Jackson, 1980). The results of these studies have provided overwhelming support for the link established by Horn (2008) in her model.

The final box in Horn's (2008) working model of coaching effectiveness is the athlete's level and type of motivation (box 10). The model proposes a direct relationship between this factor and athletes' performance and behaviour (box 6). With regards to the influence of motivation on athlete behaviour, Gagné, Ryan, and Bargmann (2003) found that intrinsic motivation was a significant predictor of attendance to practice with female gymnasts. Similar results were established with Canadian adolescent swimmers (Pelletier, Fortier, Vallerand, & Briere, 2001) and French handball players (Sarrazin, Vallerand, Guillet, Pelletier, & Curry, 2002), highlighting intrinsic motivation as the primary predictor of continued sport participation.

Motivation has also been linked to athletic performance. In 1996, Beauchamp, Halliwell, Fournier, and Koestner examined the effects of introducing a cognitive-behavioural psychological skills training program to a sample of novice golfers. The cognitive-behavioural program consisted of a motivation phase which included goal setting. The results of the study revealed an increase in both the intrinsic motivation and putting performance of participants, as well as a positive correlation between the two variables. Similar findings were presented with swimming performances (Pelletier, Vallerand, Briere, & Blais, 2006) and a basketball dribbling task (Simons, Dewitte, & Lens, 2003).

Not only do athlete-related variables have direct influence on one another, Horn (2008) proposed that performance and behaviours of athletes (box 6) also affect coaches' internal processes (box 4). Feltz and colleagues (1999) provided support for this relationship as a result of their study on the preliminary investigation and development of the Coaching Efficacy Scale (CES). Feltz et al. highlighted a theoretical link between a group of sources, including prior success (won-loss record), and coaching efficacy. The prior success of coaches can alternatively be viewed as the previous performances of their athletes (box 6). As a result, coaches' belief in their ability to affect the future learning and performance of their athletes is affected by athletes' performances (Feltz et al.). Additional support for the sources of coaching efficacy, as proposed by Feltz et al., was provided by Myers and colleagues (2005) with a sample of Division II and III coaches.

2.1.1.3. Outcomes of coaches' behaviours. The cornerstone of Horn's (2008) model is coaches' behaviours (box 5). This includes all behaviours in practice and in game situations, leadership styles, communication styles, and the absence of specific coaching behaviours. Within the coaching literature, the majority of studies focus on the description and basic understanding of coaches' behaviours (Gilbert & Trudel, 2004b). The consequences of these behaviours are directly linked to athletes' performance and behaviours (box 6), and their perceptions, interpretations, and evaluation of their coaches' behaviours (box 8) (Horn, 2008).

Empirical research has supported the link between the behaviours exhibited by coaches, and athletes' performance (Metzler, 1989) and behaviours (Zourbanos, Hatzigeorgiadis & Theodorakis, 2007). In a study exploring the relationship between

coaches' behaviours and statements, and athletes' self-talk, the use of positive statements was found to influence athletes' use of positive self-talk (Zourbanos et al., 2007). Within the conceptual model of the coach-athlete relationship (Jowett & Poczwardowski, 2007), Jowett and colleagues established a link between coaches' behaviours and the interpersonal dynamics of the coach-athlete dyad (Jowett, 2005; Jowett, Paull, & Pensgaard, 2005). This link has also been proven to affect the behaviours of athletes, specifically their decision to participate in sport (Ewing, Seefeldt & Brown, 1996; Martens, 1997; Smith & Smoll, 2002).

Empirical data has also been established to support the link between coaches' behaviours and athletes' perceptions, interpretations, and evaluation of their coaches' behaviour. In a study performed by Zourbanos, Theodorakis and Hatzigeorgiadis (2006) examining the relationship between perceived coaching behaviour, coaches' esteem support, and athletes' positive and negative self-talk, results indicated that coaches displaying a greater degree of negative activation, evoked more negative thinking in their athletes. Comparatively, while looking at the influence of facial-verbal expression congruencies on the perception of a coach's verbal and emotional feedback, Crocker (1990) found that negative nonverbal communication by coaches negatively influenced their athletes' perceptions of the athletic event.

In summary, Horn's (2008) model of coaching effectiveness provides a detailed theoretical overview of the antecedent factors that influence coaches' behaviours, as well as the influence that these behaviours have on the performance and psychosocial development of athletes (Horn, 2008). Furthermore, this model emphasizes that the behaviours exhibited by coaches and athletes within the sport context are mediated by

both situational and individual difference variables. Therefore, Horn (2008) suggested that there is no optimal repertoire of coaching behaviours that will fit the demands of all coaching contexts. Rather, in line with Lyle (2002), this model proposes that coaching effectiveness is a "dynamic and context-dependent process that requires a multidimensional focus to capture its essence" (p.265). It is important to point out that there are many contexts within which the factors established by Horn (2008) affect the coaching process. These contexts include athletic organization, competition, and training (Coté, Salmela, Trudel, Baria, & Russell, 1995).

A specific form of training that has been associated with effective coaching is PST (Gould et al., 1989; Reade et al., 2008). Although research supports that some coaches do implement PST with their athletes (Gould & Eklund, 1991; Ottley, 2000), many do not (Gould, Damarjian et al.; Sullivan & Hodge, 1991). "Coaches are an important untapped data base of sport psychology knowledge", and it has been suggested that further research is required to better understand the psychological foundations of coaching (Gould et al., 1987, p.307).

2.1.2. Psychological Skills Training (PST)

Psychological skills training literature has focused predominantly on its effectiveness to enhance athletic performance and alter athletic behaviours (Greenspan & Feltz, 1989; Myers, Whelan, & Murphy, 1996; Vealey, 1994). Research has highlighted the use of PST among both successful athletes (Durand-Bush & Salmela, 2002; Gould, Eklund, & Jackson, 1993) and coaches (Bloom et al., 1997; Sullivan & Hodge, 1991). Also, PST programs increase the value that both athletes (Brewer & Shillinglaw, 1992; Gould, Petlichkoff, Hodge, & Simons, 1990) and coaches (Zakrajsek & Zizzi, 2007)

place on the future use of PST. Although there is an ample body of literature focusing on

the outcomes of PST (Thelwell & Greenlees, 2001; Thelwell & Greenlees, 2003;

Thelwell, Greenlees, & Weston, 2006; Thelwell & Maynard, 2003), very little research

exists that examines the PST process (Vealey, 2007).

Vealey's (2007) framework for understanding mental skills training in sport, and

Gould, Damarjian et al.'s (1999) tentative interactive framework for coaching mental

skills training in tennis are two models within the PST literature that provide a conceptual

overview of the mental skills training process. Although at first glance the two

frameworks appear conceptually different from Horn's (2008) model, they do establish a

theoretical consistency with the three principle constructual relationships outlined earlier

(i.e., 1) antecedents of coaches' behaviours, 2) athlete-related variables, and 3) outcomes

of coaches' behaviours). The proceeding section introduces the two PST frameworks, as

well as provides both theoretical and empirical support for the inclusion of PST within

Horn's (2008) model of coaching effectiveness.

   2.1.2.1. A framework for understanding mental skills training in sport. Primarily

based on her past research focusing on applied sport psychology (Vealey, 1988; Vealey,

1994; Vealey & Garner-Holman, 1998), Vealey (2007) created a framework for

understanding PST in sport (see Figure 2.2). The purpose of the framework is to aid sport

psychology providers increase their overall PST effectiveness. Moreover, the framework

makes clear distinction between PST skills and methods, which has been found to

sometimes elude sport psychology researchers and applied consultants (Vealey, 1988;

Cox, 2007). Vealey's (1988) study on the future directions in the design and

implementation of PST was a driving force for the framework. She conducted a content

analysis of PST approaches in a sample of 27 books published in North America between 1980 and 1988. Specifically, the author reviewed the target populations, content areas, and format characteristics of the PST approaches. Six areas within the literature were highlighted by Vealey (1988) based on their importance to the future directions of PST. These areas included targeting youth and coaches in addition to elite level athletes, moving beyond education to implementation, differentiating between skills and methods, using more holistic approaches, defining the practice of sport psychology based on the personal development of sport consumers, and nurturing a symbiotic relationship between theory, research, and practice. Her framework is composed of four integrated components – mental skills, mental training process, consultant effectiveness, and physical training and social-cultural influences.

2.1.2.2. A tentative interactive framework for coaching mental skills in tennis. Similar to Vealey (2007), Gould, Damarjian et al., (1999) developed a framework for coaches and educators outlining the processes that affect the understanding, teaching, and studying of PST with athletes (see Figure 2.3). This framework reflects the PST knowledge, opinions, and practice of a sample of elite United State Tennis Association (USTA) junior tennis coaches. Gould and colleagues conducted a two-part study consisting of a series of focus group interviews (Gould, Damarjian et al.) and the distribution of a PST survey (Gould, Medbery et al., 1999). Focus-group interviews were conducted to investigate why PST information was and was not being used by coaches, and to identify more effective ways to convey this information to them (Gould, Damarjian et al.).

Based on the results obtained through these qualitative inquiries, Gould, Medbery et al. (1999) created a PST survey consisting of both open- and closed-ended items. These items were grouped into seven sections – demographic information, background/education, importance of mental skills in junior tennis, mental skills taught, how to teach mental skills, opinions about PST, and opinions of PST resources. In total, 153 elite USTA junior tennis coaches completed the survey. Upon analyzing the results, the authors were able to formulate a framework composed of five interdependent components: 1) General Coach Orientation Toward Mental Skills Training, 2) Athlete Mental Skill Needs, 3) Mental Skills Training Climate, 4) Coach Mental Skills Training Knowledge, and 5) Mental Skills Training Action. Gould, Damarjian et al. highlighted that in isolation, the components would not provide optimal mental training results for coaches. Therefore, an effective coaching system able to fully understand and promote PST requires the integration of all five components of the framework (Gould, Damarjian et al.).

2.1.2.3. Purpose of the PST frameworks. As stated earlier, both frameworks provide a great theoretical and conceptual overview of the mental training process. They successfully highlight the factors that have been found, through a series of research programs, to influence the mental training environment and the effectiveness of this form of athletic training. Some of these factors are within the control of the mental training consultant (e.g., mental skills training philosophy), while others are not (e.g., parental view of mental skills). As potential outcomes of the mental training process, the frameworks point out specific skills that should be the focus of the training; they also

provide a group of mental training actions to help direct the individual in charge of the delivery of the training.

2.1.2.4. Antecedents of coaches' use of PST. The primary theoretical consistency between the two PST frameworks and Horn's (2008) model is the notion that coaches' behaviours (i.e., use of PST) within their ideal athletic training and competition context do not occur in a "vacuum". Both Vealey (2007) and Gould, Damarjian et al. (1999) proposed that there are several antecedent factors that influence coaches' decisions to use PST with their athletes. These variables include the social cultural context, the organizational climate, and coaches' personal characteristics. Similar to Horn (2008), the authors of the two frameworks also acknowledge the fact that coaches' behaviours (i.e., use of PST) are mediated by their expectancies, values, beliefs, and goals.

