

The Effects of a Competition Routine Intervention on Youth Swimmers' Competition  
Anxiety, Confidence and Performance

by

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### Abstract

The purpose of this study was to examine the effects of a competition routine intervention on youth swimmers' competition anxiety, confidence and performance. Participants of this study were youth swimmers ( $n = 4$ ; female) between the ages of 12-16. Through the use of a multiple-baseline, single-subject design, participants received a competition routine intervention involving imagery, positive self-talk and a relaxation deep-breathing technique. Mixed methods were used, with participants completing the Competitive State Anxiety Inventory for Children questionnaire prior to their swim race and a reflective questionnaire following their swim race. Participants also took part in a follow-up interview upon completing the study. Participants showed no considerable decrease in cognitive and somatic anxiety, or increase in self-confidence or performance following the intervention. However, reflective questionnaire and interview results showed that participants perceived a positive improvement in all of these areas and found the intervention beneficial.

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The Effects of a Competition Routine Intervention on Youth Swimmers' Competition  
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**Chapter I: Introduction**

Many people across Canada engage in sport, at varying levels of participation. In youth sport participation, children generally follow one of three trajectories: elite performance through early specialization, elite performance through sampling or recreational participation through sampling (Côté & Fraser-Thomas, 2011). Sampling in sport is described as children who participate in several sports and activities at a young age with the emphasis on motor development and enjoyment (Côté & Fraser-Thomas, 2011). Early specialization in sport is described as children choosing to focus on a single sport, with training and competition year round (Wiersma, 2000). This type of early training is meant to lead the child to top levels of competition (Wiersma, 2000). Children are beginning to specialize in sports at younger ages, with the hope of developing into high performance athletes as youths.

The specialization route has a price, with many of the child athletes unable to cope with stress brought on by competing at high levels (Nash, 1987). Competing can be a stressful situation, with pressure being placed on young athletes to perform well. Stress and anxiety associated with competing may lead to negative feelings linked to burnout by early specialization athletes (Nash, 1987; Strachan, Côté & Deakin, 2009). Child and youth athletes need to be given methods of coping with stress and anxiety related to competing at a young age, at very high levels. One way of providing support to help youth deal with the stresses of high-level competition is by using techniques in applied sport psychology.

Sport psychology offers mental skills training as a way to help deal with stress and anxiety, which in turn can provide a more positive experience for children and youth in sport. Positive experiences early on can lead to continued sport participation through to adulthood, rather than burnout and negative feelings associated with sport (Wiersma, 2000). Early specializers specifically may need mental skills training in relation to the stress and anxiety associated with competing, as it is more prevalent in their sport trajectory (Wiersma, 2000). One of the sport psychology techniques often used with adult athletes in competition settings is competition routines. Competition routines are a combination of different mental skills, used in a routine format before a competition event. The competition routine can be used to help athletes feel more prepared both psychologically and physically before their competition begins. Competition routines have demonstrated effectiveness with adult athletes to reduce competition anxiety and increase self-confidence in competition contexts (Kendall, Hrycaiko, Martin, & Kendall, 1990). Even though competition routines have been shown to be an effective sport psychology technique for adult athletes (Kendall et al., 1990), there is currently very little literature on youth athletes and the use of competition routines. Youth athletes should be given as many tools as necessary to provide them with a positive competition experience. This study provided insight into the use of competition routines by youth athletes and the effects the routines had on the swimmers' competitive experience. Although it may be impossible to eliminate the early specialization trajectory for youth, giving athletes proper support during their training career may prove to be beneficial for their continued well-being.

## **Chapter II: Literature Review**

Sport psychology can help athletes develop mental skills that can interplay with the physical skills already used in sport. Mental skills are helpful for adult athletes as well as youth athletes who are competing at a high level. Since many athletes invest heavily in sport at young ages (Nash, 1987; Wiersma, 2000), it is important to look at the motivation behind their behaviour. Understanding motivation is crucial in maximizing human performance and positive experiences in sport (Paskevich, Dorsch, McDonough, & Crocker, 2007). In order to explain motivation, Self-determination theory looks at the psychological needs behind motivational behaviours. This theoretical perspective offers the best explanation of the dependent relationship between motivation and the fulfillment of three psychological needs which are pertinent to elite level child athletes.

### **Theoretical Foundations**

**Self-Determination Theory.** According to the Self-determination theory (Ryan & Deci, 2000), motivation is seen on a continuum, with amotivation, or the absence of motivation, on one end and intrinsic motivation, performing a behaviour for inherent enjoyment, on the other. Extrinsic motivation follows amotivation, with four stages explaining how different external rewards can influence behaviour. These four stages are external, introjected, identified and integrated motivation. External motivation constitutes performing a behaviour to fulfill an external demand. Introjected motivation is performing a behaviour to avoid negative emotions. Identified regulation is performing a behaviour solely because it is linked to personal importance or value. Finally, integrated regulation consists of performing a behaviour based on achieving outside goals for one's self, rather than inherent enjoyment of the activity (Ryan & Deci, 2000). Different

motivational states influence athletes to perform towards accomplishing goals, however when intrinsic motivation is high, athletes display behaviours because of enjoyment and interest, which may produce a more positive experience in sport (Paskevich et al., 2007).

Self-determination theory is also comprised of three innate psychological needs that explain human motivation and behaviour based on individual differences and contextual influences (Ryan & Deci, 2000). These needs are autonomy, competence and relatedness. Autonomy refers to the extent to which an individual feels in control and responsible for the initiation of behaviour. Athletes can experience autonomy when they feel they have some power and choice over their sport behaviour (Paskevich et al., 2007). Competence comes from individuals having opportunities to apply their capabilities and feeling able to achieve goals and desired outcomes (Ryan & Deci, 2000). Competency can also come from the athlete's perception of control over their environment (Weinstein & Ryan, 2011). Competency can be enhanced for the athlete by achieving challenging goals and receiving informative criticism (Paskevich et al., 2007). Finally, relatedness is defined as the extent to which individuals feel a sense of belongingness and connectedness to others in their social environment (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; Ryan & Deci, 2000). An athlete's environment can provide a context in which the three needs are satisfied, providing them with a greater sense of motivation and well-being (Weinstein & Ryan, 2011). Research also shows that motivation related to control rather than autonomy can have negative implications relating to stress in situations (Weinstein & Ryan, 2011). However, having an autonomous motivational orientation can result in better reception to stressful situations, and seeing obstacles as challenges rather than threats (Weinstein & Ryan, 2011). For

athletes, this could mean better coping with stressful situations, such as competitions. All three basic psychological needs directly relate to extrinsic and intrinsic motivation, and play an important role in the participation and behaviour of high level athletes.

**Individual Zone of Optimal Functioning Model.** Although the stress of competition can lead to anxiety for young athletes, according to Jokela and Hanin (1999), certain levels of precompetitive state anxiety actually help athletes produce a more optimal competition performance. This theory is called the Individual Zone of Optimal Functioning (IZOF). According to the IZOF model, each athlete has an individually optimal zone (high, moderate, low) of anxiety intensity. Through the IZOF model, it is predicted that individuals have more successful performances when they are in or near their preferred zone (Davis & Cox, 2002; Jokela & Hanin, 1999). The IZOF model has three basic assumptions that have been supported through experiments in cross-cultural studies (Salminen, Liukkonen, Hanin, & Hyvönen, 1995). The first: athletes can recall their pre-competition state anxiety levels fairly accurately following good and bad performances. Secondly: athletes can generally predict their state anxiety levels up to two days prior to competing. Thirdly, athletes with pre-competition state anxiety levels within their optimal zone perform better than athletes who are outside their zone (Salminen et al., 1995).

The theory argues that intensity and direction of state-anxiety can be beneficial to performance (Robazza, Pellizzari & Hanin, 2004). Moreover, highly skilled athletes perceived precompetition anxiety as facilitative compared with lower skilled athletes, who found it debilitating (Jones & Swain, 1992). The IZOF model suggests that since sport is repetitive, it is possible to develop consistent emotional patterns based on past

competitive experiences (Hagtvet & Hanin, 2007; Kouli, Bebetos, Kamperis, & Papaioannou, 2010). For example, if an athlete notices that higher levels of anxiety helps them to focus consistently over several competitions, then it can lead to a positive attitude towards anxiety (Hagtvet & Hanin, 2007). With this knowledge, it is key to finding the individual level of anxiety that creates a positive competitive context.

What makes the IZOF model difficult to generalize is the individual zones differ. What is a low emotional intensity zone and what is a high emotional intensity zone for one athlete can be completely different for another athlete (Salminen et al., 1995). It is necessary that athletes become aware of the differences between their optimal and dysfunctional states in order to stay in the optimal state before and during competition. This can produce better performances, but it is not possible if the athlete cannot distinguish between the states (Kouli et al., 2010). This also means that what mental skills each individual athlete uses to reach their optimal zone could be very different.

### **Mental skills**

It is vital to provide athletes with skills to satisfy their innate psychological needs while in situational contexts, such as competitions. All three innate needs have a significant relationship to emotional states in competition contexts. According to Self-determination theory, an athlete who feels more in control of their behaviour and the situation should feel higher levels of autonomy in a competition setting (Deci & Ryan, 2000). Secondly, as anxiety decreases and confidence increases, an athlete's perception of competence in their competition setting will also increase (Deci & Ryan, 2000).

Much research has been done on interventions using mental skills to improve sport performance. These studies are mainly focused on the effect from using one specific

skill, such as imagery (e.g., Vadocz, Hall, & Mortiz, 1997) or self-talk (e.g., Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009; Johnson, Hrycaiko, Johnson, & Halas, 2004). An improvement in areas such as performance, confidence, and self-efficacy are among the benefits that have been found in studies focusing on a single mental skill.

**Imagery.** Imagery is a mental skill used by athletes where they mimic a real experience in their mind. Athletes consciously use imagery to experience an image or situation with their senses without actually experiencing the real thing (White & Hardy, 1998). Imagery may be used to analyze past performance, reduce anxiety, mentally rehearse race or match strategies or enhance self-confidence (White & Hardy, 1998). Paivio's (1985) model of imagery rehearsal on motor performance sees imagery as having a motivational or cognitive role, while operating at a general or specific level. Motivational general imagery can be effective in achieving different emotional states, based on imaging goal setting and achievement. Cognitive functions of imagery are effective in enhancing specific skills (Paivio, 1985). Memory also plays an important role in Paivio's (1985) model, and imagery rehearsal can only be as accurate as a person's memory or knowledge of a specific skill. Motivational general imagery has been further classified into two categories: motivational general-arousal (MG-A) and motivational general-mastery (MG-M) imagery (Gregg & Hall, 2006). Motivational general-arousal (MG-A) imagery is used to image the arousal and anxiety that is associated with competing. Motivational general-mastery (MG-M) imagery is used to raise levels of self-confidence and control.

