THE EFFECTS OF A MENTAL IMAGERY WORKSHOP ON COACHES’ ENCOURAGEMENT OF IMAGERY USE

by

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Abstract

Recreational athletes are encouraged to use mental imagery by their coaches less frequently than elite athletes (Jedlic, Hall, Munroe-Chandler, & Hall, 2007). The purpose of this study was to examine whether a mental imagery workshop would increase recreational level coaches’ encouragement of imagery to their athletes when compared to coaches attending a communication workshop. The workshops provided coaches with imagery or communication information and tools as well as role-playing opportunities. Recreational sport coaches \((N = 132; M \text{ age } = 41.80 \text{ years, } SD = 9.67)\) completed the Coaches Encouragement of Athletes Imagery Use Questionnaire (CEAIUQ; Jedlic et al.), Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004), and questionnaires assessing coaches’ demographics, confidence, knowledge, and attitudes towards imagery. These questionnaires were completed before the workshop and online four weeks later. Repeated measure MANCOVAs, controlling for sex and highest level coached, were performed comparing the coaches’ encouragement of imagery use, as well as their confidence, attitudes, and knowledge of mental imagery, across the two study groups. No group by time interactions were found for any of the five functions of imagery. However, group by time interactions were found for knowledge \((F_{(1,132)} = 5.45, p = .02, \eta^2_p = .040)\), attitudes \((F_{(1,132)} = 4.45, p = .01, \eta^2_p = .055)\) and confidence \((F_{(1,132)} = 7.10, p = .04, \eta^2_p = .032)\) towards imagery. Paired-samples t-tests demonstrated that the mental imagery group significantly increased their confidence from baseline to follow-up \((t_{(65)} = -2.75, p = .01)\). Findings provide direction for designing future coach education training programs and aid in understanding recreational sport coaches’ views on encouraging their athletes to use imagery.
Key Words: mental imagery, coach training programs, mental imagery workshop, recreational athletes
Co-Authorship

This thesis presents the original work of Jaymi Edwards in collaboration with her advisors, Dr. Barbi Law and Dr. Amy Latimer.
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Table of Contents

THE EFFECTS OF A MENTAL IMAGERY WORKSHOP ON COACHES’ ENCOURAGEMENT OF IMAGERY USE................................................................. i

Abstract.................................................................................................................................................................................. ii

Co-Authorship.......................................................................................................................................................................... iv

Acknowledgements...................................................................................................................................................................... v

Table of Contents...................................................................................................................................................................... viii

List of Tables.............................................................................................................................................................................. x

List of Figures............................................................................................................................................................................. xi

Chapter 1 Introduction.................................................................................................................................................................. 1

1.1 Overview............................................................................................................................................................................. 1
1.2 Primary Objectives and Hypothesis............................................................................................................................... 2
1.3 Thesis Organization............................................................................................................................................................ 3

Chapter 2 Literature Review......................................................................................................................................................... 4

2.1 Mental Imagery................................................................................................................................................................. 4
2.2 Applied Model of Mental Imagery in Sport...................................................................................................................... 5
  2.21 The sport situation......................................................................................................................................................... 5
2.22 The functions of imagery............................................................................................................................................. 6
2.23 The desired outcomes.................................................................................................................................................. 7
2.24 The athlete’s imagery ability....................................................................................................................................... 8
2.3 Other Important Components to Consider When Using Imagery................................................................................. 9
2.4 Athlete Skill Level and Use of Imagery.......................................................................................................................... 11
2.5 Imagery Training Programs............................................................................................................................................... 13
2.6 Coaches’ Influence on Athletes.................................................................................................................................... 15
2.7 Coaches’ Encouragement of Mental Imagery................................................................................................................... 16
2.8 Coach Education Programs........................................................................................................................................... 18
2.9 Workshops Approach....................................................................................................................................................... 21
3.0 Factors Affecting Whether Coaches Encourage Imagery............................................................................................... 21
3.1 Summary............................................................................................................................................................................ 23
3.2 Study Purpose................................................................................................................................................................. 23
3.3 Hypothesis....................................................................................................................................................................... 24

Chapter 3 Manuscript................................................................................................................................................................. 26

Chapter 4 Communication Results............................................................................................................................................ 58
List of Tables

Table 1. Means, standard deviations, and reliabilities for each subscale of the Coaches’ Encouragement of Athletes’ Imagery Use Questionnaire, and knowledge, attitudes, and confidence questionnaires for pre and post workshop ..............................................58
Table 2. Coach demographic information by age and sex ..................................................59
Table 3. Means and standard deviations for each subscale of the Coaches’ Encouragement of Athletes’ Imagery Use Questionnaire, separated by groups for pre and post workshop ..........................................................................................................60
Table 4. Means and standard deviations for each where/when factor of the Coaches’ Encouragement of Athletes’ Imagery Use Questionnaire, separated by groups for pre and post workshop ...........................................................................................................61
Table 5. Pre and post means and standard deviations for coaches’ knowledge, attitudes, and confidence of using imagery for the control and mental imagery group ..................................................................................................................62
Table 6. Bivariate correlations between the functions of imagery and coaches’ confidence, knowledge, and attitudes towards encouraging their athletes to use imagery ..................................................................................................................63
Table 7. Pre and post means and standard deviations for Coach-Athlete Relationship Questionnaire ........................................................................................................................................64
Table 8. Pre and post means and standard deviations for coaches’ knowledge, attitudes, and confidence of improving communication for the control and mental imagery group ......................................................................................................65
List of Figures

Figure 1. *Coaches’ response to why they thought encouraging imagery with recreational athletes was or was not important*………………………………………………………………………………..57
Chapter 1 Introduction

1.1 Overview

Mental imagery is the most commonly used and studied psychological strategy in sport (Morris, Spittle, & Watt, 2005). There are many benefits to using imagery in sport, such as increased skill development and increased ability to control cognitions (Callow, Hardy, & Hall, 2001; Calmels, Berthoumieux, & d’Arripe-Longueville, 2004; Martin & Hall, 1995). However, imagery is used most frequently by competitive athletes (Cumming & Hall, 2002; Hall, 2001; Watt, Spittle, Jaakkola, & Morris, 2008). Other less competitive athletes may never receive the full range of benefits of using this psychological skill due to lack of knowledge and encouragement from their coach (Cumming & Hall). It is important to teach recreational athletes as well as competitive athletes about mental imagery because it can be beneficial not only to their sport performance but other areas of their life (Gould & Carson, 2008).

In order to teach these beneficial skills, a variety of psychological training programs tailored to athletes have been created. The main goal of these programs is to increase athletes’ use of psychological skills, with mental imagery being one of the primary skills being taught (Bull, 1991). However, often athletes perceive that they do not have enough time to go to training programs and therefore do not adhere to training programs (Bull). An alternative to teaching athletes and avoiding their concerns with time constraints is to work with coaches. For example, in a study by Hall and Rodgers (1989), figure skating coaches participated in an extensive mental skills program. Their athletes reported significant increases in using psychological skills after their coaches’ training. However, conducting these types of intensive training programs with coaches is not
always feasible. It may be that a single workshop aimed at teaching mental imagery to coaches also could be beneficial for altering their perceptions of imagery and increasing how frequently they advocate imagery to the athletes they coach.