Vealey (2007) suggested that the mental training process (i.e. skill development and implementation) occurs within a broader social cultural context of sport. United States Olympic mental training consultant, Dr. Gloria Balague (1999, p.89), stated that, "regardless of the techniques I may be using in work with athletes, understanding the larger issues of their identities and value systems and what sport and competition mean to them in their lives plays a central role in determining the quality and effectiveness of services that I deliver". Furthermore, the sociocultural context has been found to be a primary roadblock of PST with coaches (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999). Certain subcultures within sport have created a stigmatism against sport psychology and the use of PST, distrusting its benefits and effectiveness (Martin, 2005; Martin, Lavallee, Kellmann, & Page, 2004). As a result of these beliefs, Vealey (2007) proposed that athletes and coaches utilizing the services of sport psychology consultants

are often considered to have poor self-perceptions, or exhibit negative behaviours such as

hazing, substance abuse, homophobia, hyperconformity, identity foreclosure, burnout,

and violence (Brustad & Ritter-Taylor, 1997). However, it is important to note that

research has shown that not all athletes share these same views about the service of sport

psychology consultants (Maniar et al., 2001; Van Raalte, Brewer, Brewer, & Linder,

1992).

In addition to the social cultural context, Gould, Damarjian et al.'s (1999)

framework highlights the role of outside factors/obstacles within the organizational

climate (box 2) of the PST process. Similar to Horn's (2008) model, the authors indicated

a link between the organizational climate and the coaches' behaviours. Specifically,

cooperation from the sport organization, parental views and support, and time constraints

were all cited as explanations for why coaches do and do not use PST with their athletes

(Gould, Damarjian et al.). These results were supported by Gould, Medbery et al.'s study

of mental skills training knowledge, opinions, and practices of junior tennis coaches.

In a similar vein, both PST frameworks also establish a common theoretical link

between coaches' personal characteristics (box 3) and their subsequent use of PST (i.e.,

behaviours) (box 5). This theoretical relationship is exemplified in several ways

throughout the two frameworks. The primary component of Gould, Damarjian et al.'s

(1999) framework depicts the coach's general orientation toward mental training. The

authors suggested that coaches' general orientation towards PST is mediated by their

personal characteristics, specifically their educational experiences. Gould, Damarjian et

al. noted that coaches acquire invaluable information on mental training from both formal

and informal sport psychology education, as well as from personal reflection and

coaching experience. Consistent with previous literature concerning athletes (Anderson et al., 2004), coaches' gender has also been found to influence their attitudes towards the use of sport psychology services as a part of their training programs (Zakrajsek & Zizzi, 2007). Compared to the sample of male coaches, Zakrajsek and Zizzi (2007) found that female coaches had fewer stigmas towards sport psychology consultation and were more in favour of working with a certified practitioner.

Vealey (2007) and Gould, Damarjian et al.'s (1999) frameworks also emphasize the impact of coaches' personal characteristics on the effectiveness of their subsequent PST behaviours. Coaches' education, highlighted in component A of Gould, Damarjian et al.'s framework, is said to have influence on coaches' mental skills training actions (component E). Also, solid interpersonal and technical skills in PST providers have been shown to facilitate PST with athletes (Vealey, 2007; Gould, Damarjian et al.). Specifically, listening skills, being able to relate, and being open, flexible, and trustworthy were listed by coaches and athletes as critical interpersonal skills for successful consultants (Dunn & Holt, 2003; Gould et al., 1991; Orlick & Partington, 1987; Partington & Orlick, 1987). Additional support was provided by Lloyd and Trudel (1999) who performed a case study examining the verbal interactions between an eminent mental training consultant and five elite level athletes. The results of their study confirmed that listening and facilitating were invaluable interpersonal skills that increased the overall effectiveness of the mental training consultant. Competent PST providers have also been found to develop and implement effective PST programs that consist of relevant strategies and the use of appropriate techniques (Orlick & Partington, 1987; Partington & Orlick, 1987; Tod & Andersen, 2005).

As in Horn's (2008) model, the PST process highlighted in Vealey (2007) and Gould, Damarjian et al. (1999) frameworks emphasize the direct link between the values and beliefs of coaches and their PST behaviours. Simply put, coaches who are not receptive to PST, and do not value its importance within the training context, will not use it (Gould, Damarjian et al, 1999; Zakrajsek & Zizzi, 2007). Alternatively, the opposite is true. Vealey's (2007) framework proposes that the PST process is a multilayer construct that is established primarily based on the philosophy of the PST provider. Among PST providers, common philosophical differences have focused on the theoretical approaches and objectives of mental training. Vealey (2007) noted that these differences of values and beliefs will impact the effectiveness of PST providers, ultimately by influencing their consequent training behaviours.

2.1.2.5. Athlete-related variables. A second theoretical consistency between the two PST frameworks and Horn's (2008) model relates to the impact of athlete-related variables on the PST process, specifically on coaches' PST behaviours. Both Vealey (2007) and Gould, Damarjian et al.'s (1999) frameworks highlight the importance of athletes' personal characteristics on the behaviours (i.e., strategies and techniques) employed by PST providers. Also in line with Horn's (2008) model, Vealey (2007) and Gould, Damarjian et al. acknowledged the fact that the relationship between boxes 7 and 5 within the PST context is indirect, mediated by the internal processes of the PST provider.

The role of athletes' personal characteristics are highlighted twice within Gould, Damarjian et al.'s (1999) interactive framework for coaching mental skills in tennis. Within component B of the framework, the authors propose that the PST provider must

take the athletes' mental skill needs into consideration in order to properly develop and implement an effective PST program. These needs will differ among athletes depending on a variety of factors, including the athletic requirements of the sport (Rogerson & Hrycaiko, 2002), the context in which the athlete is competing, and finally the personal characteristics of the athlete (Gould, Damarjian et al.). Athletes' personal characteristics are also referred to in component C, indicating a link to the mental skills training climate (Gould, Damarjian et al.). Coaches have acknowledged that their PST behaviours will vary according to the gender, skills, socioeconomic status, and culture of the athletes (Gould, Damarjian et al.; Gould, Medbery et al. 1999).

Gould and colleagues' examination of PST opinions, beliefs, and practices of junior tennis coaches also revealed that athletes' skill level was a primary factor influencing coaches' use of PST (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999). Coaches indicated that as the competitive level of their athletes increased, they would be required to modify their delivery and frequency of PST, citing "the higher level you go, the more mental comes into play" (Gould, Damarjian et al.).

2.1.2.6. Outcomes of coaches' use of PST. A basic assumption of mental skills training is that the role of the provider is to facilitate the acquisition and development of mental skills among athletes (Gould, Damarjian et al., 1999; Vealey, 2007). In the past, mental skills were predominantly viewed as a means to improve athletic performance (Vealey, 1988). However, Vealey (2007) suggested that a primary purpose of mental skills is also to improve the personal well-being of sport participants. Much of the research on PST has focused on providing support for the link established between

coaches' PST behaviours and athletes' performance and behaviours as per Horn's (2008)

model of coaching effectiveness (Patrick & Hrycaiko, 1998; Swain & Jones, 1995).

In 1993, Savoy performed a case study on a 19-year-old female Division I

basketball player. During the off-season, the individual completed an individualized PST

program with the assistance of a certified practitioner. The results of the PST program

showed a decrease in the athlete's pre-game anxiety, and an improvement in game

performance statistics and overall practice performance. Similar results were established

with a group of recreational male triathletes (Thelwell & Greenlees, 2001, 2003). In line

with Savoy (1993), Thelwell and Greenlees' PST programs consisted of the four basic

mental skills – goal-setting, imagery, relaxation, and self-talk. Results of their study

indicated an overall increase in the triathlon performance of the participants. The positive

influence of PST on athletes' performance and behaviours has been supported within a

number of other sports, including basketball (Lobmeyer & Wasserman, 1986; Wrisberg

& Anshel, 1989), bowling (Paiva, 2007), cricket (Thelwell & Maynard, 2003), golf

(Beauchamp et al., 1996), soccer (Thelwell, Greenlees, & Weston, 2006), swimming

(Bar-Eli, Dreshman, Blumenstein & Weinstein, 2002), and tennis (Mamassis & Doganis,

2004).

In summary, the PST frameworks effectively highlight the commonalities

between the PST process and coaching effectiveness (Horn, 2008). In addition to sharing

a foundation of principle theoretical relationships with Horn's (2008) model, the PST

process can also be summarized by its complex, dynamic, and context-dependent nature.

There is no optimal PST program or process that will suit the demands of all sport

situations, but rather similar to Horn's (2008) model the effective use of PST will vary as

a function of both contextual factors and individual difference variables (Gould,

Damarjian et al.). However, even though both PST frameworks share many theoretical

similarities to Horn's (2008) model, it is important to note they fall short of providing

direct theoretical support for athlete-related outcomes of PST behaviours. Compared to

Horn's (2008) model of coaching effectiveness, there are a number of gaps in the

literature that need to be explored before an accurate and comprehensive conceptual

portrait of PST can be presented.

2.2. Need for Research

As a result of their analysis on coaching science literature, Gilbert and Trudel

(2004b) provided a detailed overview of the trends found in coaching research between

1970 and 2001. Their review also served to highlight areas within the field that are

limited in research. A primary gap in the coaching literature deals with the examination

of coaches' behaviours. Although there is a breadth a research that focuses on the

behavioural analysis of coaches, very few are combined with other coaching aspects,

such as their internal processes (Gilbert & Trudel, 2004b). A study that focuses on

multiple areas allows for a more thorough interpretation and accurate depiction of the

coaching process (Lyle, 2002).

Bloom (2007) also encouraged the use of multifocal research, highlighting the

need for more coaching research that includes the additional insights of athletes.

Researchers must provide athletes with a voice in order to gain a better understanding of

the impact of specific coaching behaviours (Bloom, 2007). Within the PST literature, the

majority of research that has examined coaches' use of PST has focused on the

antecedents of their behaviour, and largely ignored the athlete-related outcomes. Most of

the studies that look at the influence of PST with athletes focus solely on athletic performance and behaviours as assessment measures. Horn (2008) indicated that there is a dearth of research pertaining to the consequences of various coaching styles and behaviours on athletes' self-perception, beliefs, attitudes, and level of motivation. Specifically, there is a need for research examining the influence of coaches' behaviours on athletes' level of self-efficacy, attributional beliefs, and perceptions of performance control (Chelladurai, 2007; Horn, 2008). Horn (2008) also suggested that research is needed to better understand the effects of coaches' behaviours on athletes' psychosocial growth and development, particularly by examining the links between boxes 5, 7 and 8 of her model.

Another gap in the literature relates to the PST provider. There are virtually no studies that have examined the impact of coaches as PST providers. The large majority of studies relating to the development and implementation of PST programs involve sport psychologists or certified practitioners (Beauchamp et al., 1996; Savoy, 1993). Although there have been studies that examine the opinions, and attitudes of coaches towards PST (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999), very few have examined the process, in terms of the effectiveness and consequences, of coaches as PST providers. Both the dynamics of the coach-athlete relationship and the delivery of PST content will likely be influenced by the role the coach takes on (Horn, 2008). Therefore, in order to provide coaches with effective psychological skill sets, it is essential to gain a better understanding of the PST process when coaches are the PST providers.

The present study seeks to examine the relationship between coaches expectancies, values, beliefs, and goals (box 4), coaches behaviours (box 5), athletes'

perceptions, interpretations, and evaluation of their coaches' behaviour (box 8), and

athletes' self-perceptions, beliefs, and attitudes (box 9) of the PST process within Horn's

(2008) model of coaching effectiveness. Specifically, this project analyzes three

theoretical links highlighted within Horn's (2008) model: 1) coaches' opinions of PST

(box 4) and their subsequent PST behaviours (box 5), 2) coaches' use of PST and their

athletes' perceptions, interpretation, and evaluation of them (box 8), and 3) coaches' use

of PST and their athletes' self-perceptions, beliefs, and attitudes (box 9) (see Figure 2.4).