Several types of MG-A and MG-M imagery scripts were used in a study with 40 intercollegiate athletes, both male and female, measuring anxiety and confidence associated with imagery (Cumming, Olphin, & Law, 2007). MG-M, MG-A psyching-up and MG-A coping imagery scripts gave athletes a significant increase in perceived confidence and their use was also a predictor of significantly better performances achieved by athletes. These three types of imagery were perceived by athletes to be significantly more helpful than relaxing and anxiety imagery (Cumming et al., 2007). It is important to note that imagery use by youth athletes is similar to imagery use by adult athletes in that they use all five functions of imagery (Munroe-Chandler, Hall, Fishburne & Strachan, 2007). Youth athletes use imagery most often during training, prior to competition, as well as during a competition. Youth athletes also predominantly use the cognitive and motivational functions of imagery (Munroe-Chandler et al., 2007).

Imagery can be used to significantly increase confidence and decrease anxiety associated with competition (e.g., Page, Sime, & Nordell, 1999; Vadocz et al., 1997). More specifically, in a study with 40 intercollegiate female swimmers, researchers found that after delivering an imagery intervention, swimmers increased their precompetitive confidence and reduced their precompetitive anxiety (Page et al., 1999). The reduction in anxiety was noted both somatically and cognitively. Somatic anxiety consists of the physical symptoms resulting from stress, while cognitive anxiety is the mental symptoms caused by stress (Burton, 1988). However, these changes were minimal and the researchers attributed it to the singular use of imagery.

As imagery is a tool that is more effective when practiced regularly, it is essential for athletes to use it consistently in order for results to be significant (Vadocz et al.,



1997). The researchers also measured the participants' perceptions of anxiety following the imagery intervention and found that their perception of anxiety was more positive upon completing the intervention (Page et al., 1999). This is a beneficial finding in that it reiterates the importance of controlling one's emotions in order to achieve the maximum benefits in a particular situation. Also, by attaching positive connotations to anxiety, the athlete may feel more competent in their sporting abilities even when anxious.

**Self-Talk.** Self-talk is a mental skill used to manage arousal in athletes. It is also a cognitive strategy that can be used to enhance performance (Hatzigeorgiadis, Zourbanos, Mpoupaki, & Theodorakis, 2009; Hatzigeorgiadis, Zourbanos, Goltisios, & Theodorakis, 2008; Johnson et al., 2004). It is suggested that self-talk functions as a way to alter emotions in two different ways (Jones, 2003). First, replacing a negative thought or statement with a positive thought or statement in order to stop the negative thought from leading to a negative emotional state (e.g., turning "I'm scared" into "I'm ready"). Second, self-talk can be used by saying or thinking a positive self-statement in order to produce a desired emotional state (e.g., I'm excited for this race; Jones, 2003). There are also two different functions of self-talk, motivational and cognitive (Hatzigeorgiadis et al., 2009). Cognitive self-talk is instructional with a focus on skill learning and development. It is predominantly used for tasks requiring accuracy and precision (e.g., saying "strong push" on a starting block; Hatzigeorgiadis et al., 2008). Whereas motivational self-talk is used more for increasing drive and effort in the individual. This function of self-talk may be more useful for gross motor tasks and tasks requiring strength and endurance (e.g., saying "I got this"; Hatzigeorgiadis et al., 2009).

Findings from a study done by Johnson et al. (2004) showed that self-talk is effective in improving specific tasks as well as whole performances. The study was done with 4 female youth soccer players, and self-talk was shown to improve soccer shooting performance (Johnson et al., 2004). In another study with 72 youth tennis players with a mean age of 13, motivational self-talk was shown to significantly increase self-efficacy and improve performance versus a control group (Hatzigeorgiadis et al., 2008). These two studies have also shown that self-talk is beneficial for youth athletes, not just adult athletes (Hatzigeorgiadis et al., 2008; Johnson et al., 2004). Imagery and self-talk are just two of the mental skills used as ways to cope with stress and anxiety in sport performance.

**Anxiety Management.** Anxiety is defined as a multidimensional concept, with somatic, cognitive and behavioural components (Polman, Rowcliffe, Borkoles, & Levy, 2007). The somatic and cognitive components interact with the behaviours shown as responses to these types of anxiety (Polman et al., 2007). There are several issues that cause stress and anxiety associated with competition situations. Personal issues (e.g., goals or expectations about competition outcomes), environmental issues (e.g., competitive environment) and team issues (e.g., coaching styles) may all cause anxiety for athletes (Vosloo, Ostrow, & Watson, 2009). As these issues are mostly uncontrollable, it is necessary to find ways to control the athlete's anxiety levels resulting from these stressors.

Research suggests that athletes perform better when they reach an optimal moderate state of anxiety, however if the anxiety increases or decreases from that level, it has been shown to decrease performance (Robazza et al., 2004; Burton, 1988). Somatic

anxiety may have a greater influence on the outcome of a complex and short task, as longer tasks provide athletes with time for somatic anxiety to dissipate. If a task is more complex, lower levels of arousal provide the athlete with a more optimal performance state (Burton, 1988).

Wadey & Hanton (2008) completed research with 15 adult elite athletes regarding the psychological skills the athletes used in order to cope with competition anxiety. The four skills frequently used by these athletes were goal-setting, imagery, self-talk and relaxation techniques (Wadey & Hanton, 2008). According to the participants, these skills were used in order to gain perceived control over their anxiety responses (Wadey & Hanton, 2008). From this research, Wadey & Hanton (2008) suggested introducing basic psychological skills to athletes to give them coping strategies for dealing with stressful situations. In a study with 28 male and female intercollegiate swimmers (ages ranging from 18 to 23), researchers found that the swimmers with higher levels of somatic and cognitive anxiety swam slower than the participants with lower levels of anxiety (Burton, 1988).

Emotions can have an impact on cognitive functioning whether they are positive or negative (Jones, 2003). Anxious emotions may have a negative effect by distracting the athlete from the task at hand. However, an increase in arousal may help an athlete narrow their focus, and perform at a more optimal level (Davis & Cox, 2002; Jokela & Hanin, 1999). With this in mind, different mental skills are associated with arousal control, such as relaxation deep-breathing techniques to decrease arousal.

Using different methods of controlling emotions help athletes feel more competent in their environment. Jones (2003) maintains that there are a number of

strategies that can be used to control arousal. Some of these include progressive muscular relaxation, listening to music, and centering. Maynard, Hemmings, and Warwick-Evans (1995), found that an applied relaxation technique was helpful in decreasing somatic and cognitive anxiety for adult semi-professional soccer players. The applied relaxation technique was a combination of progressive muscle relaxation, relaxation cues and deep breathing (Maynard et al., 1995). Another relaxation technique, diaphragmatic breathing, helps increase the oxygen being delivered through the body, which can aid in relaxing the athlete (Munroe-Chandler & Hall, 2011). Centered deep breathing is also a widely used breathing technique, which has the individual in a relaxed position, focused on their breathing and releasing tension from the body (Tkachuk, 1997). While using a breathing relaxation technique, it is necessary to ensure it is one that works with the athlete and is producing the desired physiological and emotional state; otherwise it can become a hindrance to the athlete (Jones, 2003). If used appropriately, a relaxation technique can be beneficial in calming competition anxiety.

Self-confidence can also play a role on competitive emotional states. In a study with young swimmers, researchers found that participants with higher levels of self-confidence resulted in them attributing their performance to internal factors. These participants also believed they would achieve a good performance in the future (Polman et al., 2007). Interestingly, there was no significant relationship found between cognitive anxiety, self-confidence, objective swimming results and subjective individual perceptions of results (Polman et al., 2007). However, higher levels of cognitive anxiety were associated with lower levels of external control in the competitive context (Polman et al., 2007).

**Competition Routines**

While individual techniques have all been shown to benefit athletes in different ways, finding a combination of several different mental skills can be helpful in competition settings. It is important to give athletes a mental ‘toolkit’, where they can choose which skills are best suited to their individual needs during a competition, hence a competition routine. A competition routine is defined as a mental skills package that includes several different skills to maximize sport performance, control arousal and reduce performance anxiety. These skills are used in a routine format before or during a competition event, depending on the sport context (Cohn, 1990). This routine is meant to prepare athletes psychologically and physically for their event (Bertollo, Saltarelli, & Robazza, 2009). According to Cohn (1990), preperformance routines can help athletes by recalling task-specific behaviours that result in the desired outcome. That aspect, linked with the autonomous feeling of performing a competition routine, shows how competition routines can fulfill the innate needs in a competition setting.

In a study by Cohn, Rotella and Lloyd (1990), three male, intercollegiate golfers were provided with a preshot routine intervention. In a multiple baseline design, the golfers were provided with this intervention after at least five observations, which continued for a total of 13 observations. From these observations, the researchers found that the golfers performed the routine regularly post-intervention, and the participants all expressed perceptions of improvement in their golf performance. Golf performance was shown to improve after a four month follow up period, where the participants were allowed to practice physically and mentally at their own discretion (Cohn et al., 1990). Additionally, researchers found that when athletes adhered to a competition routine, the

result was a more successful athletic performance in comparison to athletes who did not use their competition routine (Cohn et al., 1990).

It has been shown in past research that competition routines can help athletes stay focused on their task and feel more in control of themselves and the situation (Bertollo et al., 2009). Additionally, since mental skills can give an athlete a feeling of being in control of their situation by reducing anxiety and enhancing feelings of confidence (Mamassis & Doganis, 2004), a combination of mental skills in the form of a routine may also help to improve sport performance. This was evident in a study done by Patrick and Hrycaiko (1998), where endurance runners showed a significant improvement in their 1,600 m event times after a mental training package including imagery, self-talk and relaxation techniques was introduced. Each participant was involved in an intervention in which they received a mental training package, and the athletes used the mental skills before competitions and practice, as a competition routine. All the athletes found the mental skills package useful, and as they were satisfied with the results, they reported they would maintain and improve on the skills taught to them (Patrick & Hrycaiko, 1998).

Researchers have also found that competition routines can be effective in improving specific physical skills (e.g., Kendall et al., 1990). In a study with four female intercollegiate basketball players, competition routines were shown to significantly increase the performance of a defensive skill in a basketball game (Kendall et al., 1990). Also, participants reported feeling more relaxed, less distracted and having a more confident attitude in the game after using the competition routine (Kendall et al., 1990). Results from this study suggest that a combination of mental skills can be used more

effectively to increase confidence, and lower anxiety rather than just the use of a single mental skill. Through social validation questionnaires, researchers are consistently finding an increase in participants' confidence after use of competition routines, even if they are not directly testing for this result (Kendall et al., 1990; Patrick & Hrycaiko, 1998).