Therefore the purpose of this study was to determine if a single interactive workshop aimed at teaching recreational level sport team coaches about mental imagery would be effective in increasing their perceptions of the amount that they encourage their athletes to use imagery. The workshop provided coaches with tools to teach and promote imagery use among their athletes.

1.2 Primary Objective and Hypothesis

Despite the benefits of imagery, recreational athletes use imagery significantly less than elite athletes (Cumming & Hall, 2002). This may partially be due to the fact that coaches at the recreational level promote imagery less frequently than coaches at higher competitive levels (Jedlic, Hall, Munroe-Chandler, & Hall, 2007). Therefore, the primary objective of this study was to examine whether an imagery workshop presented to coaches of recreational athletes would be effective for increasing coaches’ encouragement of mental imagery among their athletes to a higher degree than a control group receiving a communication workshop. The workshop gave coaches detailed information about imagery so that they could effectively encourage and teach all types of imagery to their athletes. Directly involving recreational level coaches in the learning process made this study unique.

Given that coaches provide minimal encouragement of imagery to recreational athletes and the benefits of coach education programs, the main hypothesis was that coaches who attended the mental imagery workshop would provide their athletes with
more encouragement to use imagery than those coaches who did not attend the mental imagery workshop.

1.3 Thesis Organization

This thesis conforms to the regulations outlined by the Queen’s School of Graduate Studies and Research. An in depth review of the literature is provided in Chapter 2. A manuscript, containing a summarized overview of the study and results is in Chapter 3. It is intended that this manuscript will be submitted for publication. Chapter 4 contains information regarding the communication aspect of this study. Finally, a general discussion is provided in Chapter 5. All references used are at the end of the document. The appendices provide copies of all material used to conduct this study.
Chapter 2 Literature Review

2.1 Mental Imagery

Mental imagery is the most widely used psychological strategy in sport for performance enhancement (Morris, Spittle, & Watt, 2005). It is often defined as “…an experience that mimics real experience. We can be aware of ‘seeing’ an image, feeling movements as an image, or experiencing an image of smell, tastes, or sounds without actually experiencing the real thing…It differs from dreams in that we are awake and conscious when we form an image” (White & Hardy, 1998, p. 389). Thus, imagery is a multisensory experience that occurs without performing any physical movement and occurs in the absence of the actual sensory and perceptual antecedents.

Many theories have been developed in an attempt to explain how imagery may enhance performance. There are cognitive and neurological-based theories, psychological state explanations, motor based-theories, and cardio-respiratory rationalizations to explain how imagery benefits performance. Decety and Grèzes (1999) provided evidence to show that certain areas of the brain show a pattern of activity during imagery that is similar to the pattern observed during performance. Cardio-respiratory research has shown that heart rate and breathing rate, factors that anticipate muscular activity, increase during imagery (Decety, Grèzes, Costes, Perani, Jeannerod, Procyk, Grassi, & Fazio, 1997). Also, cognitive research has demonstrated that physical practice and mental imagery share similar cognitive processes (Decety & Grèzes).

When considering how imagery works, athletes use imagery in a variety of ways not only to enhance physical aspects of their sport performance, but psychological aspects as well. Hall (2001) suggests that mental imagery can be an effective addition to physical
practice and is better than physical practice alone. Hall, Rodgers, and Barr (1990) determined that an imagery group had increased performance when compared to a control group not partaking in imagery or physical practice. Using imagery before a competition leads to enhanced performance in strength and muscular endurance events, as well as improvements in motor tasks (Vealey & Greenleaf, 2006). Imagery also has benefits for increasing self-confidence (Callow, Hardy, & Hall, 2001), motivation (Martin & Hall, 1995), and attentional control (Calmels, Berthoumieux, & d’Arripe-Longueville, 2004).

2.2 Applied Model of Mental Imagery in Sport

An Applied Model of Mental Imagery was created to represent how athletes use mental imagery in sport (Martin, Mortiz, & Hall, 1999). The components of the model were identified based on a thorough literature review of studies examining imagery use in sport. It was created to guide intervention studies and to be used in practical applications (Martin et al.). The model consists of four main components: 1) the sport situation, 2) the functions of imagery, 3) the desired outcome, and 4) the individual’s imagery ability.

2.2.1 The Sport Situation

The first component of the model, the sport situation, refers to when and where the athlete uses mental imagery. The majority of imagery research focuses on its use in practice situations; however, athletes tend to report using imagery more frequently in competitions (Barr & Hall, 1992). Competitive athletes also have reported using imagery outside of practice situations, such as at home or work and in injury rehabilitation (Salmon, Hall, & Haslam, 1994). Research has not examined extensively where recreational athletes most commonly use imagery.
2.2.2 The Functions of Imagery

The second component of the model is the function of imagery used. Paivio (1985) suggested that imagery serves either a cognitive or motivational function, and that these functions can operate at either a general or specific level. There are five imagery functions that have been identified in practice and competition situations: 1) cognitive general, 2) cognitive specific, 3) motivational general mastery, 4) motivational general arousal, and 5) motivational specific.

Cognitive general (CG) imagery involves imagery used to learn or improve strategies of play, game plans, or routines, whereas cognitive specific (CS) imagery involves using imagery to rehearse and learn skills (Paivio, 1985). For example, a basketball player may use CG imagery to rehearse specific offensive plays and aid in learning and remembering the plays. CS imagery could be used by that same player by visualizing the steps necessary to perform a basketball lay-up to help learn the skill.

Motivational general (MG) imagery is divided into two components, motivational general arousal imagery (MG-A) and motivational general mastery imagery (MG-M; Hall, Mack, Paivio, & Hausenblas, 1998). MG-A imagery is associated with controlling arousal and stress and MG-M is related to feeling in control, self confident, and mentally tough. An athlete could visualize being successful at a specific task repeatedly to boost his or her self confidence. Motivational specific (MS) imagery is the use of imagery to reach goals in sport, such as winning an event, receiving a trophy or medal or being congratulated by other athletes. MS imagery may boost motivation and effort during training and facilitate goal setting, but is unlikely on its own to lead directly to performance benefits (Hall et al.).
Research involving competitive athletes has found that the functions of imagery are not all used to the same degree. CS imagery is used most frequently, particularly in practices to aid in the learning of skills. In competitions, MG-M imagery is used most frequently to help athletes feel like they are capable of performing at specific levels and carrying out specific tasks (Martin et al., 1999). Hall et al. (1998) found that competitive athletes use all five functions of imagery more frequently than recreational athletes. Moreover, it is unclear how recreational athletes use all five functions of imagery. Recreational athletes may be encouraged to use different types of imagery than competitive athletes. It is also important to ensure the functions of imagery are understood by athletes and coaches so the correct type of imagery can be chosen in all situations.