Outside the parameters of Horn's (2008) model, the present study examines whether

coaches' PST behaviours (box 5) are directly linked to athletes' self-perceptions (box9)

(see Figure 2.4).

III. Chapter Three

3.1. Methodology

3.1.1. Participants

The initial sample of participants yielded 602 individuals – 167 coaches (107 males, 60 females) and 435 athletes (219 males, 216 females). However, due to the nature of analysis and purpose of the present study, only intact teams (i.e., one coach and a minimum of three athletes) were retained for the final analysis of the research questions. The final total included 528 sport participants – 115 coaches (74 males, 41 females) and 413 athletes (206 males, 207 females). Coaches ranged in age from 20 to 71 years ($M =$ 50.45 years, $SD = 10.78$), had experience coaching curling for 0 to 45 years ($M = 12.37$ years, $SD= 8.61$), and had coached their current team members for 0 to 11 years ($M =$ 2.84, $SD = 1.87$). Among the sample of 115 coaches, 111 were NCCP certified, and four possessed no coach certification of any kind. Level of certification for NCCP certified coaches ranged from 1 to 4 ($M = 2.06$, $SD = 0.75$).

In total, 115 teams composed of three to five athletes were recruited for the study (57 male, 53 female, 5 mixed). Similar to the sample of coaches, the athletes varied substantially with regards to their demographic information. Athletes ranged in age from 13 to 58 years ($M = 20.42$, $SD = 6.02$), had experience curling for 1 to 45 years ($M =$ 10.22, $SD = 4.64$), and had played with their current teammates for 1 to 11 years ($M =$ 2.33, $SD = 1.46$). There were 70 teams with a coach of the same sex (44 male, 26 female), 40 teams with a coach of the opposite sex (27 male coach-female athletes, 13 female coach-male athletes), and five teams with a mixed-gendered composition (3 male coaches, 2 female coaches).

3.1.2. Procedures

This study was performed in direct collaboration with the Canadian Curling Association (CCA). Specific research objectives were presented to the CCA, at which point verbal approval to conduct the study was provided by Gerry Peckham, Director of High Performance. The CCA not only provided this study with invaluable direction, it also facilitated data collection in its role as contact liaison between the principal investigator and the curling participants. Prior to commencing data collection, an ethics application was submitted and cleared by the Research Ethics Board (REB) at Brock University.

Self-administered questionnaires were the primary source of data. In total, there were two survey packages that were used to collect data – one for coaches and one for athletes. The survey packages consisted of an invitation letter (see Appendix A), consent form (see Appendix B and C), demographic questionnaire (see Appendix D and E), and a copy of two sport-related questionnaires. The coaches were asked to complete a revised version of Zakrajsek and Zizzi's (2007) Sport-Psychology Attitudes-Revised Coaches questionnaire (see Appendix F) and Mental Skills Questionnaire (Bull, Albinson, & Shambrook, 2002) (see Appendix G), and the athletes were asked to complete the Coaching Competence Scale (Myers, Feltz, Maier, Wolfe, & Reckase, 2006) (see Appendix H) and the Sport-Confidence Inventory (Vealey, 2005) (see Appendix I).

Both hard copy and electronic versions of the survey packages were available for participants. Three hundred and eighty hard copy packages (380 coach surveys, 1900 athlete surveys) were mailed to all Provincial / Territorial Curling Associations and, in turn, added to the registration packages at all 2008-2009 Bantam and Junior Provincial /

Territorial Playdowns across Canada. These also included packages sent to the 2008-2009 Ontario University Athletics (OUA) Curling Championships and Ontario Colleges Athletic Association (OCAA) Curling Championships. Addressed envelopes with return postage were provided in each package. In total, 42 hard copy survey packages were completed and returned. Among the 42 teams, the data of 14 teams was collected in person at the 2009 Northern Ontario hosted by the Elliot Lake Curling Club, in Elliot Lake, Ontario and the 2009 Ontario Junior Playdowns hosted by the Gananoque Curling Club, in Gananoque, Ontario.

Electronic versions of the survey packages (i.e., coaches' and athletes') were created using SurveyMonkey, an online tool for creating and managing web surveys. The electronic survey packages were identical to the hard copy versions that were mailed out, consisting of an invitation letter (see Appendix A), consent form (see Appendix B and C), demographic questionnaire (see Appendix D and E), and a copy of two sport-related questionnaires. A public notice for the study, including a hyperlink to the survey packages and graphic design, was added to CCA homepage courtesy of Glenn van Gulik, Director of Information Technology. Also, an electronic link was forwarded to all Provincial / Territorial Curling Associations, as well as numerous Canadian Interuniversity Sport (CIS) and Canadian Colleges Athletic Association (CCAA) curling programs. In total, 394 individuals completed an online survey package – 127 coaches and 267 athletes. From this sample, it was determined that there were 73 intact teams that could be used for data analysis. Among the 73 teams, the data of 20 teams was collected in person at the 2009 Northern Ontario Bantam Playdowns, hosted by the Idylwylde Golf and Country Club, in Sudbury, Ontario. A computer kiosk, which consisted of four

laptops, was set-up next to the scoring tables and available for all teams to complete the online surveys.

3.1.3. Instrumentation

In order to gain a complete understanding of the PST process within curling, four variables were measured – two coach-related variables, and two athlete-related variables. They included coaches' PST attitudes and behaviours, as well as athletes' interpretations of their coaches, and their sport-confidence. A pilot study was performed with a group of four curling coaches (2 males, 2 females) to increase the face validity and content validity of the two revised coaching measures. Two coaches were NCCP certified, while the other two had no formal coach education or certification. No changes to the instruments were required as a result of the pilot study.

3.1.3.1. Coaches' PST attitudes. A revised version of Zakrajsek and Zizzi's (2007) Sport-Psychology Attitudes-Revised Coaches questionnaire (SPA-RC) was used to measure coaches' PST attitudes (see Appendix F). The SPA-RC consists of 21 statements that represent a three factor solution of coaches' attitudes toward sport psychology consultation: stigma tolerance (expected negative consequences of seeking sport psychology consultation); confidence in sport psychology consultation (belief that sport psychology consultation and mental training is useful); and personal openness (the willingness of respondent to try sport psychology consultation and mental training) (Zakrajsek & Zizzi, 2007). The SPA-RC's internal consistency estimates (Chronbach's *a*) estimates were .84 (stigma tolerance), .80 (confidence), and .73 (personal openness), which indicate three internally reliable factors. Coaches were asked to rate their agreement with each statement on a Likert scale ranging from 1 (*Strongly Disagree*) to 7

(*Strongly Agree*). The original wording of seven items was maintained, while 14 items were modified to make them more relevant for assessing coaches' attitudes toward PST. For instance, "I think a sport psychology consultant would help my team perform better under pressure" was modified to "I think *psychological skills training* would help my team perform better under pressure. Sample items from each of the three factors include, "I would not want to use psychological skills training with my team because other coaches would harass me" (stigma tolerance), "psychological skills training could help my team fine-tune their performance (confidence in PST), and "there are certain problems that should not be discussed outside of one's immediate family" (personal openness).

3.1.3.2. Coaches' PST behaviours. A revised version of Bull, Albinson, and Shambrook's (2002) Mental Skills Questionnaire was used to assess coaches' use of PST (see Appendix G). According to Bull and colleagues (2002), there are seven important aspects of the mental side of sport performance, including imagery ability, mental preparation, self-confidence, anxiety and worry management, concentration ability, relaxation ability, and motivation. Coaches were asked to rate how often they practice the preceding seven mental skills using a 7-point Likert-scale ranging from 1 (*Very Infrequently*) to 7 (*Very Frequently*). These seven mental skills are closely in line with factors established in other psychometrically validated instruments that have assessed psychological skills in athletes (Psychological Performance Inventory, Loehr, 1986; Psychological Skills Inventory for Sport, Mahoney et al., 1987; Test of Performance Strategies, Thomas, Murphy, & Hardy, 1999). Although the current study is concerned

with coaches' use of PST, term "mental skills training" was used in this questionnaire to match the previous instrument, and to avoid confusion with the sample of coaches.

   3.1.3.3. Athletes' interpretations of coaches. The Coaching Competence Scale (CCS) (Myers et al., 2006) was used to measure athletes' interpretations of their coaches (see Appendix H). Specifically, this instrument measures athletes' evaluation of their coaches' ability to affect their learning and performance. The CCS consists of 24 items including the stem: "How competent is your head coach in his or her ability to...". Each item is answered using a revised 7-point Likert scale, with categories ranging from 1 (*Not At All Competent*) to 7 (*Extremely Competent*). The original instrument used a 10-point scale; however, based on the recommendations of Myers and colleagues (p.118), "collapsing data may be necessary to achieve optimal categorization". The CCS measures four dimensions of coaching competence – motivation competence, game strategy competence, technique competence, and character building competence. Motivation competence (MC) refers to athletes' evaluation of their coaches' ability to affect both their internal and overt psychological processes (e.g., "help athletes maintain confidence in themselves"), game strategy competence (GSC) as athletes' evaluation of their coaches' leadership skills during competition (e.g., "recognize opposing team's weakness during competition"), technique competence (TC) as athletes' evaluation of their coaches' "instructional and diagnostic abilities" (e.g., "develop athletes' abilities"), and character building competence (CBC) as athletes' evaluation of their coaches' "ability to influence the personal development and positive attitude toward sport in their athletes" (e.g., "promote good sportsmanship") (Myers et al., p. 113). Finally, a unidimensional factor of coaching competence, total coaching competence (TCC), was defined as

"athletes' evaluation of their coaches' ability to affect their learning and performance" (Myers et al., p. 113).

The development of the Coaching Efficacy Scale (CES) (Feltz et al., 1999) was the basis for the initial stages of validation for the CCS. A sample of 590 college athletes completed the questionnaire. A multilevel confirmatory factor analysis was used to address the multilevel structure of the data. Interclass correlation coefficients values for the 24 items ranged from .22 to .42. Cronbach's alpha (α) estimates for the four dimensions of the CCS were .90 (MC), .87 (GSC), .85 (TC), and .82 (CBC), all suggesting very good to excellent internal consistency.

3.1.3.4. Athletes' sport-confidence. Vealey's (2005) Sport-Confidence Inventory (SCI) was used to measure the self-confidence of the athletes (see Appendix I). The SCI specifically assess athletes' confidence in their athletic abilities. This instrument consists of 14 items including the stem: "How certain are you that...". Each item is measured on a continuum ranging from 1 (*Can't Do It At All – Absolutely Not At All*) to 7 (*Totally Certain – Absolutely Sure I Can Without A Doubt*), where a score of 4 signifies, "maybe I can". The SCI measures three dimensions of sport confidence – physical skills and training, cognitive efficiency, and resilience. The physical skills and training dimension of sport confidence measures athletes' belief in their ability to successfully manage and execute the physical requirements of their sport (e.g., "you can execute the physical skills necessary to succeed") (Vealey, 2005). Vealey (2005) further described the cognitive efficiency dimension as the confidence athletes have in their ability to maintain focus and high levels of cognitive functioning that are required to perform successfully (e.g., "you can keep mentally focused throughout your competitive event"). Finally, she explained

that the resilience dimension refers to the confidence athletes have in their ability to

overcome performance adversity and bounce back with a successful performance (e.g.,

"you can regain your focus after a performance error").