Adult elite athletes have been the focus of much of the research using competition routines to attain better sport performance (Cohn et al., 1990; Kendall et al., 1990; Patrick & Hrycaiko, 1998). However, there is a lack of research on competition routines implemented with youth athletes, even though much of the research done with youth athletes and mental skills supports positive outcomes associated with the use of these skills (Johnson et al., 2004; Mamassis & Doganis, 2004). Presently, there is only one published study on competition routines with young tennis athletes (Mamassis & Doganis, 2004). Nine athletes were involved in this study; five of the athletes received an intervention to introduce mental skills, with case studies being done with two of the participants for a more in-depth look at their intervention. The other four athletes were a part of a control group that did not receive a mental skill intervention. After a 25 week intervention program, a competition routine was implemented with each athlete involving different combinations of imagery, self-talk, relaxation techniques, thought stopping, and goal setting (Mamassis & Doganis, 2004). The researchers used the CSAI-2 in pre and post-intervention tests. Results showed that there was an improvement in the athlete's performance and decreased levels of somatic and cognitive anxiety. Athletes also displayed higher levels of self-confidence in post-tests (Mamassis & Doganis, 2004).

**Rationale**

There are three main trajectories for youth who participate in sports: recreational participation through sampling, elite performance through sampling and elite performance through early specialization (Fraser-Thomas & Côté, 2009). To achieve expert level performance, many children are beginning to specialize in one sport from an early age. One reason for this may be the opportunity to specialize from an early age is more convenient, with sport organizations providing ample support for the children who chose to take the specialization route. The youth athletes who fall into this category are an important demographic to study as they often become the expert level performers in their given sports (Strachan et al., 2009).

A benefit of developing competition routines for youth athletes is to help them better understand what they are able to achieve in their sport setting. Adult athletes and junior athletes differ greatly in the sense that junior athletes (between the ages of 12-14) have shown that they only possess a vague idea of what they are able to accomplish in their sport (Mamassis & Doganis, 2004). With a competition routine program in place, junior athletes may be able to increase their level of self-awareness for a positive effect on future goals in their sport.

Competition routines give athletes the ability to remain in control of their precompetitive anxiety, because “although an individual may not be able to control the stressful event, the body’s reaction to it does appear to be modifiable” (Page et al., 1999, p. 466). As the next step in youth competition routine research, it is necessary to create routines for young athletes consisting of several mental skills that have, on their own, proven to have a significant positive effect on elevating confidence and diminishing



anxiety. A competition routine can become a consistent method to deal with the stresses associated with competing. By using their routine, athletes will become more aware of their individual zone of optimal functioning, and can distinguish successful states from less successful states in order to enter and remain in their optimal zone during their sport performance (Kouli, Bebetos, Kamperis & Papaioannou, 2010). Currently, there is not enough research showing how young athletes can benefit from the use of mental routines like their adult counterparts.

This study aimed to increase the swimmers' self-awareness and knowledge of sport psychology skills, while broadening the literature on competition routine use with junior athletes. As there have been numerous studies conducted with adult athletes using competition routines, it was necessary to continue the area of research on youth athletes. It was hypothesized that a competition routine intervention would reduce competition state anxiety, enhance confidence and enhance sport performance for junior high performance swimmers.

### **Chapter III: Methods**

#### **Participants**

A purposive sample of five youth swimmers was recruited. A small sample size was concurrent with past multiple-baseline across-participants design research (Hrycaiko & Martin, 1996). In order to maintain integrity of the intervention process, five participants were deemed sufficient to complete the study. Participants 1, 2 and 4 were 13-year old females, who trained 12 hours per week, with 5 years of competitive swimming experience. Participant 3 was female, 15 years old, spent 12 hours training per week and had 5 years swimming experience. Finally, Participant 5 was male, 15 years old, trained 12 hours per week and had 4 years of competitive swimming experience. All participants had little to no past experience in mental skills training from a sport psychologist.

#### **Sampling Procedure**

Participants were sampled based on key demographic components such as age, training regimen, experience in swimming and past experience with sport psychology training. The coach recommended participants who fit within these demographic components and the researcher approached the parents with consent forms. The power imbalance between researcher and participant was addressed through the use of consent and assent forms (see Appendix A and Appendix B). Out of the participants approached, all five participated, however due to injuries, Participant 5 was unable to complete the study and was therefore eliminated from the analysis. Data was collected in swimming pools around Canada, with most of the pools being in Winnipeg. The follow-up interview data was collected in a classroom.

## Measures

The study consisted of a mixed methods approach. The Competitive State Anxiety Inventory for Children (CSAI-2C; Stadulis, MacCracken, Eidson, & Severance, 2002) was used to measure the three dependant variables: cognitive anxiety, somatic anxiety and self-confidence (see Appendix C). Cognitive anxiety is defined as the psychological symptoms of anxiety. Somatic anxiety is defined as the physiological symptoms of anxiety. While self-confidence is the belief in one's self, and one's abilities (Stadulis et al., 2002). The CSAI-2C is a 15-item instrument, with five items each in the cognitive anxiety, somatic anxiety and self-confidence subscales. Participants reported on these variables using a 4-point Likert scale, rating from 1 (not at all) to 4 (very much so), with scores ranging from five to twenty for each subscale (Stadulis et al., 2002).

Swim times were taken to measure performance. The performance times were measured by electric timer during races and recorded by the coach using a handheld stopwatch during time trials. The means from the times taken during the baseline phase and the post-intervention phase were calculated in order to measure the performance variable.

Participants were also asked to complete a reflection questionnaire (see Appendix D). In the questionnaire, participants were asked the following open-ended questions: 1) How did I use each mental skill in my routine before my event? 2) How did the routine make me feel before my event? (e.g., Did it make me feel more or less confident? Did I feel more or less anxious?).

Once the study was complete, follow-up interviews were done with each participant in order to gain more knowledge on their intervention experience. The follow-

up interview had four sections of questions (see Appendix E). The first section asked participants what they thought about each mental skill in the competition routine, how it was taught to them and what they thought about the individualization of each skill (e.g. What did you think about the imagery script portion of your competition routine? What did you think about making the script your own individual script specific for your race?). Additionally, the swimmers were asked what they thought about the competition routine as a whole, and how they came up with it in collaboration with the researcher (e.g. Overall, what did you think about coming up with your competition routine?). The participants were asked if they preferred how it was tailored for their individual needs, and if they would continue using it in the future (e.g. Is it something that you will continue to use in the future, why or why not?). Finally, they were asked if anything should have been done differently in their competition routine intervention (e.g. Do you think [the researcher] could have done anything differently to make the intervention better? What about the competition routine?).

### **Procedure**

After obtaining ethics approval, the CSAI-2C was given to participants during the baseline phase, before the intervention. The CSAI-2C was administered within an hour before each swim event or time trial. The baseline phase was used to track the variables of interest. The participants continued to receive the CSAI-2C after they had received the intervention. It was administered after the participant had performed the competition routine and prior to the same swim event at each competition in order to retain consistency.

Once the participants had received their intervention, they were required to respond to the reflection questionnaire. The questionnaire was administered once their swimming event was complete. Open-ended questions provided the participant with a chance to explain in their own words how they felt about the intervention experience (Patton, 2002). The answers to these questions were valuable in attaining personal insights and a deeper understanding of each participant's experience (Patton, 2002). Analysis of the reflective questionnaires was also useful in providing further information on the inter-rater reliability from participants' results of the CSAI-2C. Furthermore, open-ended questions provided the participant with a chance to explain in their own words how they felt about the intervention experience (Patton, 2002).

At the conclusion of the study, a third party was brought in to conduct the follow-up interviews. A third party was used in order to eliminate bias from participant responses, as the third party conducting the interviews had no prior knowledge of the research data or the participants. This also helped eliminate researcher bias on the data collected, since the interviewer was a neutral party. The follow-up interviews were conducted in a classroom near the swimmers' pool. Each interview lasted approximately 10 minutes. Participants were asked to further describe what they thought of the intervention process, and the effect they perceived the intervention and subsequent competition routine had on their competition experience.

A procedural checklist was completed during each intervention in order to maintain reliability of the intervention process for each participant (see Appendix F). A pilot study of the intervention was performed with a female springboard and platform diver, aged 15, with 7 years of competitive experience. The pilot data was collected to

ensure the reliability of the intervention process. This provided the researcher with further procedural integrity.

### **Experimental Design**

The single-subject, multiple-baseline across-participants design ensured internal validity due to the multiple replications of the intervention being delivered to several participants (Barker et al., 2011). Due to the multiple-baseline design, participants served as controls for each other, so there was no need for a control group. This design allowed the researcher to see the effectiveness of the intervention treatment with each individual, which was helpful with a small sample size (Barker, McCarthy, Jones, & Moran, 2011). Summed scores from each CSAI-2C dependant variable comprised data points that were monitored during the baseline phase. The order in which the participants received their intervention was based on when a participant had shown scores that were stable or in a direction opposite of what was predicted for the treatment for at least one variable (Hrycaiko & Martin, 1996). The interventions occurred during competition season, so the swimmers participated in swim meets approximately once a month, and time trials approximately once a week. Data collection took approximately four months to complete.

### **Intervention**

The intervention consisted of working with participants to make an individualized competition routine to use before competitive events. The interventions took place over four sessions of approximately 30 minutes each. These sessions consisted of meeting with the participant after their practice in order to not disrupt their training. During these sessions, the participants were taught how to use specific mental skills: imagery, self-talk and a deep-breathing relaxation technique. The first session focused on imagery, the

second on self-talk, the third on the deep breathing technique and the fourth session was a practice of the competition routine as a whole.

The imagery session introduced the participant to imagery, and together, the participant and primary researcher came up with an imagery script based on their swimming event. The imagery used during their competition routine consisted of Mastery-General Motivational imagery. The imagery portion was performed with the help of an imagery script that the participant listened to on their media player before competing. The imagery script focused on imagery related to MG-M imagery based on the results from Cummings and colleagues (2007). The script was created through the collaboration of the participant and the researcher.

The second session focused on positive self-talk. This session included an introduction to self-talk and the researcher and participant collaborated on five positive and motivational cue words or phrases to be used in the competition routine. The self-talk consisted of different cue words or phrases that the participant could repeat to themselves. (e.g., 'I'm ready', 'I can do this', 'I'm confident', 'I'm focused', 'I got this').