2.2.3 The Desired Outcomes

The desired outcomes constitute the third component of the model. There are three outcomes associated with the functions of imagery; skill acquisition and improved performance of skills and strategies, modification of cognitions, and regulation of arousal and anxiety (Martin et al., 1999). An athlete should select the function of imagery used, based on his or her desired goal (Martin et al.). For example, if an athlete wanted to improve his or her confidence level, MG-M imagery would be used to modify his or her cognitions. If this athlete played forward in hockey he or she could visualize successfully scoring goals. By being successful repeatedly this feeling of mastery will be evident when the player steps back onto the ice. It is important to distinguish between the functions of imagery included in this model, and what the athletes are imagining (i.e., imagery content). Researchers have
suggested that what an athlete is imagining is not necessarily as important as focusing on why, when, and where they are using imagery (Munroe, Giacobbi, & Hall, 2000). What an athlete images can be individualized to suit his or her needs, suggesting there is not one specific image that should be created for each function. Athletes should be encouraged to create images that are meaningful to them and generate the thoughts and feelings they want to create. Thus, the focus should not be on what an athlete is imaging.

2.2.4 The Athlete’s Imagery Ability

The final component of the model is the athlete’s imagery ability. Imagery ability is defined by an athlete’s ability to create images that are vivid and controllable (Munroe et al., 2000). Vividness refers to ensuring the images are as real life as possible. This involves not only visualizing what is seen, but involving all senses into the image. Creating images that are controllable is also important. This ensures that the athletes are constantly on task while imaging and able to change their image in order to suit their needs (Munroe et al.). Controllability is also important for manipulating the image. As using imagery to visualize positive outcomes has been found to be more effective than imaging mistakes (Munroe et al.), it is important to ensure that the athletes can change their image if necessary to ensure it is positive in nature.

Imagery ability moderates the relationship between the function of imagery used and the desired outcome. If athletes are unable to imagine a desired image effectively and vividly in their mind, they will not experience positive benefits from using this skill (Martin et al., 1999). Isaac (1992) found that good imagers may have an advantage over those that are poor imagers in terms of sport performance and the learning of new skills.
Besides imagery ability, other factors may interact and affect this model. Researchers have suggested that other influential people, such as coaches, should be incorporated into this model (Jedlic et al., 2007). Coaches play an important role in teaching athletes the various uses of imagery and may aid in determining the function of imagery athletes need to use in order to obtain desired outcomes (Jedlic et al.). Without the coaches’ assistance, athletes who are unfamiliar or inexperienced with imagery may be unable to determine the correct function of imagery to use and thus may not achieve the full range of benefits of using imagery. These athletes may not understand what imagery is and are still developing their mental skills. Having a coach guide athletes step by step through an imagery session may ensure the athletes are constantly visualizing and focused on the task at hand. Also, the coach can enforce the importance and purpose of using imagery. The coach should understand how their athletes learn and comprehend new ideas. This understanding would help in determining the correct way to implement and encourage a new skill such as imagery to their team.

2.3 Other Important Components to Consider When Using Imagery

During an imagery session, various components should be considered, such as the perspective being used. An athlete can use either an internal or external perspective when imaging. Athletes who use an internal perspective image things as if seeing through their own eyes, whereas athletes who use an external perspective image things as if watching a television or movie (White & Hardy, 1998). White and Hardy suggest that task differences are responsible for different perspectives being used. For example, an external perspective may be more beneficial for the performance of skills that depend specifically on the physical execution (e.g., diving), whereas an internal perspective may be helpful
for open skills that depend on perception for their successful execution (e.g., playing team sports). Other research has demonstrated that imagery can also be effective if athletes switch between perspectives within the same imagery session (White & Hardy). It is important that an athlete understands these different aspects of imagery to ensure they are performing imagery correctly and to receive the greatest benefits from using it. Coaches should also be aware that neither perspective is necessarily better but both may be helpful in certain situations. Time must be taken to explain this to athletes so they are aware of both perspectives.

The effects of positive or negative valance of the image have also been examined. Indeed, positive and negative imagery differentially affects performance. Powell (1973) used a dart throwing task to show that positive imagery was more effective for skill learning than negative imagery. In fact, in a study by Woolfolk, Parrish, and Murphy (1985) negative imagery was found to be detrimental to performance. Undergraduate students who visualized themselves being unsuccessful in a golf putting task experienced performance deficits when physically performing the task. Once again, it may be important for athletes and coaches to understand the benefits associated with positive imagery in order to implement an imagery program effectively. For example, if coaches understand that positive imagery enhances performance and negative imagery hinders performance, they can ensure the focus is always on performing positive imagery.

Another aspect of imagery that athletes and coaches should understand is imagery modality. It refers to athletes’ abilities to see and feel movements. Visual imagery is the ability of athletes to see the actual movement, whereas kinesthetic imagery refers to athletes being able to feel the movement they are visualizing (Hall & Martin, 1997).
Researchers have found that kinesthetic is not used as often as it should be and is only used by competitive athletes (Hall & Erffmeyer, 1983; Nideffer, 1976). Mumford and Hall (1985) reported that kinesthetic imagery seems to improve as a function of physical skill level. For example, they noted that senior figure skaters seem to be better kinesthetic imagers than junior and novice skaters. Therefore it is important to ensure that coaches and athletes at all levels understand the importance of incorporating kinesthetic imagery into their training sessions. It is also essential that athletes use all of their senses and make imagery as similar to real life as possible (Munroe et al., 2000).

2.4 Athlete Skill Level and Use of Imagery

Athletes, especially at higher competitive levels, use imagery extensively (Hall, 2001). An operational definition of a competitive athlete is as an athlete competing at a varsity level, regional level or higher. Also competitive athletes partake in regular competition against others, are focused on excellence and achievement, and have regular training (Maron & Zipes, 2005). On the other hand, recreational athletes are not focused on excellence and achievement. Munroe and colleagues (2000) found that varsity and regional athletes use imagery most frequently to enhance their performance and aid in skill execution rather than skill learning. Competitive athletes have reported using more imagery in a typical week than recreational athletes (Cumming & Hall, 2002). Similarly, national, state, and district athletes report using more imagery than recreational athletes (Watt, Spittle, Jaakkola, & Morris, 2008).

However, strategies and approaches to teach psychological skills to competitive athletes may be appropriate for recreational athletes in sports as well. For example, Li-Wei, Qi-Wei, Orlick, and Zitzelsberger (1992) conducted a program that involved
recreational athletes visualizing themselves performing their shots in table tennis the best they possibly could. They demonstrated that a mental imagery training program improved the athletes’ accuracy and technical quality of their table tennis shots. Given these benefits, it seems that mental imagery should be taught to recreational athletes as well.