3.1.4. Treatment of the Data

Once data collection was complete, all data was coded and inputted into the

computer software program SPSS (Statistical Package for the Social Sciences) version

16, for analysis. To ensure a high level of data accuracy, complete visual checks as well

as random spot checks were performed. A preliminary overview of the data was

examined using SPSS FREQUENCIES. This provided an opportunity to highlight any

emerging trends and identify any errors that were missed during the visual checks. At that

point all the values were within range, and all means and standard deviations were found

to be plausible (Tabachnick & Fidell, 2007).

3.1.4.1. Analyses of research questions. In order to address the specific research

questions outlined in the first chapter, two forms of multiple regression analysis were

used – standard multiple regression and hierarchical multiple regression. Standard

multiple regression is a technique that assesses the degree to which one continuous

dependent variable is related to a set of continuous independent variables (Tabachnick &

Fidell, 2007). It allows the researcher to assess the degree of which each independent

variable contributes towards the prediction of the specific dependent variable. Similar to

standard multiple regression, hierarchical regression computes the degree of relationship

between a dependent variable and a group of independent variables. However,

hierarchical regression allows the researcher the opportunity to give priority to the

independent variables prior to assessing their degree of contribution toward predicting the

dependent variable (Tabachnick & Fidell, 2007). In short, the effects of independent variables are assessed and statistically removed in order based on the priority allocated by the researcher (Tabachnick & Fidell, 2007).

Below is the list of specific research objectives outlined in chapter 1, including a brief description of the projected methods of data analysis.

1. Determine if coaches' PST behaviours can be significantly predicted by their opinions/attitudes of PST.

Standard multiple regressions were used to assess the degree to which coaches' attitudes/opinions of PST contribute to the prediction of their PST behaviours. The dependent variables for this analysis consisted of MSQ items, and the independent variables were the SPA-RC factors. Therefore, it was anticipated that a total of seven standard multiple regressions would be performed, one for each dependent variable (i.e., mental skills).

2. Determine if athletes' interpretation of their coaches' competencies can be significantly predicted by their coaches' PST behaviours.

A series of standard multiple regressions were to be used to assess the degree to which coaches' PST behaviours contribute to the prediction of athletes' interpretations of their coaches' competencies. It was anticipated that the dependent variables would consist of the four CCS factors, and the independent variables would be the MSQ items. In total four standard multiple regressions, one for each dependent variable (i.e., four dimensions of the CCS), were expected to be performed to answer the second research question.

3. *a) Determine if athletes' self-confidence can be significantly predicted by their*

interpretations of their coaches' competencies;

b) After accounting for the influence of athletes' interpretations of their coaches'

competencies, determine if athletes' self-confidence can be significantly predicted by

their coaches' use of PST.

A hierarchical multiple regression was proposed to be used to first assess the

degree to which athletes' interpretations of their coaches' competencies contributed to the

prediction of their self-confidence. This method of analysis would also serve to indicate

the contribution of coaches' PST behaviours to the prediction of athletes' self-confidence

after the effects of the initial group of independent variable (i.e., CCS factors) were

statistically removed. The dependent variables were to consist of the SCI factors, and the

independent variables being the CCS factors, and MSQ items. In total 11 multiple

regressions were anticipated to be performed in order to evaluate the final research

questions.

In summary, the purpose of this study was to examine the current PST situation in

curling across Canada. In collaboration with the CCA, 115 curling teams (including 115

coaches and 413 athletes) were questioned on several topics including their

attitudes/opinions of PST, their use of PST, their interpretations of their coaches, and

their self-confidence. The questionnaires employed to assess the aforementioned

variables included a revised version of both Zakrajsek and Zizzi's (2007) Sport-

Psychology Attitudes-Revised Coaches questionnaire and Bull, Albinson, and

Shambrook's (2002) Mental Skills Questionnaire, the Coaching Competence Scale

(Myers et al., 2006), and the Sport-Confidence Inventory (Vealey, 2005). Finally, the

data collected from the questionnaires were inputted into SPSS and analyzed using a

series of standard and hierarchical multiple regressions.

IV. Chapter Four

4.1. Data Analysis

4.1.1. Aggregation of Data

Initially, each athlete completed a copy of the survey package individually. Prior to data analysis, the means for each team were calculated. Intraclass correlation coefficients (ICC) (Kenny & La Voie, 1985) were calculated to ensure intra-team consistency, using the most common equation (Bartko, 1966, 1976; Hays, 1973; Myers, DiCecco, Lorch, 1981): $ICC = (MS_B - MS_W) / [MS_B + MS_W (N - 1)]$, where MS_B and MS_W are the mean square between and within groups, and N is the number of persons in each group (i.e., athletes). All ICCs were positive, ranging from $r = .39$ (Physical-Sport Confidence) to $r = .56$ (Motivation Competence), and significant at the $p < .01$ level (see Table 4.1). According to Kenny and La Voie (1985), a positive intraclass correlation coefficient indicates that group members are more similar than non-group members. Based on the ICC values obtained in the present study, there is sufficient justification for the aggregation of data, and subsequent analyses performed at the team level (Kenny & La Voie, 1985).

4.1.2. Descriptive Statistics

At the individual level, there were 50 missing data points. Due to the scarce quantity and concentration of the missing data, mean values of nearest cases were used for estimation (Tabachnick & Fidell, 2007). Once data was aggregated and team scores were created, there was no missing data. Univariate normality was assessed by verifying the skewness and kurtosis values for each factor. All factors were normally distributed with skewness values ranging from -.93 to 1.46, and kurtosis values ranging from -.98 to

1.87. These values fell within the recommended guidelines for acceptable normality

proposed by Tabachnick and Fidell (2007). Table 4.2 gives the means, standard

deviations, skewness and kurtosis for each of the SPA-RC factors, MSQ items, CCS

factors, and SCI factors. Multicollinearity was checked by analyzing a correlation matrix

between all factors of the four scales. Highly significant correlations were found within

CCS factors and SCI factors. This will be addressed further in the chapter. Among scales,

no mutlicollinearity was found between factors with correlations coefficients ranging

from $r = -.01$ to $r = .51$. Finally, multivariate normality was tested using Mahalanobis

distance. There were no significant outliers at the $p < .001$ level.

4.1.3. Measurement Analysis

4.1.3.1. Coaches' PST attitudes. Internal reliability of the three factor subscales

was established with Cronbach's (1951) alpha values of $\alpha = .83$ (Stigma Tolerance), $\alpha =$

.89 (Confidence in PST), and $\alpha = .71$ (Personal Openness) which are all greater than

Nunally's (1970) criteria of .70. Coaches' scores ranged from 1 to 4.29 ($M = 1.52$, $SD =$

.71) for Stigma Tolerance, 3.63 to 7 ($M = 5.96$, $SD = .93$) for Confidence in PST, and 1 to

5.67 ($M = 3.21$, $SD = 1.10$) for Personal Openness. There were no correlations suggesting

multicollinearity (i.e., $r > .90$; Tabachnick & Fidell, 2001).

4.1.3.2. Coaches' PST behaviours. Although multicollinearity was not established

between the seven variables in the MSQ, highly significant correlations were found

ranging from $r = .43$ to $r = .75$ (see Table 4.3). Based on Cohen's (1990)

recommendations for a parsimonious design, few independent variables and even fewer

dependent variables should be studied. In effect, according to Cohen (1990), this

decreases the probability of committing a Type I error, such as discovering something

that does not exist. Therefore, a global measure of PST Behaviour was calculated by combining the means of the seven variables (i.e., mental skills). Internal reliability for the new one factor model was established with a Cronbach's alpha value of $\alpha = .91$. Coaches' scores ranged from 1 to 7 ($M = 4.70$, $SD = 1.30$) for PST Behaviour. When a large variety of psychological skills have been measured in PST research (e.g., Frey, Laguna, & Ravizza, 2003), it is not uncommon to collapse all the psychological skills into a single psychological-skill score (Thelwell et al., 2008).

4.1.3.3. Athletes' interpretations of coaches. Internal reliability of the four CCS subscales was established with Cronbach's alpha values of $\alpha = .96$ (Motivation Competence), $\alpha = .92$ (Game Strategy Competence), $\alpha = .91$ (Teaching Competence), and $\alpha = .88$ (Character Building Competence). Multicollinearity was found between the four subscales with highly significant correlations ranging from $r = .79$ to $r = .91$ (see Table 4.4). Therefore, in line with previous research (Myers, Wolfe, & Feltz, 2005; Short et al., 2005) and the recommendations of Tabachnick and Fidell (2007), the four subscales were aggregated into a general coaching competence (GCC) factor. A Cronbach's alpha value of $\alpha = .95$ was also found in support for the one-factor model of coaching competence. Athletes' scores ranged from 3.96 to 7 ($M = 6.06$, $SD = .67$) for GCC.

4.1.3.4. Athletes' sport-confidence. Internal reliability of the three SCI subscales was established with Cronbach's alpha values of $\alpha = .89$ (Physical-Sport Confidence), $\alpha = .89$ (Cognitive-Sport Confidence), and $\alpha = .91$ (Resilience-Sport Confidence). Multicollinearity was found between the Cognitive-Sport Confidence and Resilience-Sport Confidence factors, with a highly significant correlation coefficient of $r = .93$. In line with the recommendations set forth by Tabachnick and Fidell (2007) for dealing with

multicollinearity, selecting the variable to delete should be based on logical, rather than statistical grounds. Therefore, based on the specific research objectives and definitions established for the two sport-confidence subscales, Cognitive-Sport Confidence was retained and Resilience-Sport Confidence was eliminated from subsequent analyses. Athletes' scores ranged from 3.73 to 6.93 ($M = 5.92$, $SD = .60$) for Physical-Sport, and from 3.20 to 7 ($M = 5.57$, $SD = .76$) for Cognitive-Sport Confidence.

4.1.4. Regression Analyses

Research questions were analyzed using a series of multiple regressions. Three of the four regressions models were significant. Table 4.5 summarizes the significant predictors for each model. In order to determine whether or not coaches' PST behaviours could be significantly predicted by their PST attitudes, it was anticipated that seven standard multiple regressions were needed. With the seven PST behaviours being aggregated into a global PST behaviour measure, a single standard multiple regression was performed. The model for coaches' PST behaviours was not significant, $F (3, 111) = 1.31$, $p > .05$. Coaches' PST attitudes (i.e., SPA-RC factors) was not a significant predictor.

It was originally proposed that four standard multiple regressions would be needed to determine if athletes' interpretations of their coaches' competencies could be significantly predicted by their coaches' PST behaviours due to the number of CCS subscales. However, due to multicollinearity between CCS subscales, a single standard multiple regression was performed with GCC as the dependent variable. The model for athletes' interpretations of their coaches (i.e., GCC) accounted for 16.1% of the variation,

F (1, 113) = 21.74, p < .01., with coaches' PST behaviours being the only significant predictor.

Finally, in order to examine the third research question, it was anticipated that 11 multiple regressions were going to be needed. With the creation of the global PST behaviour measure and GCC measure due to multicollinearity among subscales, only two hierarchical multiple regressions were required. The aforementioned measures were treated as the independent variables and the SCI subscales were the dependent variables. The model for athletes' Physical-Sport Confidence accounted for 15.0% of the variation, F (1, 113) = 15.38, p < .01.GCC and coaches' PST behaviours were both significant predictors of the model. After statistically controlling the influence of GCC, the model accounted for 3.0% of the variation, F (1, 112) = 4.01, p < .05. The model for athletes' Cognitive-Sport Confidence accounted for 35.7% of the variation, F (1, 113) = 25.96, p < .01. GCC and coaches' PST behaviours were both significant predictors of the model. After statistically controlling the influence of GCC, the model accounted for 17% of the variation, F (1, 112) = 29.56, p < .01.