The third session introduced the participant to the relaxation technique. The relaxation technique consisted of a widely used centered deep breathing exercise suggested by G. A. Tkachuk (1997) in which the participant goes through a step-by-step breathing technique, focused on relaxation. The technique requires the individual to be in a relaxed position, focus on their breathing pattern, while imagining the tension in their body being released (Tkachuk, 1997). The exercise was used in the competition routine to control the swimmers' breathing and anxiety arousal. The fourth session with the participant had them practicing all three of these techniques in a competition routine

format, which they used before their specific swim race after the intervention was complete.



## **Chapter IV: Results**

Through the use of the procedural checklist, each intervention was delivered as intended. Based on the reflective questionnaires that participants filled out after each swim event following the intervention, they consistently performed their individualized competition routine, in the same format each time.

The CSAI-2C data was analyzed to see if each dependent variable (self-confidence, cognitive anxiety, somatic anxiety and swim performance) showed a change following the intervention. Visual inspection was used to analyze CSAI-2C data following the intervention. Visual inspection was useful due to the replication from each participant in order to make causal inferences (Barker et al., 2011). According to the visual inspection guidelines, changes in CSAI-2C data are significant based on immediacy and size of effect, as well as number of overlapping data points between baseline and post-intervention phases (Hrycaiko & Martin, 1996). Participant anxiety scores were compared with summed mean anxiety scores from the revised and validated CSAI-2C inventory (Stadulis et al., 2002). The revised inventory was taken from a sample of 632 children, ages 8-13 years. This comparison was done to evaluate the participants against a population norm. Swim time means were compared to find an increase or decrease from the baseline phase to the post-intervention phase.

Reflective questionnaire and follow-up interview data was analyzed using induction, based around phenomenological interpretation of the data (Patton, 2002). The phenomenon being assessed in this study was the experiences of the participants receiving a competition routine intervention and then using the competition routine before their swim events. These experiences were collected through the use of reflective

questionnaires and a follow-up interview of each participant following the completion of the study.

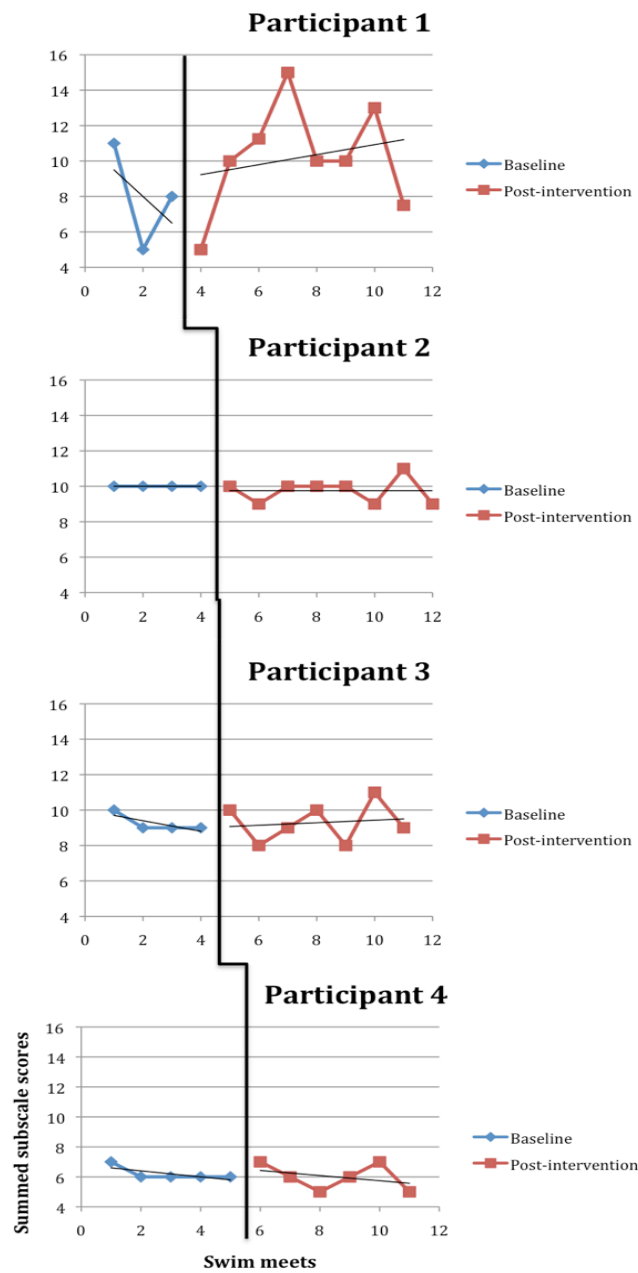


Figure 1. Cognitive Anxiety

**Cognitive Anxiety**

Based on visual inspection of the data from the CSAI-2C (see Figure 1), Participant 1's cognitive anxiety decreased immediately following the intervention then began to increase in the trend line, with several overlapping data points. Based on the population norm of 9.2 ( $M = 1.84$ ,  $SD = 0.75$ ), Participant 1 was below this level for much of her baseline ( $M = 8.0$ ), and slightly above this level for her post-intervention phase ( $M = 10.0$ ). Participant 2 saw continued stability immediately following her intervention, with a slight decrease through the post-intervention period. However, there were several overlapping data points. Participant 2 consistently remained slightly above the population norm in her baseline ( $M = 10.0$ ) and post-intervention phases ( $M = 9.8$ ). Participant 3 showed an increase in cognitive anxiety following her intervention then proceeded to decrease in trend following. She had many overlapping data points in comparison with the baseline phase. Based on Participant 3's trendline, she remained quite close to the cognitive anxiety population norm during baseline ( $M = 9.3$ ), and in the post-intervention phase ( $M = 9.3$ ). Participant 4 had many overlapping data points, but maintained a slightly decreasing trend following an immediate increase in her first data point after her intervention. She showed much variability in her post-intervention phase. Participant 4 showed considerably lower cognitive anxiety scores in comparison to the population norm during baseline ( $M = 6.2$ ) and post-intervention ( $M = 6.0$ ).

Participant 1 used the deep breathing portion of her competition routine to feel more relaxed and calm before beginning her race (e.g. "[to] calm myself before the race"). Participant 1 mentioned not feeling anxious when it was a time trial and not a real race. Participant 2 often said the competition routine would make her feel anxious

because she had to actually think about the race, rather than avoid thinking about it. She used the breathing technique to “not be as nervous”. Participant 3 explained the competition routine would make her feel less anxious and more relaxed.

### **Somatic Anxiety**

In comparison with the cognitive anxiety, Participant 1’s somatic anxiety decreased following the intervention showing the immediate effect of the intervention, with only one overlapping data point (see Figure 2). She then showed an increasing her trend in her data post-intervention. In comparison with the population somatic anxiety norm of 8.7 ( $M = 1.74$ ,  $SD = 0.78$ ), Participant 1 had much higher somatic anxiety scores during baseline ( $M = 11.00$ ). During post-intervention, she showed a decrease below the population norm ( $M = 8.00$ ). Participant 2 showed a slight decrease in somatic anxiety following her intervention, which then dropped considerably before increasing again to the same level as her baseline. She had several overlapping data points. Participant 2 was above the population norm during her baseline ( $M = 9.75$ ), and showed a decrease post-intervention before increasing considerably again ( $M = 8.88$ ). Participant 3 experienced a sizeable increase in somatic anxiety immediately following the intervention, after seeing a neutral trend during her baseline. She then showed a decreasing trend in her data during the post-intervention phase. Participant 3 had few overlapping data points. Her scores were below the population norm in her baseline ( $M = 7.50$ ) and above the population norm in her post-intervention phase ( $M = 9.43$ ). Participant 4 showed a decreasing trend in somatic anxiety during her baseline, which became stable following her intervention. This resulted in all overlapping data points. Similar to her cognitive anxiety results,

Participant 4's somatic anxiety scores were much lower than the population norm ( $M = 6.60$ ), and remained stable below the population norm post-intervention ( $M = 5.00$ ).

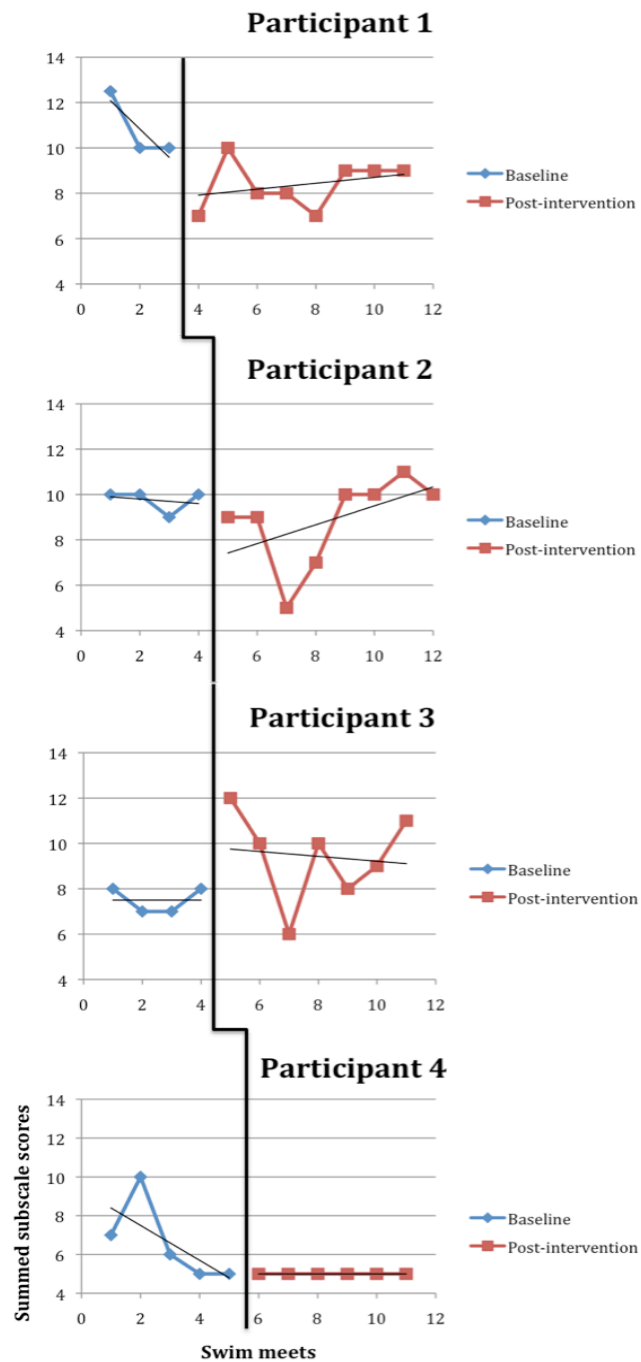


Figure 2. Somatic Anxiety

Participant 1 described feeling less anxious and more relaxed after the use of the competition routine in a real competition setting. However, in time trial settings she perceived feeling less nervous as it was not real. This could contribute to the decrease in somatic anxiety. Following her intervention, Participant 2 said the competition routine made her feel less anxious: “it calmed me down so that I was not so nervous and tense and I did well”. From then on, she fluctuated between feeling less and more anxious, explaining the increase in somatic anxiety data following such a dramatic decrease. Participant 3 would sometimes feel more anxious while doing the competition routine because she had to think about the race. Her feelings were supportive of the increase in the somatic anxiety data. However, she described using the deep breathing portion of the competition routine as a way to physically relax her, “I used the breathing to help me relax and loosen my muscles”. Participant 4 had a neutral trend post-intervention, and in each of her reflective questionnaires she said the competition routine made her feel less anxious, and more excited.