Athletes often take one of three paths when choosing to participate in sports; the sampling or specialization pathway (Côté, Baker, & Abernethy, 2003). In the first path, sampling, the athletes participate in a wide variety of sports at an early age and then later focus on a single sport with the hopes of reaching elite status. In the second path the athletes move from sampling to specializing in a single sport and focus solely on practicing and competing in that sport (Côté et al.). Finally, in the third pathway, athletes invest all of their resources into a single sport. Other athletes may just pursue a recreational pathway for their whole sport career. By incorporating imagery into athletes’ sport experience early on, athletes are provided with added time to learn these important psychological skills and to benefit from using them. Depending on the sport path they chose to pursue they could use the skills they learn in different manners (e.g., to improve future sport performance or to aid in assisting with other areas of their life).

Mental skills can be taught to recreational athletes to benefit not only their sport performance but all aspects of their life. These transferable skills are often referred to as life skills. Life skills have been defined as, “those internal personal assets, characteristics and skills such as goal setting, emotional control, self-esteem, and hard work ethic that can be facilitated or developed in sport and are transferred for use in non-sport settings” (Gould & Carson, 2008, p.353). Many of the skills learned in sport, such as performing
under pressure, handling success and failure, and solving problems, are transferable to other life domains (Danish, Petitpas, & Hale, 1992).

Mental imagery can be seen as a strategy to aid in the formation of these life skills because it is used to improve such factors as an athlete’s emotional control and self-esteem. (Callow, Hardy, & Hall, 2001; Martin & Hall, 1995). Athletes who learn these skills may be more likely to apply them to other areas of their life (e.g., academics, dance, and music), which in turn has the potential to enhance performance in alternate domains. For example, injury rehabilitation is one area where transfer of imagery use may already be occurring. Green (1992) suggested that imagery may serve both cognitive and motivational functions in rehabilitation, similar to how it is used in competition and training. This provides support to the notion of athletes transferring the use of imagery from sport to a rehabilitation situation.

Coaches may play a role in ensuring the athletes learn more than just physical skills. Walton (1992) has reported that coaches often teach more than sport skills. They also teach life skills that remain with athletes throughout their whole life. Teaching and encouraging these skills is one way coaches can provide their athletes with valuable skills that will be beneficial in many different realms of their athletes’ lives. Recreational athletes may not achieve elite performance in their sport but providing them with mental training skills that can be used in all areas of their life can lead to positive experiences in the future.

2.5 Imagery Training Programs

It has been acknowledged that research not only should attempt to understand how athletes use imagery, but that more evidence-based interventions should be available
for athletes to learn and develop these skills, similar to how they would learn and develop physical skills (Weinberg & Williams, 2001). In addition, athletes must learn how to efficiently incorporate imagery into their physical training programs. The ultimate goal is to use imagery in a more structured and regular fashion, which will maximize the potential for performance benefits. Regular practice of imagery has been described as deliberate imagery practice (Cumming & Hall, 2002). Athletes at all levels do engage in some deliberate imagery practice but competitive athletes tend to amass more hours over the course of their careers. Since these athletes have accumulated more hours and spent more time deliberately working on their weaknesses, they see more benefits than recreational athletes. By incorporating imagery regularly in a training program a recreational athlete may become a better imager and may reap the benefits from daily practice (Cumming & Hall).

Research examining imagery use demonstrates that athletes do not seem to practice imagery in the same structured way that they approach physical practice (Barr & Hall, 1992; Rodgers, Hall, & Buckolz, 1991). A lack of imagery practice is particularly apparent among recreational athletes. For example, elite athletes report engaging in more structured imagery sessions and rate the relevance of imagery higher than recreational athletes (Cumming & Hall, 2002). Moreover, recreational athletes do not practice imagery on a regular basis (Rodgers et al.). These athletes believe that imagery has some importance, but do not feel they have the appropriate level of knowledge to develop and use their imagery skills (Rodgers et al.).

Interestingly, Cumming and Hall (2002) found no differences between elite athletes and recreational athletes in terms of viewing imagery as enjoyable. However,
elite athletes perceived imagery to be more relevant to improving their performance than recreational athletes. These athletes may not fully understand mental imagery and its relevance to performance. This lack of knowledge may be because their coaches do not introduce them to imagery. All of the findings in this section suggest the need to ensure coaches support and facilitate imagery development for athletes at all competitive levels.

2.6 Coaches’ Influence on Athletes

Coaches have the potential to play a very important role in aiding and encouraging athletes to use imagery. Coaches influence not only physical performance and behaviour of their athletes, but also their psychological and emotional well-being (Horn, 2008). The coach-athlete relationship is one of the most important influences on an athlete’s motivational level and subsequent performance (Mageau & Vallerand, 2003). Jowett and Ntoumanis (2004) have also suggested that coaches influence athletes’ level of satisfaction and sport anxiety.

Coaches, in recreational sport settings are important figures in their athletes’ lives (Smoll & Smith, 1989). Smith and Smoll (1996) sampled young athletes and found that these athletes rated positive evaluations from their coaches as more important incentives for performance than similar evaluations from their parents. Athletes’ positive views of their coaches emphasize the important role of coaches. Coaches must ensure that they always exhibit positive behaviours and share their passion and knowledge of sport with their athletes to help the athletes reach their maximum potential.

Recreational coaches typically are volunteer coaches who often have children in the sport (Bales, 2008). They usually are coaching athletes at a variety of age levels who are just learning the specific sport. These coaches should be emphasizing fun, enjoyment,
and skill development (Bales, 2008). Recreational coaches play an important role in ensuring enjoyment and health benefits are being achieved by being supportive and encouraging (Côté, Baker, & Abernethy, 2003). Mental imagery may be a way to achieve some of these expected results.

2.7 Coaches’ Encouragement of Mental Imagery

Programs aimed at teaching coaches about imagery may be beneficial given their influence on their athletes’ lives. After attending a workshop coaches may return to their athletes and incorporate imagery into practices. The athlete may be more likely to attend to and think about this new information due to the influence the coach has on that athlete.

Coaches’ encouragement of their athletes imagery use can be measured by the Coaches’ Encouragement of Athletes’ Imagery Use Questionnaire (CEAIUQ; Jedlic et al., 2007). This questionnaire was developed to understand the differences in encouragement of imagery that coaches provide to their athletes and determine how coaches encourage imagery, using the 4 W’s of imagery framework (Jedlic et al.; Munroe et al., 2000). This framework attempts to understand where, what, why, and when athletes use imagery. Using this questionnaire, research has shown that individuals coaching elite athletes are more likely to encourage the use of imagery than those coaching at less competitive levels.