V. Chapter Five

5.1. Summary of Results

5.1.1. Research Question #1

The first research question sought to determine whether or not coaches' PST behaviours could be significantly predicted by their attitudes of PST. According to the results of the standard multiple regression analysis, coaches PST behaviours could not be significantly predicted solely based on their PST beliefs. Although this finding is consistent with previous PST literature (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999), it goes against the theoretical (Bandura, 1997; Feltz et al., 1999) and empirical (Howson, 1996; Rockwell, Nickols-Richardson, & Thye, 2001) support for the attitude-behaviour link within the coaching process.

Within the PST literature, Grobbelaar (2007) examined the implementation of mental skills training programs by South African netball coaches. The results of his study provided glaring similarities to those of the present study regarding the link between coaches' attitudes and behaviours. More specifically, although the vast majority (89.90%) of South African coaches surveyed regarded mental skills training as a very important aspect of netball, less than half (46.43%) implemented mental training programs with their athletes, or made use of sport psychologists (Grobbelaar, 2007). Coaches reported a lack of knowledge concerning mental skills training, financial limitations, and the unavailability of sport psychologists as the most prolific reasons for not implementing these coaching methods as a part of their athletic training (Grobbelaar, 2007).

Outside the parameters of PST research, several studies have supported a positive link between the beliefs, attitudes and opinions of coaches and their behaviour, both

theoretically (Feltz et al., 1999; Horn, 2008) and empirically (Howson, 1996; Paquette, Sullivan, Holt, Bloom, & Rootes, 2008; Short, Smiley, & Ross-Stewart, 2005; Rockwell, Nickols-Richardson, & Thye, 2001; Sullivan & Kent, 2003). Research has found coaches' beliefs (i.e., efficacy) to be related to their leadership behaviours (Feltz et al.; Paquette et al., 2008; Sullivan & Kent, 2003) and self-regulatory cognitive strategies (Short, Smiley, & Ross-Stewart, 2005). Coaches' attitudes and opinions about athletes' use of drugs (Howson, 1996), and proper nutrition (Rockwell, Nickols-Richardson, & Thye, 2001) have also been found to have a direct impact on their subsequent coaching behaviours. Specifically, coaches who possessed strong beliefs concerning drug usage (Howson, 1996) and proper nutrition (Rockwell, Nickols-Richardson, & Thye, 2001), demonstrated more preventive behaviours to ensure their opinions were effectively transmitted to their athletes.

The disconnect between coaches' PST beliefs and behaviours is an important trend that is unique to the coaching literature. There is reason to believe that PST, as it relates to coaches, differs from other avenues of the coaching process, such as coaching efficacy (Feltz et al., 1999) athlete nutrition (Rockwell, Nickols-Richardson, & Thye, 2001) and drug use (Howson, 1996). There have been some suggestions made as to why a disconnect in the attitude-behaviour relationship seems to continually reappear strictly within the PST literature. Gould, Damarjian et al. (1999) proposed that coaches' PST behaviours are influenced by a collection of factors, including coaching experience and education, the mental skill needs of the athlete(s), and the mental training climate (i.e., player attributes, coach-athlete relationship). Coaches' knowledge of PST (i.e., content and procedural knowledge) was also suggested to be a primary determinant for why

coaches often fail to implement PST strategies with their athletes. This has been supported by Gould and colleagues (Gould, Damarjian et al., 1999; Gould & Eklund, 1991; Gould, Medbery et al., 1999) and Ottley (2000).

5.1.2. Research Question #2

The second research objective questioned whether or not athletes' interpretation of their coaches' competencies could be significantly predicted by their coaches' PST behaviours. The results were positive for this relationship, suggesting that coaches' use of PST behaviours significantly predicted their athletes' interpretations of their competencies. This relationship has been examined extensively within both the leadership literature (Gumming, Smith, & Smoll, 2006; Kent & Chelladurai, 2001; Smith & Smoll, 1989) and coach-athlete compatibility literature (Jowett & Lavallee, 2007; Jowett & Poczwardowski, 2007; Kenow & Williams, 1999).

Empirical support for this link has been established across several coaching avenues, including athletes' satisfaction with their coaches (Baker, Yardley, & Côté, 2003; Martin, Rocca, Cayanus, & Weber, 2009), and athletes' interpretations of their coaches' attitudes regarding aggression in sport (VaezMousavi & Shojaei, 2005). Baker, Yardley, and Côté (2003) examined the predictive nature of a series of seven coaching behaviours, including mental preparation, for coaching satisfaction. The results of their study indicated that all seven coaching behaviours were main effect predictors for coaching satisfaction. Similarly, Martin, Rocca, Cayanus, and Weber's (2009) investigated the relationship between coaches' behaviours, specifically with regards to their use of Behaviour Alteration Techniques (BATs), and athletes' motivation and affect for their coaches. Similar to the results of the present study, and those established by

Baker and colleagues (2003), Martin and colleagues (2009) found that coaches'

behaviours were directly related to their athletes' evaluation of their likability.

VaezMousavi and Shojaei (2005) examined the association between coaches'

behaviours and players' aggressive and assertive actions among a sample of 115 national

high school championship teams. The authors found that coaches' positive feedback or

lack of feedback influenced athletes' perceptions of their coaches' attitudes towards

aggression in sports. Specifically, coaches that provided positive feedback were

perceived as being supportive of aggression in sports, whereas coaches that gave no

feedback were perceived by their athletes as being tolerant of aggression in sports

(VaezMousavi & Shojaei, 2005). In both cases, coaches' behaviours were found to affect

their athletes' perception of them.

5.1.3. Research Question #3

The final research question was twofold. The first objective was to determine if

athletes' self-confidence could be significantly predicted by their interpretations of their

coaches' competencies. Secondly, after accounting for the influence of athletes'

interpretations of their coaches' competencies, determines if athletes' self-confidence

could be significantly predicted by their coaches' use of PST. In both cases significant

predictive relationships were found between variables. Not only were coaches PST

behaviours able to significantly predict athlete self-confidence, so were athletes'

interpretations of their coaches upon statistically controlling for coaches' behaviours.

In support of the previous findings, Price and Weiss (2000) examined the

relationship among coach burnout, coach behaviours, and athletes' psychological

responses of a sample of 193 female high school soccer players and 15 head coaches.

Their results indicated that athlete perceptions of their coaches' behaviours, such as greater training and instruction, social support, positive feedback, democratic decisions, and less autocratic style, were related to an increase in positive psychological outcomes, including perceived competence. Similarly, Kenow and Williams' (1999) investigation of coach-athlete compatibility and athletes' perception of coaching behaviours revealed that athletes' self-confidence was significantly related to their evaluation of their coaches' behaviours. These results supported those found by Kenow and Williams (1992) while investigating the relationship between anxiety, self-confidence, and athlete evaluation of coaching behaviours.

The link between coaches' behaviours and athletes' self-confidence is conceptually supported by Bandura (1997). Bandura (1997) proposed that self-efficacy beliefs are formed according to a select group of sources, including past performance accomplishments, vicarious experiences, verbal persuasion, and physiological states. Based on this proposition, coaches' behaviours could directly influence athletes' self-efficacy in two ways. Firstly, athletes could gain efficacy through the modeling and social comparison of the performances of their coach (i.e., vicarious experiences). Also, coaches could influence the efficacy beliefs of their athletes by using verbal persuasion, such as evaluative feedback, inspirational messages, and self-talk (Feltz et al., 2007).

Empirical support for this relationship was provided by Vargas-Tonsing's (2009) exploratory examination of the effects of coaches' pre-game speeches on athletes' perceptions of self-efficacy and emotion. The study examined 151 competitive soccer players and 10 male coaches. The results of the investigation indicated that coaches' behaviours (i.e., speeches) have the potential to influence the self-confidence of their

athletes. Similar findings were established by Vargas-Tonsing, Myers, and Feltz (2004) as a result of their study on coaches' and athletes' perceptions of efficacy-enhancing techniques.

5.2. Theoretical Contextualization

The results of this study provided partial support for Horn's (2008) model of coaching effectiveness. The focus of the present study narrowed in on the relationship between four components of her model. These components consisted of coaches' expectancies, values, beliefs, and goals (box 4), coaches' behaviours (box 5), athletes' perceptions, interpretations, and evaluation of their coach (box 8), and athletes' self-perceptions, beliefs, and attitudes (box 9) (see Figure 2.1). Horn's (2008) model proposes a series of direct links between these four components, suggesting that coaches' beliefs will have a direct influence on their behaviour, coaches' behaviour will directly affect the evaluation that is given to them by their athletes, athletes' perceptions of their coach will have a direct impact on their self-perceptions, and coaches' behaviour will indirectly influence their athletes' self-perceptions.

Within the PST context, only two of the four links were supported. Coaches' use of PST behaviours was found to significantly predict their athletes' interpretations of their overall coaching competencies. In short, athletes, with coaches who implemented PST behaviours more frequently into their coaching methods, perceived their coaches to be more competent. Also in line with Horn's (2008) model, athletes' interpretations of their coaches' competencies were found to significantly predict their self-confidence. This suggests that athletes who perceived their coaches to be more competent had greater self-confidence in their ability to be successful in their sport, and vice versa.

Conversely, coaches' attitudes towards PST were not found to significantly predict the frequency in which they used PST behaviours when coaching their athletes. This finding is somewhat surprising considering the vast research that has supported this link among both athletes (Bandura, 1977, 1997) and coaches (Feltz et al., 1999; Nicholls, 1984, 1992; Sullivan & Kent, 2003). Although this finding is contrary to one of the primary theoretical links established by Horn (2008), it is well supported within the PST literature (Gould, Damarjian et al., 1999; Gould, Medbery et al., 1999; Ottley, 2000; Thelwell et al., 2008). Moreover, the results of this study provided support for a direct relationship between coaches' behaviours (box 5) and athletes' self-perceptions, beliefs, and attitudes (box 9). According to Horn's (2008) model, these two components are related indirectly, mediated by athletes' perceptions, interpretations, and evaluation of their coach. However, within the findings of the present study, coaches' PST behaviours were found to significantly predict athletes' self-confidence. This suggests that athletes with greater self-confidence in their ability to succeed had coaches who used PST behaviours more frequently.

The results of the present study are also supportive of other models, including Gould et al.'s (1999) tentative framework for coaching mental skills in tennis, Chelladurai's (2001) multidimensional model of leadership (MML), and Jowett and Poczwardowski's (2007) conceptual model of the coach-athlete relationship, also comprise these relational elements. The MML (Chelladurai, 2001) is rooted in the belief that a leader's (i.e., coach's) influence relies on the interdependent relationship between the leader, the athlete, and the environment. Chelladurai's (2001) central hypothesis relates to the influence of leaders' behaviour on the perceptions of their athletes,

specifically their satisfaction (Riemer, 2007). Similarly, according to Jowett and Poczwardowski's (2007) conceptual model of the coach-athlete relationship, coaches' behaviours are linked to a collection of interpersonal outcomes, including athletes' satisfaction with the relationship. It can be argued that athletes' satisfaction with regards to their relationship with their coach can be classified as a result of their evaluation and perception of their coach, according to Horn's (2008) model of coaching effectiveness.