### **Self-confidence**

Based on visual inspection of the data from the CSAI-2C (see Figure 3), Participant 1’s self-confidence increased immediately after the intervention then decreased considerably before rising back up. She showed all overlapping data points. Participant 2 showed a slight increase following the intervention after a stable immediate first data point. There were numerous overlapping data points with the baseline phase. Participant 3’s self-confidence data showed an immediate effect, with a slight increase following the intervention. This increase continued throughout the post-intervention

phase, although with some variability. She also had many overlapping data points with the baseline phase. Participant 4's self-confidence showed an immediate stable data

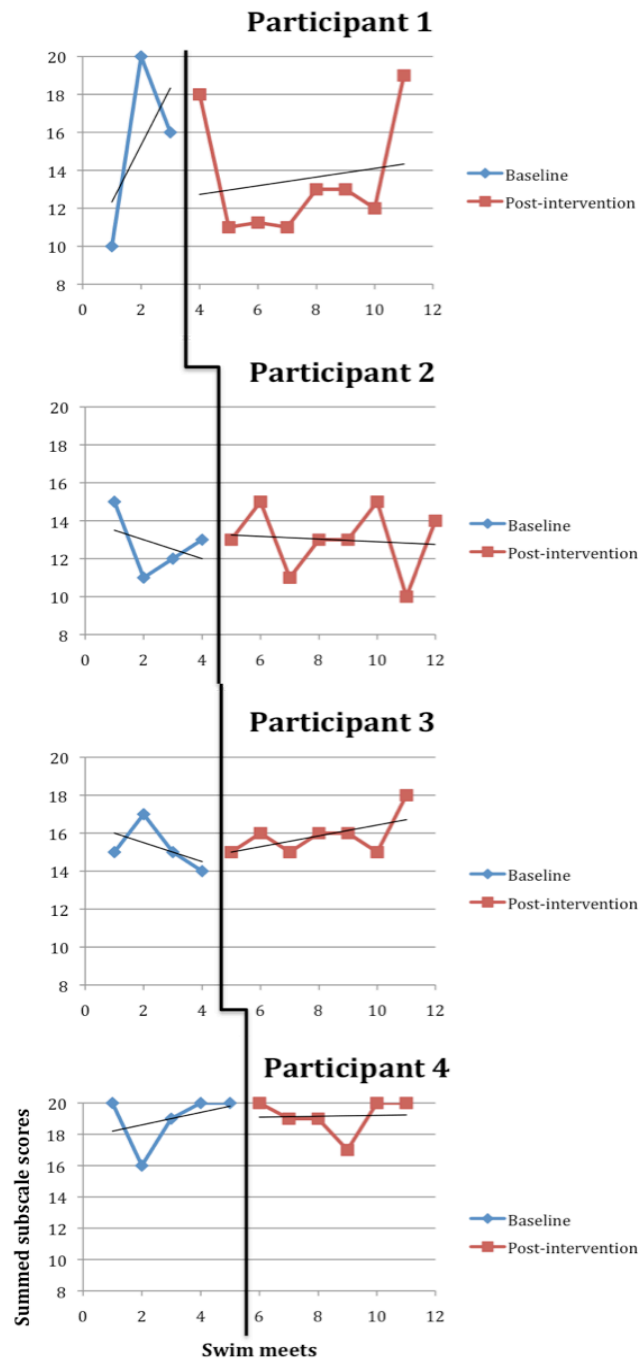


Figure 3. Self-confidence

point, then a slight decrease through the post-intervention phase. All of her data points were overlapping.

Participant 1 often worried about being “too confident” and “not nervous enough”. However towards the end of the study, she would say the competition routine made her more confident, without being overly confident. Finally, in her last reflective questionnaire, she said that the imagery script in her routine made her feel “confident and secure”. This would explain the immediate decrease, then increase in self-confidence data following her intervention. In her reflective questionnaires, Participant 2 perceived that using the competition routine made her feel more confident at every race and time trial. This is in line with her slight increase in the self-confidence data. Participant 3 showed a large increase in self-confidence data post-intervention, and she believed the competition routine helped her feel more confident in each race and time trial post-intervention. Although Participant 4 showed a minor decrease in self-confidence following her intervention, she perceived that the competition routine helped her to increase her confidence. In one statement she said about the competition routine, “it made me feel more confident because it helped me remember the tactics for my race and helped me to refocus”.

### **Performance**

Participant 1 showed an increase in mean swim times (see Table 1). However, it is important to note the fastest individual swim times before and after receiving the intervention were accomplished during real races, rather than time trials. Participant 2's mean swim times dropped slightly. During the post-intervention phase, she achieved a



Table 1

*Swim Time Performance Means*

	Baseline Swim Time mean	Post-intervention Swim Time mean
Participant 1	1:01.85	1:02.86
Participant 2	1:20.86	1:20.41
Participant 3	2:55.28	2:52.06
Participant 4	2:20.17	2:24.09

personal best time in her event. Participant 3 showed a substantial decrease in her swim time mean following the intervention, resulting in a personal best time in her event during this phase. Participant 4 showed a significant increase in swim time mean following her intervention.

In her reflective questionnaires, Participant 1 stated that she consistently used the imagery script first, as a way to go through the technical aspects of her swim before the race. In her last reflective questionnaire she even said, “by the way, I visualized myself going 1:02.90 and I swam a 1:02.90”. Participant 2 talked about using her positive self-talk to make her go faster and swim better, “I used words like powerful strong during my race to make me go faster”. This showed in her faster swim times post-intervention. Participant 3 showed a substantial decrease in swim times post intervention and perceived that her competition routine helped her feel more prepared to race, “it helped me get focused and reminded me of how to swim this race efficiently”. Participant 4 said using her competition routine made her feel excited to swim and ready to race, however she still showed a dramatic increase in swim time. It is important to note that the

participant's first race after receiving her intervention was the Canadian Olympic Trials.

As this was her first time attending such a high-pressured meet at a young age, it was not surprising to see such an increase in swim time at that event.

### **Follow-up Interviews**

The transcripts of the follow-up interviews were examined using inductive analysis techniques in which over-arching themes, and sub-themes were found. The data was then triangulated by two other researchers to ensure that the themes and sub-themes that were found were a reliable set. The triangulated results matched the original findings by the primary researcher, ensuring the validity of the analysis. Through the induction of the follow-up interview data, several common themes were found that were frequently mentioned by the participants. The theme of Mental Skills Training consisted of the sub-themes: Relaxation, Focusing on the Task, Accepting Nerves and Excitement. The second over-arching theme that was found was Preparation. The sub-themes under that category were: Knowledge of Ability, Readiness and Technical Strategy.

**Mental skills training. *Relaxation.*** The sub-theme of relaxation was found in the data, often associated with the deep-breathing technique. This technique was used to help control cognitive and somatic anxiety and lower arousal in order to bring the athlete into their zone of optimal performance (Jokela & Hanin, 1999). All participants in this study mentioned relaxation in their follow-up interviews. Participant 1 thought the deep breathing was helpful for her to relax before her race. She also mentioned using it for other things outside of swimming, such as other sports she participates in. She enjoyed the freedom to use the deep breathing when she chose to, and often used it when she felt nervous. Participant 2 said the deep breathing portion of the intervention helped her relax

before her race. She liked how she could use it when she felt nervous before she swam, rather than being told when to use it before her race. Participant 3 thought the deep breathing section was helpful for her to relax before the race and she also mentioned that it helped her release physical tension from past races before beginning her next swim. She liked the freedom of using the technique when she wanted to, because she felt if she used it too close to her swim she felt rushed. So having the control over when to begin the deep breathing for her was important. For Participant 4, the deep breathing helped her feel relaxed, but then she would start getting excited for her race, which she liked. She also liked the control of being able to use the deep breathing technique when she wanted because she timed it for when she thought would be the most beneficial to her.

***Focusing on the task.*** Participants all mentioned the competition routine helped give them an ability to focus on their race. This particular sub-theme had several dimensions, as sometimes participants would discuss how the competition routine would help them refocus after a past race, or actually focus on what they needed to accomplish, rather than the distractions happening around them. To each participant, focusing on the task meant something different yet it was equally important to them. Participant 1 discussed how the self-talk portion of the intervention was helpful for her to get herself refocused. She mentioned that the personalization of the self-talk words were helpful since certain words “mean something to my brain”. Participant 2 used the imagery script to help her focus on her race and visualize what the race would eventually feel like. She enjoyed how the script was individualized for her needs, so she could focus on her own race, and not think about someone else’s. She also enjoyed that she could choose what material went into the imagery script, rather than having it pre-written for her. Participant

3 thought the imagery script was helpful for her to focus on what she needed to do. She thought that having a personalized imagery script helped her focus on her own race, rather than think about someone else's. She liked that there was a basic outline for the imagery script that she could work from, and then change it to make it her own. She also used the self-talk portion of the routine to help her focus on herself, rather than the things going on around her. Similar to the participants two and three, Participant 4 felt the imagery script was helpful in refocusing her mind on her race. She said when she used the competition routine before her event; she found it "helped me stay focused on what I had to do". She thought having the imagery script personalized to her own needs was really helpful.

*Accepting nerves.* This sub-theme was often associated with focusing on the task due to the fact that three of the participants sometimes began to feel more anxious after being forced to think about their upcoming races. For participants 1, 2 and 3, having to focus on their upcoming race often led to an elevation of anxious feelings towards racing. Participant 2 said in her final reflective questionnaire that the competition routine made her feel more and less anxious. This was because she had to think about her race, and "all the things that could go wrong". However, she went on to say that it made her "more relaxed and think that [she] could do it". Participant 3 notes, "it made me feel a bit more anxious because I had to focus on my race and actually think about it". However, the participants gained the independent ability to accept the nervous emotions and make them facilitative rather than avoiding those feelings and letting them become debilitating. This was mentioned in the follow up interview, by the same participant when she said, "[the competition routine] was really helpful in focusing on the race". The increased self-

awareness of anxiety symptoms relating to competition performance is a positive change that supports Terry and Mayer's (1998) findings that mental training programs can create awareness of signs and symptoms of performance anxiety to facilitate a more positive experience. Participant 4 did not mention getting nervous, as she often felt excitement for her upcoming race.