Coaches’ encouragement of imagery may determine how often athletes will use imagery. Hall and Rodgers (1989) found that among figure skating coaches, imagery was regarded as the most useful mental training technique for their athletes. Barr and Hall (1992) have also shown that coaches recognize the importance and benefits of using mental imagery with competitive athletes; however, only 30% of rowers reported that
their coaches encouraged them to use imagery (Barr & Hall). These rates might be even lower among recreational coaches. A recent study of athletes competing at recreational and competitive levels indicated that almost all coaches of competitive athletes encouraged imagery use whereas the recreational coaches often did not encourage it (Jedlic et al., 2007).

Overall, research on coaches’ encouragement of imagery use has found the following trends. Coaches promote the use of imagery to competitive athletes more frequently than less competitive athletes (Jedlic et al.). With regards to the specific functions of imagery use, coaches of higher level athletes are more likely to encourage motivational general mastery imagery use to enhance performance rather than to learn skills (Jedlic et al.) These coaches are also more likely to promote the use of imagery outside of practice, when injured, and before bed. Recreational coaches provide far less encouragement of imagery towards their athletes. However, when they do encourage imagery they most often encourage imagery use in practice, competition, before performing a skill, and before competing. Motivational specific imagery is encouraged the least by coaches at all levels. Research has suggested that this is because this type of imagery may cause athletes to be too focused on outcomes (Jedlic et al.). However, Hardy, Jones, and Gould (1989) suggest that this type of imagery may actually enhance practice motivation by keeping the athletes focused on knowing their long term goals.

The research in this area is very focused on competitive sport coaches and their athletes. Acknowledging the benefits associated with using mental imagery, and continuing to expand the literature to study recreational coaches is important. Some competitive athletes may be participating in recreational sports in their off-season, and
thus may be competitive in another sport. Thus, by introducing imagery to these athletes it could benefit their all around sport performance, as well as all aspects of their life (Gould & Carson, 2008).

2.8 Coach Education Programs

It may be important to provide coaches with the opportunity to understand how to actually implement psychological skills training, such as imagery, with athletes. Recreational sport coaches may not understand mental imagery which may in turn explain why they tend not to encourage its use. It is therefore extremely important to provide thorough information to these coaches so they can understand the skill. It is also necessary before implementing any psychological skills training that they comprehend why it is so important to use with their athletes, as well as how to go about introducing and encouraging imagery to their athletes.

There may be some recreational coaches that have an understanding of mental imagery. However, they may not know how to implement and integrate mental imagery into their regular physical skills practice. Coaches also may be able to use imagery themselves, but may not fully be aware of the variety of situations in which they can use this skill. It is necessary to consider whether educating recreational sport coaches can increase their encouragement of imagery to recreational athletes.

Coaches obtain the majority of their knowledge regarding psychological skills from personal experience and coach education programs (Gilbert & Trudel, 1999). The National Coaching Certification Program (NCCP) is one of the most common coach certification programs in Canada. Recently, the NCCP has developed three different streams to target coaches at all levels. The three new streams include: the community
sport stream, the competition stream, and the instruction stream. The community sport stream is focused on providing volunteer community coaches with resources to help them ensure that their athletes are having fun, developing characteristics such as self-esteem, and encouraging lifelong participation in sport. This stream is primarily for recreational sport coaches. The instruction stream is focused on teaching skills at all levels. The competition stream is the only stream offering any mental skills training. This stream is for coaches coaching at higher levels with more competitive athletes, for example traveling city teams (Bales, 2008).

Coaches coaching at the community level and instruction stream will never benefit from learning about psychological skills. This lack of psychological skills training is potentially detrimental as recreational athletes will then never be encouraged or taught how to use any mental skills from their coaches, even though there are many associated benefits. Thus, perhaps other workshops can provide recreational coaches with information they may not be receiving from NCCP training.

Research analyzing the effects of the old system of NCCP training on coaches’ encouragement of imagery found that competitive coaches with NCCP certification encouraged greater imagery use and promoted all functions of imagery more than coaches without certification (Hall, Jedlic, Munroe-Chandler, & Hall, 2007). Further, there were no significant differences in coaches’ encouragement of imagery based on their level of NCCP certification, although there was a trend for coaches with Level 1 NCCP to provide less encouragement compared to the coaches at higher levels (Hall et al.). However, it is not known how the new NCCP system will affect these relationships. Also, in terms of recreational sport coaches, many are just volunteer coaches and
therefore training is not always required (Weiss & Hayashi, 1996). It would be expected that coaches who have received higher NCCP certification (old NCCP 2, and new competitive stream), would be more informed about psychological skills and use them more frequently than less certified coaches.

The limited research examining the coaches’ influence on psychological skill use suggests that workshops targeting psychological skills would be beneficial for coaches in a similar manner to NCCP (Hall et al., 2007). Since the new system of NCCP only provides psychological skills training for competitive coaches many coaches will never learn these important skills. Also, as there has been minimal research examining whether coach training programs teaching psychological skills are beneficial, research is needed in this area. A coach training workshop or session is possibly a very easy way to educate coaches about mental training.

The sole published example of a coach training program in sport psychology research was completed with figure skating coaches. Rodgers and Hall (1989) conducted a psychological skills training program in an intensive setting on the use of various psychological techniques with their skaters. The program involved on-ice and classroom sessions. Topics taught included mental imagery, thought stopping, and persuasion techniques. The program resulted in the coaches increasing the teaching of psychological skills in their daily lessons. The skaters coached reported improvements in their lessons and increased use of imagery following the coaches' participation in the workshop (Rogers & Hall). Rogers and Hall also found that after the training program coaches reported that of the skills taught, imagery was the most frequently used and considered the most useful skill. However, no study has examined an imagery only workshop.
2.9 Workshops Approach

Workshops aimed at developing athletes’ psychological skills can be done using either a direct or an indirect approach (Bowes & Jones, 2006). The direct approach involves the sport psychology consultant working directly with the athletes. This approach is effective because a knowledgeable professional works with the athletes. However, many athletes often are not comfortable talking with a stranger, and having a consultant is often not feasible due to the associated costs.

The indirect approach involves helping the athletes by working with the coaches, who then present the skills to their athletes (e.g., Prapavessis & Carron, 1997). With respect to teaching psychological skills, an indirect approach, similar to that used in group dynamics research in sport and exercise, may be successful by involving the coaches in the learning process (Prapavessis & Carron). By teaching coaches these new psychological skills the coaches could integrate these techniques into their regular practice sessions. Also, by teaching the skills to the coaches, the coaches can go back to their individual teams with their new knowledge. Thus, a larger group of athletes ultimately receive the beneficial information than if workshops were targeted to individual athletes.

3.0 Factors Affecting Whether Coaches Encourage Imagery

After a coach education program, determining if coaches have been provided with sufficient knowledge about imagery to teach and encourage their athletes to use imagery is necessary. Without knowledge about mental imagery coaches will not have the sufficient information to correctly implement and encourage their athletes to use imagery.
Ample knowledge is needed in order to feel comfortable discussing the skill with another person (Ernest, 1989).