This relationship has also been alluded to within Gould, Damarjian et al.'s (1999) framework for coaching mental skills in tennis. The authors suggested that the frequency and type of mental skills training actions used by coaches would greatly depend on their relationship with their athletes. The quality of this relationship has been suggested to be a product of the perceptions of both parties (Jowett & Poczwardowski, 2007). Gould and colleagues further emphasized that the components of the framework do not work independently but rather interact in reciprocal ways, suggesting a bidirectional relationship between coaches' mental skills training behaviours and athlete perceptions of their coaches.

5.3. Implications for Curling

The following are implications specific to the sport of curling that can be extracted from this study based on its findings. Results indicated that both athlete-related outcomes (i.e., perceptions of their coach, and self-confidence) were significantly linked to their coaches' use of PST. It was also noted by curling coaches that their use of PST was moderate, and by no means a frequent occurrence during the athletic training process. As a result, it would only be logical to promote coaches' use of PST with their athletes. This can be accomplished in several ways. Perhaps the coaching certification

process should emphasize sport psychology to a greater extent, which would provide

coaches with the additional PST knowledge that has been previously reported to be a

primary obstacle for using PST (Gould, Damarjian et al., 1999). It would also be useful

for the CCA to provide coaches with additional opportunities to gain practical experience

with PST. One way of doing this would be to have certified practitioners or sport

psychology consultants facilitate open forums for curling coaches to attend. With all of

the benefits that have been associated with PST in sports, the CCA should be a leader

among national sport governing bodies to promote sport psychology as an essential part

of athletic training. In order for the CCA to accomplish this initiative, it must be prepared

to provide their coaches with the support (i.e., educational and financial) required to

overcome the roadblocks that have discouraged the attempts of others.

5.4. Limitations

5.4.1. Measures

Horn (2008) stated that there is no one instrument that can effectively measure the

collection of relationships found within the model of coaching effectiveness. As a result,

there a multitude of instruments that could assess the wide range of variables found

within each box of Horn's (2008) model. It is possible that the use of different

instruments may have presented different findings. Also, very few measures exist that

purport to evaluate the PST process as a viable method of athletic training. Unfortunately,

the PST literature focuses primarily on measures designed to assess athletes' and

coaches' perceptions of sport psychology as an institution within sport. Therefore, some

of the instruments employed in the present study had derived from previously existing

scales.

5.4.2. Biased Sample

In line with previous research examining coaches' use of PST (e.g., Gould, Medbery et al., 1999), this study may have been limited by a biased sample of participants. Due to voluntary nature of participation for this study, it is possible that only coaches with previous exposure to PST, or those with positive attitudes towards the use of PST elected to participate. This limitation may have contributed to the low return rate of survey packages, which in its own right weakens the sample's generalizability (Gould, Medbery et al.).

5.4.3. Single-Sport Sample

The generalizability of the findings of this study is limited by the use of a single-sport sample of participants. According to Horn's (2008) model of coaching effectiveness, the relationships within the coaching process are influenced by the characteristics of the sport in question. Therefore, it can be proposed that the current study's findings are a by-product of the sociocultural context and organizational climate of curling. As a result, it is possible or even likely that these findings can be applied to other sports that share similar organizational and sociocultural characteristics to those of curling (Horn, 2008).

5.4.4. Impact of Previous/Upcoming Match

Surveys were available in both hard copy and electronic version, and completed at the convenience of the coaches and athletes. As a result, it is likely that questionnaires were not completed at a similar time across the sample of participants. Subsequently, it is a distinct possibility that scores may have been influenced by previous or upcoming matches. There are many factors that may have influenced the participants' perception of

the questionnaire content (i.e., self-confidence, interpretation of their coaches' competencies) based on the timing of their participation, either immediately before or after a match. For example, it is possible that athletes who completed their questionnaires immediately following a victory may have responded more favourably in comparison to athletes who were handed a recent defeat. In a similar vein, athletes preparing for a match against a top-seeded team may have responded to the questionnaires with a pessimistic outlook due to their upcoming challenge.

5.4.5. Self-Report Questionnaires

Finally, as with all self-report questionnaires, the responses provided by the participants reflect their expressed opinions and not necessarily their actual attitudes, behaviours, and perceptions (Gould, Medbery et al., 1999). These tendencies can often be attributed to cognitive dissonance and social desirability. Cognitive dissonance creates a discrepancy between how participants think they behave and their actual behaviours (Gould, Damarjian et al., 1999), while social desirability influences how participants respond based on pressures to conform or appear socially desirable (Gould, Hodge, Peterson, & Petlitchkoff, 1987).

5.5. Future Directions

In addition to the practical applications listed above, there are several future directions that can be derived from this study. These include the addition of a behavioural assessment technique to better examine coaches' PST behaviours, a performance variable to link coaches' PST behaviours to athletic performance, and the use of qualitative inquiry to provide the additional insight of the sport participants. Each of these directions would provide this study with additional reliability and validity.

5.5.1. PST Behaviour Measure

As noted in the limitations of this study, self-report questionnaires are susceptible to a variety of cognitive misperceptions among participants. In order to avoid these shortcomings, future research should focus on the use of behavioural assessment techniques that allow coaches' use of PST to be directly observed and recorded by a third party. A revised PST version of the Coaching Behaviour Assessment System (CBAS) could provide researchers with a good starting point.

5.5.2. Performance Outcome

The PST literature is not short of studies supporting its positive influence on athletic performance. However, it would have been optimal to add a performance variable to conclude the series of relationships in line with Horn's (2008) model of coaching effectiveness. Future research could examine a variety of performance-related outcomes as a result of coaches' use of PST. These outcomes could include team winning percentage, won-loss record, or a more specific performance measure such as shooting percentage (i.e., curling).

5.5.3. Qualitative Approach

Due to the exploratory nature of this study, future research examining similar relationships could benefit from taking a qualitative approach in line with some of the more recent studies performed by Thelwell and colleagues (Thewell et al., 2008; Thelwell, Greenlees, & Weston, 2006).Qualitative inquiry would allow the additional insight of both the coaches and athletes to emerge, potentially shedding light on rich data, that would have normally not been uncovered (Kvale & Brinkmann, 2008).

Unfortunately, quantitative research is limited by its design and choice of instrumentation (Willis, 2007).

Future qualitative research should focus on providing the literature with a better understanding of factors that influence coaches' PST behaviours. Specifically, based on the findings of this study and those established by previous studies examining coaches' use of PST (Gould, Damarjian et al., 1999; Grobbelaar, 2007), how and why do these factors cause a disconnect between coaches' PST attitudes and behaviours? This type of research is needed in order to find solutions to minimize the debilitative effects of these variables. Finally, research examining the specific strategies used to implement PST behaviours is also an interesting avenue that has yet to be explored in any detail within the coaching literature. Thelwell and colleagues (2008) examined the specific skills coaches use, but there is still a need to better understand how these skills are employed by coaches, and why some coaches are more successful in implementing PST with their athletes compared to others.

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VII. Tables

Table 4.1.

Intra-class Correlation Coefficients for All Team Variables

Variable	ICC(r)	$F_{(114,298)}$
Motivation Competence	.56	5.50**
Game-Strategy Competence	.53	5.07**
Teaching Competence	.55	5.37**
Character Building Competence	.43	3.74**
Physical-Sport Confidence	.39	3.26**
Cognitive-Sport Confidence	.51	4.79**
Resilience-Sport Confidence	.53	4.99**

Note: ** $p < .01$.

Table 4.2.

Descriptive Values and Normal Distribution of All Variables

Variable	n	*M*	*SD*	Skew	Kurt
1. Stigma Tolerance	115	1.52	.71	1.46	1.87
2. Confidence in PST	115	5.96	.93	-.89	-.28
3. Personal Openness	115	3.21	1.10	.04	-.98
4. Imagery	115	3.58	1.77	.33	-.92
5. Mental Preparation	115	4.39	1.71	-.01	-1.18
6. Self-Confidence	115	5.51	1.43	-.83	.18
7. Anxiety Management	115	4.31	1.62	.02	-1.02
8. Concentration Ability	115	4.63	1.59	-.07	-.90
9. Relaxation Ability	115	4.27	1.57	.02	-.78
10. Motivation	115	5.41	1.36	-.93	.59
11. Motivation Competence	115	5.80	.85	-.87	.89
12. Game-Strategy Competence	115	6.05	.68	-.94	.74
13. Teaching Competence	115	6.05	.73	-1.20	1.45
14. Character Building Competence	115	6.32	.60	-1.25	1.44
15. Physical-Sport Confidence	115	5.92	.60	-.86	.98
16. Cognitive-Sport Confidence	115	5.57	.76	-.77	1.15
17. Resilience-Sport Confidence	115	5.43	.81	-.55	.85

Note: All variables were measured using a 7-point Likert scale ranging from 1 to 7. SPA-RC factors (i.e, items 1-3) with higher scores reflect coaches with more expected negative outcomes for using PST, more confidence in the usefulness of PST, and more open to try PST or sport psychology consultation. MSQ items (i.e., items 4-10) with higher scores reflect greater use of the PST strategy by coaches. CCS factors (i.e., items 11-14) with higher scores reflect athletes with a greater evaluation of their coaches' ability to motivate, leadership ability during competition, teaching ability, and ability to build character in athletes. Finally, SCI factors (i.e., items 15-17) with higher scores reflect athletes with more confidence in their physical ability, cognitive ability, and resilience.

Table 4.3.

Intercorrelations Between MSQ Items

Variable	1	2	3	4	5	6	7
1. Imagery	-	.75**	.48**	.61**	.65**	.56**	.43**
2. Mental Preparation		-	.66**	.58**	.67**	.70**	.54**
3. Self-Confidence			-	.53**	.61**	.59**	.71**
4. Anxiety Management				-	.74**	.66**	.47**
5. Concentration Ability					-	.65**	.53**
6. Relaxation Ability						-	.50**
7. Motivation							-

Note: n = 115, **p* < .01.

Table 4.4.

Intercorrelations Between CCS Factors

Variable	1	2	3	4
1. Motivation Competence	-	.83**	.79**	.83**
2. Game-Strategy Competence		-	.91**	.80**
3. Teaching Competence			-	.81**
4. Character Building Competence				-

Note: n = 115, **p < .01.

Table 4.5.