***Excitement.*** For three of the participants, the competition routine did not bring on feelings of excitement towards their upcoming race. However, for Participant 4, she did not believe she got as nervous as her teammates for races. Participant 4's imagery script was more focused on being positive and getting excited, rather than overcoming nerves. She did not believe she used the self-talk portion of the competition routine as often as her imagery script. However, one of the self-talk cues she did use helped remind her of something an old coach used to say to her before races: "strong, fast, powerful", and she thought it helped her get more excited for her race.

***Preparation. Knowledge of ability.*** All participants believed the competition routine helped remind them of their ability to race, and swim well. Participant 1 thought the competition routine was helpful because it made her believe in herself and her abilities. The script in particular made her feel "confident and secure". Participant 2 used the competition routine and said that it made her feel good, confident and reminded her that she "could do it". To her, the competition routine gave her reassurance of her abilities, which she mentioned throughout her reflective questionnaires. Participant 3 also mentioned the competition routine's aid in believing in herself. She said it gave her more confidence and reminded her that she could do it. Participant 4 said the self-talk portion of her routine gave her more confidence.

**Readiness.** Participants 1, 3 and 4 talked about their competition routine making them feel ready to race. Participant 1 used the imagery script as a way to feel the race before it actually began. For Participant 3, the imagery script and the self-talk portion of the competition routine helped make her feel more ready for her race. Overall, Participant 3 felt the competition routine was helpful for her to prepare for her upcoming swim. She said in her follow-up interview, “[the self-talk] was really good in helping with the focus and be more ready”. Participant 4 said the self-talk portion made her feel “ready to go”.

**Technical strategy.** Out of the participants, 3 of them used the competition routine to remind them of what their technical strategy was while racing. Participant 2 found the self-talk section helpful during her actual swim. She thought that using the self-talk cue words during her race made her work harder in her swim. She explained how she enjoyed the personalization of her self-talk words, because if she felt down during a race, she knew she could use her self-talk cues to push her to go faster. Participant 2 said she would continue using her competition routine in the future because she felt like it helped her focus on what she needed to do in her race. Participant 3 thought that the self-talk cue words were helpful in reminding her what she wanted to do while she swam and what techniques she wanted to try to accomplish during her race. Participant 4 felt the imagery script was helpful in reminding her what she would like to accomplish while swimming.

### **Social Validity**

The follow-up interview with participants helped answer essential questions about the social validity of the competition routine intervention. Hrycaiko and Martin (1996) contend that assessing the utility of interventions should be made by asking three questions regarding social validity: 1) To what extent are the target behaviors important

to the participant. 2) Are the particular procedures used acceptable to the participants when other procedures could accomplish the same results? 3. Are the participants satisfied with the results?

Participant 1 thought it was helpful to personalize the scripts so they were tailored to her individual needs. She also enjoyed how the script was different than anything she had done in the past. Overall, Participant 1 thought the competition routine was helpful and a “good fit” for her individual needs. She also said she would continue using the competition routine since she felt as though it was working. She felt as though the primary researcher was helpful in delivering the intervention, especially when she needed help with phrasing in her imagery script.

Participant 2 liked the overall individuality of the competition routine but found it helpful to have a script for the imagery portion since she knew what she would be listening to. Similar to Participant 1, Participant 2 thought the primary researcher was helpful in brainstorming when she needed ideas. She especially liked that the researcher helped rewording certain things in the imagery script in order to make it more positive. There was nothing that Participant 2 would have liked to do differently with her intervention or her competition routine.

Participant 3 felt it was important to have her competition routine personalized for her. She thought it was helpful that the primary researcher set out guidelines for her to follow when they came up with it together. Again, Participant 3 did not think anything could have been done differently to make the intervention or the competition routine more successful.

Participant 4 would continue to use certain parts of the competition routine that she found to be most helpful for her. She thought she would continue using the imagery script and certain self-talk cues before she got in the water for her race. The participant thought it was important for her competition routine to be individualized because “everyone is different”, and it was designed specifically for her needs. Participant 4 did not think it would have been as effective to be given a specific competition routine. She mentioned that it was helpful to brainstorm ideas with the primary researcher and did not think there was anything that should have been done differently to make the intervention or competition routine more effective.



## **Chapter V: Discussion**

The aim of the study was to evaluate the effects of a competition routine intervention on participants' cognitive and somatic anxiety, self-confidence and performance. Although the CSAI-2C results did not show powerful changes in trends post-intervention, reflective questionnaire and follow-up interview results provided support that participants perceived a positive change in all dependant variables through the use of their competition routine. Through these changes, two of the innate psychological needs described in the self-determination theory were fulfilled in order to maintain intrinsic motivation and promote well-being in competition contexts. This study also provided further support of the perceived benefits of competition routine use by youth athletes, as there is very little research done on the subject (Mamassis & Doganis, 2004). Furthermore, the participants became more self-aware of their levels of state anxiety and self-confidence leading up to competition, providing more support for the importance of finding the individual zone of optimal functioning.

According to the IZOF model, each individual's zone of optimal functioning is different (Jokela & Hanin, 1999). It can be found by using the athletes' state anxiety score at previous best performances and adding to, or subtracting points from that score (Salminen et al., 1995). An athletes' previous best performance state anxiety score can vary immensely across individuals, depending on what level of anxiety produces their optimal performance (Salminen et al., 1995). Although cognitive state anxiety scores remained relatively stable for participants, somatic anxiety levels changed between baseline and post-intervention phases for all participants. This resulted in both positive and negative performance outcomes, based on the IZOF model.

Participant 4 was extremely low in both cognitive and somatic anxiety variables in comparison with the other participants and the population norms. Her self-confidence variable was also extremely high. Participant 4's zone was obviously much different than other individuals in the study and that was why tailoring the interventions to each participant was crucial. Since this participant was already showing signs of being in her zone of optimal functioning, consistently throughout the baseline phase, it is possible that the intervention actually did the opposite of what was intended. This showed in the Participant's performance results when her mean swim time was actually slower and her cognitive anxiety scores showed more variability after a relatively stable baseline phase.

Participant 1 showed an increase in her cognitive anxiety trendline following her intervention. Her first swim was her fastest swim time in the entire study. This occurred during the baseline phase where she scored an 11 in cognitive anxiety and 12.5 in somatic anxiety, respectively her second highest cognitive and highest somatic anxiety scores in the study. Although the participant's cognitive anxiety scores varied throughout the post-intervention phase, they were often close to the same level as when she swam her fastest time in the study. Her somatic scores decreased, never to reach the same level of anxiety as that first race. Participant 1 had the most time trials out of all the participants, with only three real races during the study. It is possible that although she felt more confident by the end of the study, her lack of anxiety (usually caused by the event being a time trial), may have impeded the participant from reaching her zone of optimal functioning, thus resulting in slower swim times.

Participant 4's somatic anxiety scores showed stability following her baseline phase and this might have been unhelpful if she needed a slightly higher somatic anxiety

level to compete well. Additionally, Participant 2 had a dramatic decrease in her somatic anxiety post-intervention and both participants mentioned using the deep-breathing technique to calm themselves before the race. Retrospectively, it may have been helpful to change the relaxation technique. Even by using it earlier on in the competition routine, it might have allowed Participants 2 and 4 to increase their somatic anxiety closer to competition, bringing them to their individual zone of optimal functioning. Participant 3's zone of optimal functioning was different in that her somatic anxiety increased dramatically in the post-intervention phase, also showing to be higher than the population norm. However, her mean swim performance time showed a three second drop from her baseline phase. Although Participant 3 used the deep-breathing to physically calm herself before swimming, her general increase in somatic anxiety in combination with her variability in cognitive anxiety may have pushed her into her appropriate individual zone of optimal functioning in order to produce better results.

As there were four dependant variables, interventions took place when one variable on the CSAI-2C showed a neutral or declining trend in the opposite direction of which the hypothesized trend would go. This approach sometimes left other dependant variables showing a different trend during baseline. To compensate, the reflective questionnaires and follow-up interviews were undertaken to reveal what was not always seen in the CSAI-2C data analysis. Results showed how even a small change in data post-intervention can be perceived as noteworthy to the participant (e.g. Participant 2 noting a positive increase in her self-confidence in every reflective questionnaire, yet only showing a slight increase in CSAI-2C data). Furthermore, through induction of the

follow-up data, two themes emerged that corresponded with the theoretical framework used to design the intervention approach.

According to research, it is sufficient to conduct a single-subject, multiple baseline study with only three participants (Barker et al., 2011). The reasons for having a small sample size were numerous. Firstly, it is difficult to conduct a detailed mental skills intervention program with a large group of participants. Secondly, the importance of individualizing the competition routine related back to the theoretical foundation of the study, therefore requiring time spent with each individual participant. This is not feasible with a large sample size. Although participant 5 was unable to finish the study due to injury, in this particular study the small participant sample provided an appropriate size to look at a personalized intervention approach to competition routines. Although the findings cannot be generalized to a larger population, this type of research is necessary to be able to look at personalized interventions in more depth.

The theme of Mental Skills Training was found to link back to the psychological need of Autonomy under the Self-determination theory. The sub-themes under Mental Skills Training were all cognitive strategies used to control the emotions associated with competing. For example, Participant 4 found the competition routine “made me feel excited for my race”. The participant was able to fulfill her psychological need of autonomy by using her competition routine to feel more in control of the situation. She also used her routine to elevate her arousal in order to facilitate her performance in the water. Participant 4 perceived herself to be able to use her competition routine to elevate arousal in order to optimize her performance, which supported the Individual Zone of Optimal Functioning (Jokela & Hanin, 1999). The other participants sometimes struggled

with the positive association between competition anxiety and elevated performance.

However, Participants 1, 2, and 3 all showed growth in their positive perception of competition anxiety towards the end of the study. It is imperative that the participants see the challenges of competition in a positive light, as competitions are prevalent in the early specialization trajectory.