Attitudes also might affect whether coaches encourage their athletes to use imagery. Attitudes often contribute to the likelihood of a person performing a specific behaviour (Ajzen & Fishbein, 2005). Thus, coaches who have positive attitudes toward using imagery may be more likely to encourage their athletes to use this skill.

It is also essential to determine if providing coaches with tools and information about imagery will increase the coaches’ self-efficacy in their own teaching abilities. Self-efficacy is defined as the “beliefs in one’s capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands” (Wood & Bandura, 1989, p. 408). A person with low self-efficacy may be less likely to perform the specific behaviour due to a feeling of inadequacy (Wood & Bandura).

Rogers and Hall (1989) attempted to understand some of the factors affecting coaches’ psychological skills use. They found that figure skating coaches did find a training program useful but this depended on their coaching experience. The more experienced coaches rated the program as more useful and thought that they could incorporate imagery into their own training sessions with their athletes. However, this study did not examine whether these coaches felt confident in teaching the skills they learned to their athletes. This confidence is important to assess because if a coach did not believe in their abilities to teach mental imagery the training program would not have been effective. The coaches will lack the tools they need to successfully implement their own imagery training. Self-efficacy to teach imagery may be an important factor affecting coaches’ encouragement of imagery to their athletes. As well, their attitudes
toward using imagery are important to examine. Coaches with negative attitudes toward using imagery may be less likely to encourage it when compared to those coaches with positive attitudes toward encouraging imagery.

3.1 Summary

In summary, athletes at recreational levels do not use as much imagery as competitive athletes and therefore may not be reaping all the possible benefits. Indeed, research has begun to show the positive benefits from implementing imagery into recreational athletes training programs (Li-Wei et al., 1992). These positive benefits may be achieved with the aid of their coaches. Coaches have been found to encourage competitive athletes to use imagery more frequently when compared to recreational athletes (Hall et al., 2007). Current coach education programs may not provide enough or any detailed information or tools to ensure that coaches feel confident in implementing imagery training programs with their athletes. Therefore, this study examined whether a workshop can be effective for increasing coaches’ encouragement of mental imagery as well as increasing their knowledge, attitudes, and confidence to teach mental imagery to their athletes.

3.2 Study Purpose

The primary purpose of this study was to examine whether an imagery workshop presented to recreational sport coaches was effective for increasing coaches’ encouragement of mental imagery among their athletes. This study is one of the few to target coaches as a strategy for promoting imagery among recreational athletes. This workshop targeting the coaches made this study unique, by directly involving the coaches in the learning process. A secondary purpose of this study was to determine factors that
influenced coaches’ encouragement of imagery, such as years coaching, sport coached, and coach training they received. Finally, this study looked at the relationship between knowledge, confidence, and attitude variables, to see if these variables affected the coaches’ encouragement of imagery use to their athletes.

3.3 Hypothesis

Given the previous research regarding coach education programs and coaches’ encouragement of mental imagery among their athletes, my main hypothesis was that coaches who attended the mental imagery workshop would provide their athletes with more encouragement to use imagery than those coaches who did not attend the mental imagery workshop. Based on previous research (e.g., Rogers & Hall, 1989), I also hypothesized that coaches would increase their encouragement of all functions of imagery, and particularly the cognitive specific function due to the importance of skill building in recreational sports.

Finally, I hypothesized that coaches attending the mental imagery workshop would feel more confident in their abilities to teach and encourage their athletes to use mental imagery compared to the control group coaches. Also, the mental imagery group coaches would demonstrate higher attitude scores toward using imagery than the control group, and this will be related to their coaching experience. Based on results of Rogers and Hall (1989) coach training program, the coaches with the most coaching experience were also hypothesized to have higher attitude scores toward using imagery than those new to coaching. Confidence, knowledge about imagery, and attitudes toward using imagery may all be factors influencing the intervention on coaches’ encouragement of mental imagery. The coaches who have learned the most, have high self-efficacy, and
positive attitudes towards encouraging their athletes to use imagery will do so most frequently when compared to coaches with lower self-efficacy, less knowledge regarding imagery, and negative attitudes toward encouraging their athletes to use imagery.
Chapter 3 Manuscript

Running head: Mental Imagery Workshop for Coaches

The Effects of a Mental Imagery Workshop on Coaches’ Encouragement of Imagery Use

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Abstract

Recreational athletes are encouraged to use mental imagery by their coaches less frequently than elite athletes (Jedlic, Hall, Munroe-Chandler, & Hall, 2007). The purpose of this study was to examine whether a mental imagery workshop would increase recreational level coaches’ encouragement of imagery to their athletes when compared to coaches attending a communication workshop. The workshops provided coaches with imagery or communication information and tools as well as role-playing opportunities. Recreational sport coaches ($N = 132; M_{age} = 41.80\text{ years, } SD = 9.67$) completed the Coaches Encouragement of Athletes Imagery Use Questionnaire (CEAIUQ; Jedlic et al.), Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004), and questionnaires assessing coaches’ demographics, confidence, knowledge, and attitudes towards imagery. These questionnaires were completed before the workshop and online four weeks later. Repeated measure MANCOVAs, controlling for sex and highest level coached, were performed comparing the coaches’ encouragement of imagery use, as well as their confidence, attitudes, and knowledge of mental imagery, across the two study groups. No group by time interactions were found for any of the five functions of imagery. However, group by time interactions were found for knowledge ($F_{(1,132)} = 5.45, p = .02, \eta^2_p = .040$), attitudes ($F_{(1,132)} = 4.45, p = .01, \eta^2_p = .055$) and confidence ($F_{(1,132)} = 7.10, p = .04, \eta^2_p = .032$) towards imagery. Paired-samples t-tests demonstrated that the mental imagery group significantly increased their confidence from baseline to follow-up ($t_{(65)} = -2.75, p = .01$). Findings provide direction for designing future coach education training programs and aid in understanding recreational sport coaches’ views on encouraging their athletes to use imagery.
Key Words: mental imagery, coach training programs, mental imagery workshop, recreational athletes
Introduction

Mental imagery is the most widely used psychological strategy in sport for performance enhancement (Morris, Spittle, & Watt, 2005). It is a multisensory experience that occurs without performing any physical movement and occurs in the absence of the actual sensory and perceptual antecedents (White & Hardy, 1998). Athletes use imagery in a variety of ways not only to enhance physical aspects of their sport performance, but also for psychological aspects. Mental imagery can be an effective addition to physical practice and is better than physical practice alone (Cumming & Hall, 2002). Using imagery before a competition leads to enhanced performance in strength and muscular endurance events, as well as improvements in motor tasks (Vealey & Greenleaf, 2006). Imagery also has benefits for increasing self-confidence (Callow, Hardy, & Hall, 2001) and motivation (Martin & Hall, 1995), not only in sport but all areas of life (Gould & Carson, 2008).