Summary of Regression Equations for Variables Predicting General Coaching Competence, Physical-Sport Confidence and Cognitive-Sport Confidence

DV	IV	B	β
GCC	PST Behaviours	.21	.42**
Physical-Sport Confidence	GCC	.31	.35**
	PST Behaviours	.04	.19*
Cognitive-Sport Confidence	GCC	.49	.43**
	PST Behaviours	.26	.45**

*Note: * $p < .05$. ** $p < .01$.*

GCC = General Coaching Competence

VIII. Figures

Figure 2.1. Horn's (2008) working model of coaching effectiveness
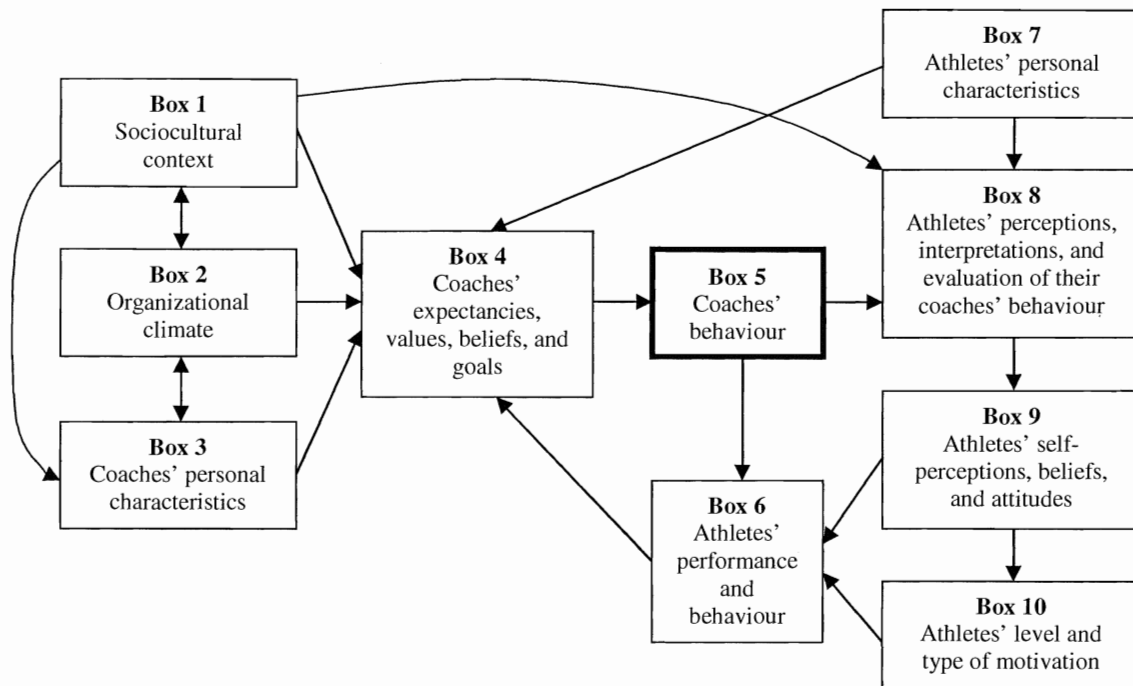
Figure 2.2. Vealey's (2007) framework for understanding mental skills training in sport
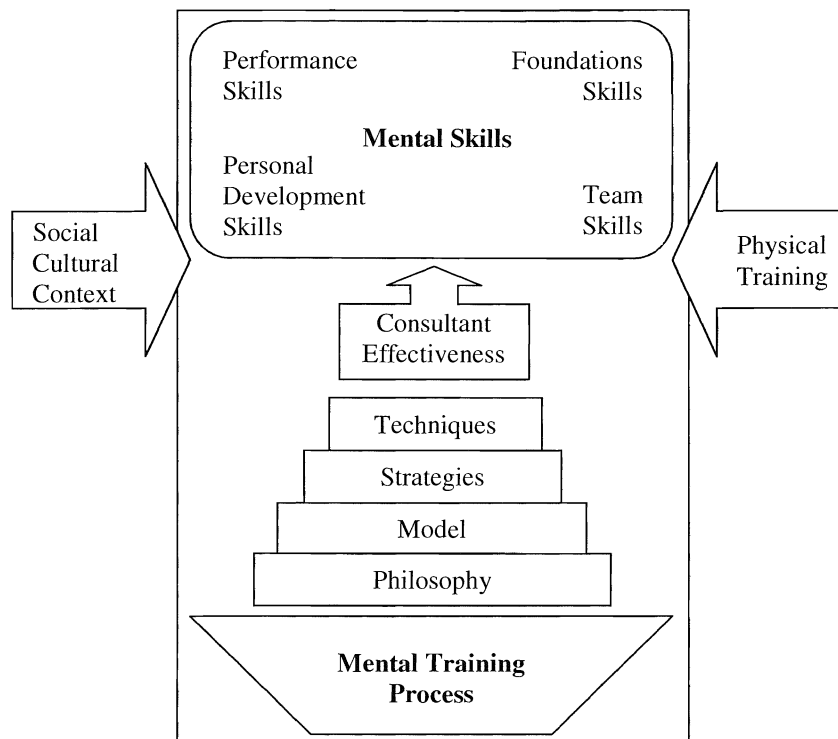
Figure 2.3. Gould, Damarjian, & Medbery's (1999) tentative interactive framework for coaching mental skills in tennis

A. General Coach Orientation Toward Mental Skills Training	B. Athlete Mental Skill Needs
• Formal education • Informal experience • Reflection	• Increase self-confidence • Arousal regulation • Improve sportsmanship

C. Mental Skills Training Climate

Player Attributes	*Coach-Athlete Relationship*	*Outside Factors/Obstacles*
• Gender • Skills • SES • Culture	• Awareness/ability to read athletes • Communication skills • Trust	• Parental views of mental skills • Time constraints

D. Coach Mental Skills Training Knowledge

• Content	• Process

E. Mental Skills Training Action

• Exercises	• Drills	• Activities	• Feedback

Figure 2.4. Research objectives within Horn's (2008) model
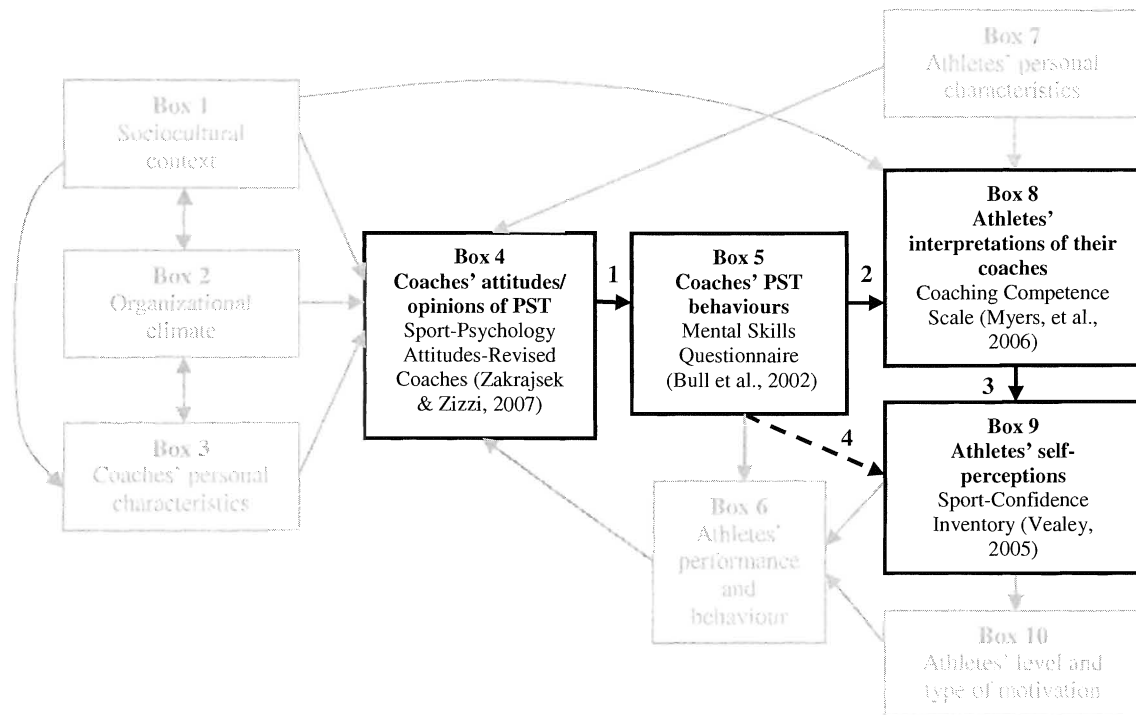
Appendix A

Invitation Letter

Title of Study: Coaches' Use of Psychological Skills Training in Canadian Curling

Principal Investigator: Kyle Paquette, MA Candidate in Applied Health Sciences, Department of Physical Education and Kinesiology, Brock University

I, Kyle Paquette, MA Candidate at Brock University, in collaboration with Gerry Peckham, Director of High Performance for the Canadian Curling Association, invite you and your team to participate in a research project entitled *Coaches' use of psychological skills training in Canadian curling.*

The purpose of this research project is to assess the attitudes and behaviours of a large sample of curling coaches, and to determine how they may impact their athletes. Specific outcomes include the coach's interpretation of their attitudes and practice of mental training, and the athlete's interpretation of their coach's impact on their sport performance and confidence via psychological skills training.

Attached is a copy of a survey package for you, the coach, and one for every athlete on your team. Participation is voluntary and all information is considered confidential. The expected duration of participation in this study would be about 15 minutes. By no means are you required to complete this at the event. Feel free to take it home with you and complete it at your team's convenience.

This research should benefit the Canadian Curling Association by being able to identify coaching behaviours that have optimal effects on young competitors, and by providing a foundation for possible future coach training programs.

If you choose to participate, an envelope with a return address and postage is provided inside the package. Please collect all completed surveys and consent forms and mail them to the address listed.

If you have any questions, please feel free to contact me at anytime. We look forward to your positive response.

Thank you,

Kyle Paquette
MA Candidate, Applied Health Sciences
Brock University
(905) 980-4374
kp07ih@brocku.ca

Gerry Peckham
Director, High Performance
Canadian Curling Association
(613) 834-2076 ext. 113
gpeckham@curling.ca

Appendix B

Consent Form – Athletes

Consent Form – Athletes

Project Title: Coaches' Use of Psychological Skills Training in Canadian Curling

Principal Student Investigator:	**Faculty Supervisor:**
Kyle Paquette	Philip Sullivan
MA Candidate, Applied Health Sciences	Associate Professor
Department of Physical Education and	Department of Physical Education
Kinesiology	and Kinesiology
Brock University	Brock University
(905) 980-4374	(905) 688-5550 extension 47874
kp07ih@brocku.ca	Phil.sullivan@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this study is to examine the effect of coaching behaviour on athlete-related outcomes.

WHAT'S INVOLVED
As a participant, you will be asked to complete 2 surveys. One is on your perceptions of your coach; the other is on your confidence within sport. Participation will take approximately 15 minutes of your time.

POTENTIAL RISKS
There are no known risks associated with participation in this study.

CONFIDENTIALITY
All information you provide is considered confidential. Although your team name will initially be associated with the data for input purposes, all identification will be deleted upon the completion of data collection. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Data collected during this study will be stored in a secure location on Brock University campus. Data will be kept for 3 years after which time the surveys will be shredded. Access to this data will be restricted to the principle investigator and his faculty supervisor.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

PUBLICATION OF RESULTS
Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available through the principle investigator – Kyle Paquette – at the phone number and email address given above. Feedback should be available within 6 months of your participation.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Investigator or the Faculty Supervisor using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (07-246). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project.

CONSENT FORM

Please check (√) one

☐ *If under the age of majority (18 years) Parental Consent is required*
I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name of child: _____

Signature of parent or legal guardian: _____   Date: _____

☐ *If 18 years or older*
I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____   Date: _____

Appendix C

Consent Form – Coaches

Consent Form – Coaches

Project Title: Coaches' Use of Psychological Skills Training in Canadian Curling

Principal Student Investigator:	**Faculty Supervisor:**
Kyle Paquette	Philip Sullivan
MA Candidate, Applied Health Sciences	Associate Professor
Department of Physical Education and Kinesiology	Department of Physical Education and Kinesiology
Brock University	Brock University
(905) 980-4374	(905) 688-5550 extension 47874
kp07ih@brocku.ca	Phil.sullivan@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this study is to examine the effect of coaching behaviour on athlete-related outcomes.