The theme of Preparation was found to relate back to the psychological need of Competence. The sub-themes were based on the participant achieving feelings of being prepared to swim their event through the use of their competition routine. This was seen by Participant 3, when she mentioned that the competition routine “made me feel more confident because it reminded me how to swim the race and that I could do it”. Through the competition routine intervention, participants learned mental skills that can be used throughout their sporting career. As these participants had little to no sport psychology background previous to this study, learning three new mental skills and putting them into a routine format provided a feeling of competency. As the study progressed, the participants’ proficiency of each mental skill increased with usage throughout the study according to description provided in their reflection questionnaires of their skill usage. Through the intervention, participants became more self-aware of when to use each mental skill in their competition routine. Since competition anxiety is common in the early specialization trajectory, it is beneficial for them to learn these mental skills early (Wiersma, 2000). These mental skills are also transferable, and can be used in different sports and competition contexts. Participant 1 said she tried her competition routine at a dance competition after receiving her intervention.

The relatedness need was found in the data through participants' lack of connectivity with others in their social context. Participants often talked about using their competition routines to focus more on what they were doing rather than being distracted by other competitors. This is important to note because the athletes did not want to feel this connection with their peers, as they were seeing them as competition and a source of anxiety. Instead they used their competition routines, more specifically their imagery scripts, to focus on their own race and not the people swimming beside them. Although the Self-Determination Theory finds that connections with others fulfills one of the basic psychological needs, participants were actually using their competition routine to focus on themselves and close off those connections in order to perform.

The interview results found relating back to the self-determination theory are in line with the theory's goals of investigating "people's inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration, as well as for the conditions that foster these positive processes" (Ryan & Deci, 2000). By providing the participants with ways to cope and respond to competition anxiety, the competition routine helped facilitate that state anxiety. This is important because continual stress that is associated with participation in competitive sport can lead to burnout or withdrawal (Bartholomew, Ntoumanis & Thøgersen-Ntoumani, 2011; Wiersma, 2000). Since participants became more self-aware of their anxiety levels associated with competing, it would be beneficial to them in future if they found what exact order and usage of each mental skill in their competition routine brought them to their individual zone of optimal functioning. Through the positive perceptions of the participants, the intervention was successful in providing a more positive competition

experience, which research shows can lead to lifelong participation in sport (Wiersma, 2000). The competition routine also gave participants the ability to fulfill two of their three psychological needs in order to provide the conditions necessary to engage in positive self-motivation in a competitive situation.

In the follow up interviews, participants all had positive opinions about making the competition routine as individualized as possible. This was done purposefully to make the development of the competition routine an autonomous experience for the participants, in order to reproduce a competent and autonomous experience while using it at competitions. The imagery section was made through collaboration between researcher and participant. Participants all agreed that this effort to make the script individualized was very helpful for them. The self-talk section of the competition routine was also autonomous in that once the participants understood the concept of positive self-talk, they were allowed to come up with self-talk cue words or phrases themselves, with help from the researcher if necessary. Although the deep-breathing technique was not individually tailored to each participant, by making sure that participants had the ability to use it effectively gave them a sense of competence over that mental skill. Participant 2 enjoyed the control over when to use the deep-breathing technique, because as she said, “not everyone gets nervous at the same time. So then, you used it when you were nervous”.

Allowing the participants the freedom to make decisions (within study limits) regarding their competition routine, such as when to use each mental skill and how to use each technique, gave them an autonomous sense of control over the situation and the mental skills they would be using in competition. With two of the psychological needs

fulfilled, the competition routine helped provide conditions to elicit a sense of intrinsic motivation towards competing.



## **Chapter VI: Limitations and Future Directions**

There were several limitations that were found throughout the study. The first being the limited number of swim meets in which the swimmers participated. The hypothesis measured the dependant variables of self-confidence, anxiety and performance in competition settings, however it was extremely difficult to obtain a sufficient amount of CSAI-2C data through strictly competitions. This was due to the swimmers only competing approximately once per month. Therefore, the use of time trials during practice became necessary. Although the coach tried to simulate a competition scenario as close as possible, it was still not quite the same experience for the participants and this could explain the lack of anxiety during time trials, and an increase in anxiety at real meets. Participant 1 even described this issue in a reflective questionnaire, “I just did not have the same feeling as I do at meets”. As this was applied research, having only 3-6 competition data points presented a limitation to the quality of the data collected.

Due to the lack of swim meets, and the amount of time trials necessary, the study took place over a four-month period, which became a limitation as well. The researcher and coach determined the length of the study. The coach believed that in order to re-create the feeling of a competition as much as possible, having more than one time trial per week would be a mistake. This was taken into consideration, however the length of the study may have affected the consistency of the competition routine being performed by the swimmer. In order to keep participants engaged in practicing their competition routine consistently between uses at time trials and races, it could have been favorable to hold biweekly booster sessions. These would have helped participants go through each section, in case they forgot an aspect of it. Also, since each competition routine was

personalized, this could have also acted as an opportunity to alter certain mental skills if the participants thought that they were not working for them.

Another challenge during the study was participants were sometimes unable to take part in races or time trials due to injury or illness. This led to Participant 2 and Participant 3 having their intervention take place following 4 data points. Since the data analysis was based on the setup of the design (i.e. participants showing an effect after individual treatment times throughout the study) it was difficult to maintain appropriate design standards with these changes.

Reflection questionnaire and follow-up interview data may have presented a limitation with the social desirability of youth participants. Through informed consent and participant assent, measures were taken in order to eliminate the position of power and any bias on the participants. During the follow-up interviews there was a third party interviewer and the reflection and interview questions were presented in a neutral tone. However, there is still a possibility of participants answering the questions in a way to 'please' the researcher. Since the participants were willing to criticize what they thought was not good about the study (e.g., Participant 1 saying that she did not feel as anxious at time trials, since they were not real competitions), it helps justify the perceived positive effects the intervention had. Participants also talked about how each mental skill made them feel during their competition routine. They were asked to describe these things through the use of open-ended questions, both on the reflection questionnaire and in the follow-up interview. Participants used their own words to describe how each part of their competition routine made them feel, leading to data that captured their perceived experiences.

Another limitation that was faced was participants were supposed to complete the CSAI-2C before their swim event, but after they had completed the competition routine. However, the participants sometimes did parts of the routine while on the blocks or even during the swim, “I used my [self-talk] during my race”. This was necessary in order to maintain the autonomous quality of the competition routine. For participants to have control over when and where they did their routine, sometimes it made more sense for them to use certain techniques during their actual race. This was resolved by the reflective questionnaire in that the participants were able to explain when they used each technique in their competition routine.

Due to these numerous limitations, it was helpful to collect reflective questionnaire and follow-up interview data. Although the CSAI-2C results weren't as significant as hypothesized, the participants all perceived a significant change in their anxiety, self-confidence and performance. Participants also became more self-aware of their zone of optimal functioning through state anxiety levels.

### **Recommendations**

The reflection questionnaire and follow-up interview results from this study showed a perceived enhancement in self-confidence and decrease in competition anxiety with the use of a competition routine. However, the CSAI-2C results did not show a consistent, significant improvement in any of these areas. With this in mind, it is strongly recommended that future studies be done on the use of competition routine with junior athletes, while keeping the limitations in sight. Since the use of competition routines by adult athletes have been linked to improvement in performance (Patrick & Hrycaiko, 1998; Cohn et al., 1990; Kendall et al., 1990), it is still believed that this could be

beneficial for young athletes competing at high levels. Mamassis and Doganis (2004) showed the potential benefits of a mental training program through their work with youth tennis players. However, their intervention lasted 25 weeks, was extremely detailed and the study continued over an entire season. The competition routines used by their participants produced significant, positive results in both competition performance and self-confidence. Clearly, this type of sport psychology work is effective with young athletes. Therefore, future replications of this research should be done with a more time-sensitive delivery method of the competition routine intervention. For example, if the study was done over a shorter period of time with more competitions timed closer together and doing more time trials per week if necessary.

Additionally, it is recommended to continue studying the potential benefits of a mental skills package with youth athletes, in a format that would allow athletes to use the routine more consistently, in different situations (e.g. every swim event they participate in). It was difficult to measure the effectiveness of a competition routine that was only used once every week or two throughout the study, and before only one specific event. It is believed that the benefits of the competition routine could have been seen more clearly with more consistent usage. This would also take into account the potential learning curve of participants participating in a mental skills program for the first time. Although there was fewer data points, the importance of the participants having autonomy over when and how they could use their competition routine in each situation was evident. The participants appreciated the ability to control these features of the competition routine and that was reiterated in the reflection questionnaire and follow-up interview data.

Another recommendation based on the IZOF model is that participants should be tested for their optimal zone of functioning before beginning the study, based on recalling their state anxiety levels pre-competition from their most successful performance. As it has been shown in past research that this method of recollection is quite accurate, it would be helpful to find where the athletes are at in their baseline and design their competition routines to appropriately bring them into their individual zones. As individuals vary in zone levels, this could provide a more accurate interpretation of results for participants. For example, those participants who may actually need to elevate their state anxiety scores in order to produce better performance results would not be seen as having a negative outcome when their anxiety increases. This continued self-awareness should also increase participants' feelings of autonomy in the competition setting.

The follow-up interviews in this study produced strong correlations between competition routines and the fulfillment of two of the three innate psychological needs, autonomy and competence. However, fulfillment of the relatedness need was not met according to the SDT, due to the individuality of the intervention process. Since continuation in sport is linked to psychological need satisfaction in all three areas (Joesaar, Hein & Hagger, 2011), a future replication of this study should be done with the goal of fulfilling all three innate psychological needs. It was clear from participant responses that focusing on themselves and their individual needs were a priority during their competition routine. However, providing a relatedness-supported environment for the intervention process may be essential in satisfying that third psychological need. Additionally, research suggests that task-involving peer climates have significant and

positive effects on psychological need satisfaction (Joesaar et al., 2011). Since ‘Focusing on the Task’ came up as a theme in the follow-up interview data, the research suggests it is beneficial to design an intervention within a peer supported, task-focused climate (Joesaar et al., 2011).

One area of research that has been gaining popularity in youth sport is the idea of competitive engineering (CE). This research supports modifying structure, rules, equipment and facilities in order to produce a more autonomy supportive climate (Burton, Gillham & Hammermeister, 2011). A future direction in early specialization sports is introducing competitive engineering in order to create a more positive competitive climate for youth athletes. This, in combination with mental skill development at a young age, would elevate intrinsic motivation, providing a more positive sport experience leading to well-being and future enjoyment in sport into a later age.

Participants in this study came from the sport of swimming, however it is difficult to relay the overall effects on an athletic population without study on a larger variety of athletes. Athletes in a variety of early-specialization sports encounter different competition scenarios, and it is important to look at more than one population of athletes in order to determine if results could be generalized across sports.