An Applied Model of Mental Imagery represents how athletes use mental imagery in sport and guides interventions (Martin, Mortiz, & Hall, 1999). The model consists of four main components; 1) the sport situation, 2) the functions of imagery, 3) the desired outcome, and 4) the individual’s imagery ability. The first component of the model, the sport situation, refers to when and where the athlete uses mental imagery. The second component of the model is the function of imagery used. Paivio (1985) suggested that imagery serves either a cognitive or motivational function, and that these functions can operate at either a general or specific level. As such, there are five imagery functions that have been identified in practice and competition situations: cognitive general (CG), cognitive specific (CS), motivational specific (MS), motivational general arousal (MG-A)
and motivational general mastery (MG-M) (Hall, Mack, Paivio, & Hausenblas, 1998). The desired outcomes constitute the third component of the model. There are three outcomes associated with the functions of imagery: acquisition and improved performance of skills and strategies, modification of cognitions, and regulation of arousal and anxiety (Martin et al.). The final component of the model is the athlete’s imagery ability. Imagery ability moderates the relationship between the function of imagery used and the desired outcome.

Besides imagery ability, other factors may interact and affect the components in this model, including the competitive level of the athlete and the influence of coaches. Athletes, especially at higher competitive levels, use imagery more extensively than recreational athletes (Hall, 2001; Cumming & Hall, 2002). However, researchers have proposed that strategies for teaching psychological skills to competitive athletes are appropriate for non-competitive athletes in sports. For example, Li-Wei, Qi-Wei, Orlick, and Zitzelsberger (1992), demonstrated that recreational athletes who used mental imagery to visualize table tennis shots improved the accuracy and technical quality of their shots. When considering these benefits, it is clear that mental imagery should not only be emphasized among competitive athletes but also among recreational athletes.

Moreover, mental skills should be taught to recreational athletes to not only benefit their sport performance but all aspects of their life. These transferable skills are often referred to as life skills. Life skills have been defined as, “those internal personal assets, characteristics and skills such as goal setting, emotional control, self-esteem, and hard work ethic that can be facilitated or developed in sport and are transferred for use in non-sport settings” (Gould & Carson, 2008, p.353). Many of the skills learned in sport,
such as performing under pressure, handling success and failure, and solving problems, are transferable to other life domains (Danish, Petitpas, & Hale, 1992). Mental imagery can be used to aid in the creation of these skills. Recreational athletes may not achieve elite performance in their sport but providing them with mental training skills that can be used in all areas of their life can lead to future positive experiences in all domains of life.

Researchers have also suggested that other influential people, such as coaches, should be accounted for in this Applied Model of Mental Imagery (Jedlic et al., 2007). Coaches have the potential to play an important role in teaching athletes the various uses of imagery and may aid in determining the function of imagery athletes need to use in order to obtain desired outcomes. Jedlic et al. uncovered several trends in how coaches’ encouragement of imagery varies by competitive level. Competitive coaches often promote the use of imagery to their athletes whereas recreational sport coaches rarely encourage this skill. However, when recreational coaches do encourage imagery, they most often encourage imagery use only in practice. Recreational coaches should be encouraging their athletes to use imagery in a variety of situations to encourage the practice of imagery similar to practicing any physical skill. Coaches lacking education in mental imagery may not understand the importance of encouraging their athletes to use imagery in different situations.

Coaches obtain the majority of their knowledge regarding psychological skills and mental imagery from personal experience and coach education programs (Gilbert & Trudel, 1999). For example, in Canada the National Coaching Certification Program (NCCP) is one of the most common coach education programs. Recently, it has developed three different streams to target coaches at all levels; the community sport
stream, the competition stream, and the instruction stream. The community sport stream is focused on providing volunteer community coaches with resources to help them ensure that their athletes are having fun, developing characteristics such as self-esteem, and encouraging lifelong participation in sport. This stream is primarily for recreational sport coaches. The instruction stream is focused on teaching skills at all levels. The competition stream is the only stream offering any mental skills training (Canadian Coaching Association, 2008).

Accordingly, coaches working at the community level and instruction stream do not learn about psychological skills. This lack of coach psychological skills education is potentially detrimental as recreational athletes will then never be encouraged or taught many important psychological skills, for example mental imagery, from their coaches. Research analyzing the effect of the former NCCP training program, which included psychological skills education for coaches of all levels, found that coaches with NCCP certification encouraged greater imagery use and promoted all functions of imagery more than coaches without certification (Hall, Jedlic, Munroe-Chandler, & Hall, 2007).

The research examining coaches’ influence on psychological skills use, such as mental imagery, suggests that workshops targeting these skills would be beneficial for coaches (Hall et al., 2007). Workshops may also be more beneficial with coaches as adherence rates for athlete-centered psychological skills programs have been problematic (Bull, 1991). Research has yet to examine the effects of a coach-centered imagery training program. However, one published study describes the success of a multi-skill intervention, including imagery. Hall and Rodgers (1989) conducted a psychological skills training program delivered in an intensive setting on the use of various
psychological techniques with their skaters. The program involved on-ice and classroom sessions. The program resulted in the coaches significantly increasing the teaching of psychological skills in their daily lessons. Hall and Rodgers also found that after the training program coaches reported that imagery was the most frequently used psychological skill they taught and the most useful to implement with their athletes. Accordingly, coaches might find a workshop focused on imagery particularly useful.

Therefore the primary purpose of this study was to examine whether an imagery workshop presented to coaches of recreational athletes was effective for increasing coaches’ encouragement of mental imagery among their athletes. Given the previous research (Hall et al., 2007; Jedlic et al., 2007), regarding coach education programs and coaches’ encouragement of mental imagery among their athletes, we hypothesized that coaches who attended the mental imagery workshop would provide their athletes with more encouragement to use imagery than those coaches who did not attend the mental imagery workshop.

Methods

Participants

This study employed convenience sampling to obtain a sample size of 153 recreational level coaches (M age = 41.80 years, SD = 9.56). One hundred and thirty-two coaches completed the follow-up. Sixty-six of the coaches were in the mental imagery group, and sixty-six coaches were in the communication group. Thirty-three of the coaches were female and 99 were male. A priori sample size was computed to ensure that the experimental design was sensitive and powerful enough to test the proposed hypothesis. Assuming a power of 0.8, a small effect size (f²) of 0.1, and p < 0.05, a
sample size of 130 was needed. We were conservative in estimating a small effect size because this workshop had not been tested previously. Also, Cumming, Hall, and Shambrook (2004) found small effect sizes with a similar intervention directed towards athletes.

Participants were coaches of recreational level team sports in Ontario. The coaches were coaching athletes between the ages of 13 and 18 years. The main sports coached were hockey (51%), basketball (20%), and volleyball (17%). Team sports were chosen because a workshop could be applicable for all coaches in a similar manner. Many of the fundamental aspects of team sports are very similar, such as offense and defense, so information and tools taught could be helpful in a wide variety of team sports. Also, team sport coaches usually require less certification, especially at a recreational level, than individual sport coaches (Gilbert & Trudel, 1999). Coaches who received the Competitive stream NCCP training (after 2009) or Level 2 NCCP training (before 2009) or higher were excluded from this study as they may already have received similar imagery training.