WHAT'S INVOLVED
As a participant, you will be asked to complete 2 surveys on your coaching attitudes and behaviours. Participation will take approximately 15 minutes of your time.

POTENTIAL BENEFITS AND RISKS
Possible benefits of participation include having a better appreciation of your own coaching behaviour. There are no known risks associated with participation in this study.

CONFIDENTIALITY
All information you provide is considered confidential. Although your team name will initially be associated with the data for input purposes, all identification will be deleted upon the completion of data collection. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Data collected during this study will be stored in a secure location on Brock University campus. Data will be kept for 3 years after which time the surveys will be shredded. Access to this data will be restricted to the principle investigator and his faculty supervisor.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

PUBLICATION OF RESULTS
Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available through the principle investigator – Kyle Paquette – at the phone number and email address given above. Feedback should be available within 6 months of your participation.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Investigator or the Faculty Supervisor using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (07-246). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____   Date: _____

Appendix D

Demographic Questionnaire – Athletes

Demographic Questionnaire

The following questions are demographic information important to this study. As with all questions on this survey, there is no penalty if you choose to not answer these questions.

1. How old are you? _____ years.

2. Are you male or female? (circle one)

3. How long have you curled? _____ year(s).

4. How long have you played with this team? _____ year(s).

Appendix E

Demographic Questionnaire – Coaches

Demographic Questionnaire

The following questions are demographic information important to this study. As with all questions on this survey, there is no penalty if you choose to not answer these questions.

1. How old are you? _____ years.

2. Are you male or female? (circle one)

3. Are you certified? Yes or No (circle one)

4. What is your highest level of certification? Level _____ of NCCP.

5. How long have you been a curling coach? _____ year(s).

6. How long have coached your current team? _____ year(s).

Appendix F

Sport-Psychology Attitudes-Revised Coaches Questionnaire

Sport-Psychology Attitudes-Revised Coaches Questionnaire

Psychological skills training refers to the systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical activity self-satisfaction. Please indicate how much you agree with each of the statements below (*1 = strongly disagree, 7 = strongly agree*).

1. Psychological skills training can help athletes improve their mental toughness.
           1   2   3   4   5   6   7

2. If an athlete on my team asked my advice about personal feelings of failure related to sport, I might suggest using psychological skills training.
           1   2   3   4   5   6   7

3. I would not want to use psychological skills training with my team because other coaches would harass me.
           1   2   3   4   5   6   7

4. There are certain problems that should not be discussed outside one's immediate family.
           1   2   3   4   5   6   7

5. A good idea for avoiding personal worries and concerns is to keep one's mind on the job.
           1   2   3   4   5   6   7

6. I would like to have the assistance of a sport psychology consultant to help me better understand my team.
           1   2   3   4   5   6   7

7. I would feel uneasy using psychological skills training with my team because some people would disapprove.
           1   2   3   4   5   6   7

8. There is something respectable in the attitude of athletes who are willing to cope with their conflicts and fears without resorting to professional help.
           1   2   3   4   5   6   7

9. If I utilized psychological skills training to help me coach better, I would not want other coaches to know about it.
           1   2   3   4   5   6   7

10. An athlete with emotional problems during sport performance would benefit from psychological skills training.
            1   2   3   4   5   6   7

11. Having used psychological skills training is bad for an athlete's reputation.

          1   2   3   4   5   6   7

12. There are experiences in my life that I would not discuss with anyone.

          1   2   3   4   5   6   7

13. If I was worried or upset about my team's performance, I could see the benefits in using psychological skills training.

          1   2   3   4   5   6   7

14. Emotional difficulties tend to work themselves out in time.

          1   2   3   4   5   6   7

15. I think psychological skills training would help my team perform better under pressure.

          1   2   3   4   5   6   7

16. I would not want someone else to know about my team's use of psychological skills training.

          1   2   3   4   5   6   7

17. Psychological skills training could help my team fine-tune their performance.

          1   2   3   4   5   6   7

18. If my team used psychological skills training, I would not want other coaches to know about it.

          1   2   3   4   5   6   7

19. At times I have felt lost and would have welcomed the professional advice of a sport psychology consultant.

          1   2   3   4   5   6   7

20. I would think less of my athletes if they were to use psychological skills training.

          1   2   3   4   5   6   7

21. Athletes with a strong character can get over mental conflicts by themselves.

          1   2   3   4   5   6   7

Appendix G

Revised Mental Skills Questionnaire (MSQ)

Psychological Skills Training Behaviours

Psychological skills training refers to the systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical activity self-satisfaction. Think about how often you use mental training when coaching your athletes. Rate how often you incorporate the psychological skills below into your coaching (*1 = very infrequently, 7 = very frequently*).

1. **Imagery Ability**
   (The use of all the senses to re-create or create an experience in the mind)
      1   2   3   4   5   6   7

2. **Mental Preparation**
   (The use of imagery and/or other non-physical processes to prepare an athlete for the execution of a skill)
      1   2   3   4   5   6   7

3. **Self-Confidence**
   (Athletes' belief that they are competent and can succeed in a particular task)
      1   2   3   4   5   6   7

4. **Anxiety and Worry Management**
   (The use of physical on nonphysical processes that help athletes deal with stress)
      1   2   3   4   5   6   7

5. **Concentration Ability**
   (Athletes' ability to focus on relevant information during competition and to control their thoughts)
      1   2   3   4   5   6   7

6. **Relaxation Ability**
   (Teaching athletes coping skills to help them attain physical relaxation prior to, during, or after the execution of a skill)
      1   2   3   4   5   6   7

7. **Motivation**
   (Enhancing the psychological factors that energize, direct, and regulate the behaviours of athletes)
      1   2   3   4   5   6   7

Appendix H

Coaching Competence Scale (CCS)

Coaching Competence Scale

Coaching competency refers to the extent to which coaches affect the learning and performance of their athletes. Think about how competent you believe your coach to be. Rate his or her competence for each of the items below (*1 = not at all confident, 7 = extremely confident*).

How competent is your head coach in his or her ability to –

1. help athletes maintain confidence in themselves?

        1   2   3   4   5   6   7

2. recognize opposing team's strength during competition?

        1   2   3   4   5   6   7

3. mentally prepare his/her athletes for game strategies?

        1   2   3   4   5   6   7

4. understand competitive strategies?

        1   2   3   4   5   6   7

5. instil an attitude of good moral character?

        1   2   3   4   5   6   7

6. build the self-esteem of his/her athletes?

        1   2   3   4   5   6   7

7. demonstrate the skills of his/her sport?

        1   2   3   4   5   6   7

8. adapt to different game situations?

        1   2   3   4   5   6   7

9. recognize opposing team's weakness during competition?

        1   2   3   4   5   6   7

10. motivate his/her athletes?

        1   2   3   4   5   6   7

11. make critical decisions during competition?

        1   2   3   4   5   6   7

12. build team cohesion?

        1   2   3   4   5   6   7

13. instil an attitude of fair play among his/her athletes?

        1   2   3   4   5   6   7

14. coach individual athletes on technique?

        1   2   3   4   5   6   7

15. build the self-confidence of his/her athletes?

        1   2   3   4   5   6   7

16. develop athletes' abilities?

        1   2   3   4   5   6   7

17. maximize his/her team's strengths during competition?

        1   2   3   4   5   6   7

18. recognize talent in athletes?

        1   2   3   4   5   6   7

19. promote good sportsmanship?

        1   2   3   4   5   6   7

20. detect skill errors?

        1   2   3   4   5   6   7

21. adjust his/her game strategy to fit his/her team's talent?

        1   2   3   4   5   6   7

22. teach the skills of his/her sport?

        1   2   3   4   5   6   7

23. build team confidence?

        1   2   3   4   5   6   7

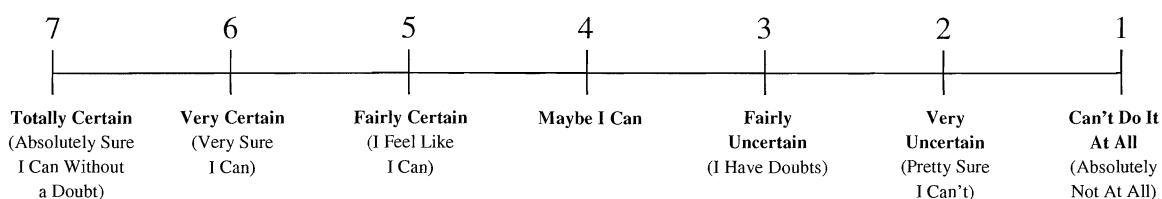24. instil an attitude of respect for others?

        1   2   3   4   5   6   7

Appendix I

Sport-Confidence Inventory (SCI)

Sport-Confidence Inventory

Athletes need many different abilities to succeed (e.g., physical skills, mental focus, optimal fitness). In this survey, you are asked to assess many of your abilities as an athlete.

Your answers will be strictly confidential. Please answer as you really feel, being totally honest (as opposed to answering as you would LIKE to feel or think that you are SUPPOSED to feel). All athletes are different in their abilities, and there are no right or wrong response.

7	6	5	4	3	2	1
Totally Certain (Absolutely Sure I Can Without a Doubt)	Very Certain (Very Sure I Can)	Fairly Certain (I Feel Like I Can)	Maybe I Can	Fairly Uncertain (I Have Doubts)	Very Uncertain (Pretty Sure I Can't)	Can't Do It At All (Absolutely Not At All)

Keep in mind that 7 and 1 represent **absolute levels** in which you are totally certain that you can do this or absolutely sure that you cannot.

HOW CERTAIN ARE YOU THAT ... (CIRCLE ONLY ONE NUMBER FOR EACH ITEM)

7   **Totally Certain** (ABSOLUTELY sure I CAN without a doubt)
6   **Very Certain** (VERY SURE I CAN)
5   **Fairly Certain** (I feel like I CAN)
4   **MAYBE I Can**
3   **Fairly Uncertain** (I have DOUBTS)
2   **Very Uncertain** (PRETTY SURE I CAN'T)
1   **Can't Do It At All** (ABSOLUTELY NOT AT ALL)

1.   you can **execute the physical skills** necessary to succeed?

   7   6   5   4   3   2   1

2.   you can keep **mentally focused** throughout the competitive event?

   7   6   5   4   3   2   1

3.   you can **bounce back** from performing poorly to successfully execute your skills?

   7   6   5   4   3   2   1

4.   your **physical training** has **prepared** you enough to succeed?

                              7   6   5   4   3   2   1

5.   you can successfully **make critical decisions** during competitions?

                              7   6   5   4   3   2   1

6.   you can **regain your mental focus** after a performance **error**?

                              7   6   5   4   3   2   1

7.   your **physical fitness level** will allow you to compete successfully?

                              7   6   5   4   3   2   1

8.   you can effectively **use strategy** needed to succeed?

                              7   6   5   4   3   2   1

9.   you can **overcome doubt** after a poor performance?

                              7   6   5   4   3   2   1

10.   you can successfully **perform the physical skills** required in your sports?

                              7   6   5   4   3   2   1

11.   you can **maintain the mental focus** needed to perform successfully?

                              7   6   5   4   3   2   1

12.   you can **overcome problems and setbacks** to perform successfully?

                              7   6   5   4   3   2   1

13.   you have the **physical preparation** that is needed to compete successfully?

                              7   6   5   4   3   2   1

14.   you can successfully **manage your nervousness** so that it doesn't hurt your
      performance?

                              7   6   5   4   3   2   1