## **Conclusion**

Overall, the findings of this study were beneficial in describing the positive effects of a competition routine intervention on youth swimmers. The participants perceived an improvement in their anxiety, self-confidence and swim performance through their competition routine training. Since the swimmers were subjected to a high

amount of stress at their competition level, it was beneficial to be taught mental skills to help cope with their anxiety. It is important to note that all participants found it helpful to have their competition routine personalized to their needs. This individual style of intervention created competition routines that were capable of fulfilling the autonomous and competence needs of the participants in order to create a more positive competitive experience. The experience also left participants more self-aware of their mental skills usage and how to create facilitative arousal levels in competition contexts. This research has important implications for future interventions aimed at youth and competition routine development. Future studies should be undertaken with youth involved in other early specialization sports, as well as group interventions. Additionally, research in competition routine interventions for youth should aim to further assess all three psychological needs of the self-determination theory.

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## Faculty of Kinesiology and Recreation Management

### Appendix A

#### Informed Consent

**Research Project Title:** The effects of a competition routine intervention on youth swimmers competition anxiety, confidence and performance.

**Researchers:** Kristin Davies, Primary Researcher, Faculty of Kinesiology and Recreation Management, Supervising Advisors: Dr. Leisha Strachan and Dr. Melanie Gregg.

**This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.**

The purpose of this study is to explore the effects of a competition routine intervention on anxiety, confidence and performance at swim meets. Results will serve to provide information about the use of competition routines with youth high performance athletes. It is important to find out more about what coping methods are valuable for elite youth athletes in competition settings. This has the potential to help improve competition routine interventions with other youth athletes. The athlete will be asked to complete the Competitive State Anxiety Inventory-2C (CSAI-2C) before one swim event per competition throughout the duration of this research. The CSAI-2C takes approximately 5 minutes to complete. After a minimum of three competitions, each participant will be involved in an intervention where they will learn a competition routine involving imagery, positive self-talk and a deep breathing relaxation technique. The participants will also be asked to fill out a reflection questionnaire after their race is complete, once

the intervention has taken place. The results of the study may be used in thesis research, published in academic journals and presented at conferences or workshops.

This research study is guided by the following question:

1) Can competition routines reduce competition state anxiety, enhance confidence and enhance sport performance for junior elite swimmers?

Participation in this study during the fall of 2011 will involve:

-4 x 30 minute intervention sessions with the primary researcher in order to learn the competition routine.

-The completion of the CSAI-2C questionnaire before one specific race per competition as decided upon by the athlete and primary researcher. The CSAI-2C questionnaire takes approximately 5 minutes to fill out.

-The completion of reflective questions after the completion of the same swim race in each competition. This should take approximately 5-10 minutes.

Information provided to the primary researcher and supervising advisors (Kristin Davies, Dr. Leisha Strachan and Dr. Melanie Gregg) will not be discussed or disclosed to any other individual. The data obtained during the course of this study will be stored in a secure location (e.g., locked file cabinet in room 119 Frank Kennedy Center, password equipped data files) that will only be accessible to the principal researcher. The results of the study may be used in thesis research, published in academic journals and presented at conferences or workshops. Names will not be associated with any of the surveys and the identities of those who participated in the study will be protected in any presentation or publication. Any identifiable information given by participants will be removed or changed in order to keep their identity safe. Any quotations from the study used in future presentations will have all names and/or identifiable traits removed. All data pertaining to the study will be shredded after a five-year period.

There are no known physical, psychological, economic, or social risks associated with participation in this study. You may refuse to answer any questions. You may withdraw from the study by contacting the primary researcher (Kristin Davies). Refusal to participate or withdrawal from this study will have no consequences whatsoever. Any data relating to individuals who withdraw from the study will be shredded.

This study is being completed as thesis research in accordance with the University of Manitoba. Dr. Leisha Strachan and Dr. Melanie Gregg are the supervising advisors for this research and can be contacted at [strachal@cc.umanitoba.ca](mailto:strachal@cc.umanitoba.ca) or [m.gregg@uwinnipeg.ca](mailto:m.gregg@uwinnipeg.ca).

**Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or**

**consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.**

**To be sent a summary of the results of this study in the next 3 months, please write your name and address:**

**Participant Name:** \_\_\_\_\_

**Participant Address:**

\_\_\_\_\_  
\_\_\_\_\_

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Coach's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Principal Researcher's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Principal Researcher:

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**This research has been approved by the Education/Nursing Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above named persons or the ENREB Human Ethics Coordinator, Margaret Bowman, at [margaret\\_bowman@umanitoba.ca](mailto:margaret_bowman@umanitoba.ca) or 474-7122.**





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## Appendix B

### Participant Assent



**Research Project Title:** The effects of a competition routine intervention on competition anxiety, confidence and performance.

**Researchers:** Kristin Davies, Primary Researcher, Faculty of Kinesiology and Recreation Management, Supervising Advisors: Dr. Leisha Strachan and Dr. Melanie Gregg.

**This letter will give you an idea about what I am researching and how you can help. If you have any questions, please ask me! Read this letter carefully...**

I am doing a study about how the use of a competition routine can make swimmers feel more confident and less anxious before they race. Competition routines are a combination of mental skills that can be used right before an athlete competes; things like imagery, self-talk and deep-breathing. I am hoping to have a lot of help from you in this study. The results will help to learn more about how competition routines can be used for young athletes to help them feel better when they compete.

**There are 3 steps to this study:**

- 1) You will be asked to complete a questionnaire asking you about your feelings of confidence and anxiety before a few different swim races and/or time trials. This questionnaire takes approximately 5 minutes to complete.
- 2) After a few races, you will learn the competition routine, which includes imagery, positive self-talk and a deep-breathing technique. You will then continue filling out the same questionnaire to see if the competition routine helps you feel less anxious and more confident before you race.



- 3) Once you have learned the competition routine, you will also be asked to fill out some quick reflection questions after you finish racing, to learn more about how you feel.

I want you to know that I will not be telling your coach, parents, or any other kids what you say or write. Only the researcher and supervisors will be able to get into any of the information you provide to me. A report will be put together and may be presented or published in a journal. No one will know who the kids are that are in my study.

Your mom, dad, and/or guardian have said it's OK for you to be in this study. Would you like to help? You won't get into any trouble if you say 'no'. If you start the study then decide you don't want to do it anymore, that's OK too! You can ask questions at any time, now or later.

If you would like to help, please sign your name on the line below:

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Principal Researcher:

Kristin Davies  
Graduate Student  
Faculty of Kinesiology and Recreation Management  
University of Manitoba  
Phone: (204) 880-3068  
[umdavi56@cc.umanitoba.ca](mailto:umdavi56@cc.umanitoba.ca)



This research has been approved by the Education/Nursing Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above named persons or the ENREB Human Ethics Coordinator, Margaret Bowman, at [margaret\\_bowman@umanitoba.ca](mailto:margaret_bowman@umanitoba.ca) or 474-7122.

## Appendix C

Competitive State Anxiety Inventory – 2  
Children's Form A (CSAI-2C)

Name: \_\_\_\_\_ Age (years): \_\_\_\_\_  
 Check one: Boy \_\_\_\_\_ Girl \_\_\_\_\_

**Directions:** Below are some statements about how boys and girls feel when they play games or participate in sports and physical activities, like swimming. Please read each statement, then circle the appropriate number to the right of the statement to indicate how you feel right now – at this moment. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which best describes your feelings right now. If you do not understand any statement or word, CIRCLE that statement or word, THEN ask the tester for an explanation.

		Not at all	Somewhat	Moderately so	Very much so
W1	I am concerned that I may not swim as well as I can today	1	2	3	4
S2	My body feels tense	1	2	3	4
C3	I feel self-confident	1	2	3	4
S4	I feel tense in my stomach	1	2	3	4
C5	I feel secure	1	2	3	4
C6	I'm confident that I can meet the challenge of swimming well today	1	2	3	4
W7	I'm concerned that I will swim poorly today	1	2	3	4
S8	My heart is racing	1	2	3	4
C9	I'm confident that I will swim well today	1	2	3	4
W10	I'm worried about reaching my swimming goal	1	2	3	4
S11	I feel my stomach sinking	1	2	3	4
W12	I'm concerned that others will be disappointed with my swimming performance	1	2	3	4
C13	I'm confident because, in my mind, I picture myself reaching my goal	1	2	3	4
W14	I'm concerned about not being able to concentrate today	1	2	3	4
S15	My body feels tight	1	2	3	4

Appendix D

**Reflection Questionnaire**

- 1) How did I use each mental skill in my routine before my event?
  
  
  
  
  
  
  
  
  
  
- 2) How did the routine make me feel before my event?
  
  
  
  
  
  
  
  
  
  
2. a) Did the competition routine make me feel more or less confident?
  
  
  
  
  
  
  
  
  
  
2. b) Did the competition routine make me feel more or less anxious?

## Appendix E

Follow up interview questions:

1. What did you think about the imagery script portion of your competition routine? What did you think about making the script your own individual script specific for your race? Did you like the way you came up with the script, why or why not?
2. What did you think about the self-talk section of the intervention? What did you think about making the self-talk cue words/sentences your own? Did you like the way you came up with the self-talk words, why or why not?
3. What did you think about the deep-breathing section of the intervention? What did you think about having a choice of when to use the deep-breathing technique?
4. Overall, what did you think about coming up with your competition routine?
5. Is it something that you will continue to use in the future, why or why not?
6. **Probe:** (Did you like having a script more, or being able to choose your own stuff more?)
7. **Probe:** (If you could do the competition routine again, would you rather come up with it totally on your own, or have something given to you?)
8. What did you think about the way Kristin helped you make the competition routine? What did you like, what did you dislike?
9. Do you think Kristin could have done anything differently to make the intervention better? What about the competition routine?

## Appendix F

**Procedural Checklists**

## Imagery Session:

- Introduce participant to imagery.
- Explain what Motivational-General Mastery imagery is and how it works.
- Collaborate with participant in developing a Motivational-General Mastery imagery script that is tailored to their swim event.
- Record the script and email it to participant in order for them to put it on their personal music device.

## Self-talk Session:

- Introduce participant to self-talk.
- Explain what self-talk is and how it works.
- Collaborate with participant in developing a set of cue words that can be used as positive self-talk during their competition routine.

## Centered Deep Breathing Session:

- Introduce participant to the centered deep breathing technique.
- Explain what centered deep breathing is and how it works.
- Collaborate with participant in following the centered deep breathing exercise so that it will be most effective before their swim event.
- Create section of competition routine.

## Competition Routine Session

- Review each mental skill from prior sessions.
- Combine them all to create the participant's competition routine.
- Practice the competition routine twice.