**Measures**

**Demographic Questionnaire.** Coaches completed a questionnaire asking them to indicate their sex, age, age of athletes coached, highest level coached (recreational, high school/elementary school, regional/university, national), years coaching (1-2, 3-4, 4+), sport coached, and whether or not they had taken NCCP Level 1. Highest level coached, their gender, years coaching, and previous sport psychology training were measured using a multiple choice format.
Coaches’ Encouragement of Athletes’ Imagery use Questionnaire (CEAIUQ). The CEAIUQ (Jedlic et al., 2007) was used to measure the amount of encouragement to use imagery that coaches provide their athletes. The CEAIUQ consists of 37 items, representing the five ‘why’ subscales of imagery use: a) CS: n=6, e.g., when in season, I encourage my athletes to image each section of an event/game, b) CG: n=6, e.g., when in season, I encourage my athletes to consistently perform a skill perfectly in their mind while imaging it, c) MS: n=6; e.g., when in season, I encourage my athletes to image winning a medal, d) MG-M: n=6, e.g., when in season, I encourage my athletes to imagine being mentally tough, and e) MG-A: n=6, e.g., when in season, I encourage my athletes to feel relaxed when imaging themselves participating in their sport. It also contains 7 single-item measurements of ‘where/when’ the coaches’ encourage their athletes to use imagery (e.g., when in season, I encourage my athletes to use imagery in practice). The ‘what’ subscale was omitted. It was not important in this study to determine the specific content of what the coaches are encouraging their athletes to imagine. The focus was solely on increasing coaches’ encouragement of imagery to their athletes and not to determine what the coaches were encouraging to be imaged. For each item, participants were asked to indicate how frequently they encourage a specific aspect of imagery on a 7-point scale, ranging from 1 (rarely) to 7 (often). The CEAIUQ has demonstrated adequate psychometric properties (Jedlic et al., 2008). The five functions of imagery use, measured by the CEAIUQ, also had acceptable internal consistencies (CS: \( \alpha = .96 \), CG: \( \alpha = .92 \), MS: \( \alpha = .92 \), MG-M: \( \alpha = .93 \), and MG-A: \( \alpha = .93 \)) (Jedlic et al.). Internal consistencies for the current study are reported in the results section.


**Confidence Questionnaire.** Coaches completed three questions regarding their confidence in teaching mental imagery (e.g., I feel confident in my ability to teach my athletes mental imagery, I feel confident in my ability to plan a mental imagery session, and I feel confident in my ability to explain why mental imagery is beneficial). This questionnaire was developed for this study using a framework developed by Bandura (1982). For each item, participants were asked to indicate how they felt regarding that statement on a 10-point scale, ranging from 1 (not confident at all) to 10 (extremely confident). Internal consistency for the subscale was acceptable ($\alpha = .93$).

**Knowledge Questionnaire.** Coaches completed three questions regarding their knowledge about mental imagery (e.g., I feel like I have the necessary information to teach my athletes mental imagery, I feel like I have the necessary tools to teach my athletes mental imagery, and I can see the benefits of using mental imagery with my athletes). This questionnaire was created for this study. Participants were asked to indicate how they felt regarding each statement on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency for the subscale was acceptable ($\alpha = .84$).

**Attitude Questionnaire.** Coaches completed six questions regarding their attitudes toward teaching mental imagery (e.g., I think that teaching mental imagery to my athletes is interesting). A modified version of Ajzen’s Attitude Questionnaire (1991) was used. Participants were asked to indicate how they felt regarding each statement on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency for the subscale in the current study was acceptable ($\alpha = .91$).
**Filler Items.** Coaches completed the Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004) to disguise the nature of the study. The CART-Q is a brief 11-item measure, with three subscales measuring commitment (n=3, e.g., I feel close to my athletes) closeness (n=4, e.g., I like my athletes), and complementarity (n=4, e.g., When I coach my athletes I feel at ease), of the coach-athlete relationship.

Participants were asked to indicate how they felt regarding each statement on a 7-point scale, ranging from 1 (rarely) to 7 (often). Research examining the reliability and validity of the CART-Q suggest that this measurement can be used in research related to understanding the coach-athlete relationship (Jowett & Ntoumanis, 2004). All subscales in this study had acceptable internal consistency (commitment: $\alpha = .82$, closeness: $\alpha = .87$ and complementarity: $\alpha = .88$) (Jowett & Ntoumanis).

Coaches also completed a series of communication related items related to their attitudes, knowledge and confidence. Coaches completed three questions about their confidence in improving their communication with their athletes, as well as three questions about their knowledge of good communication. Coaches also answered six questions about their attitudes towards improving their communication with their athletes. For each knowledge and attitude item participants rated how they felt on a scale from 1 (not at all important) to 7 (very important). Confidence was rated on a scale from 1 (not confident at all) to 10 (extremely confident). All internal consistencies were found to be acceptable (knowledge: $\alpha = .91$, attitudes: $\alpha = .94$, and confidence: $\alpha = .87$).

**Importance of Imagery Question.** Coaches answered one question regarding how important they thought it was to encourage recreational athletes to use mental imagery. Participants rated how they felt on a scale from 1 (not at all important) to 7
(very important). They were also asked to explain their response by indicating why they chose a particular rating.

**Experimental Design**

This study employed a non-randomized design with coaches attending a workshop based on their availability. Coaches were asked to sign up for a workshop time that was convenient for them. There were two different workshop topics: mental imagery and communication. The workshop topics alternated from one workshop time slot to the next; however, the coaches did not know the topic of the workshop offered in a specific time slot. This was done to alleviate the coaches choosing a specific workshop based upon its topic. The coaches were told the workshop would provide them with valuable information to assist with their coaching.

**Workshops**

All coaches attended one workshop. Fourteen workshops were held with half of the workshops teaching mental imagery and the other half teaching about effective communication. Approximately 8-15 coaches attended each workshop. The primary researcher for this study led each of the workshops. To help with participant retention over the study period, coaches in the control group participated in a workshop aimed at improving their communication with their athletes. This topic is unrelated to the main topic of interest and thus should not have influenced their imagery encouragement.

The mental imagery workshop lasted approximately one hour and a half and was based on a workshop for athletes created by Cumming et al. (2004). Coaches were provided with a definition of mental imagery and the many benefits associated with using imagery. Through a verbal presentation they were taught about the Applied Model of
Mental Imagery and how to guide athletes through selecting the functions of imagery and addressing the 4 W’s of imagery. The 4 W’s of imagery describe where/when to use imagery, why to use it, and what to image. During this presentation, they also learned about the importance of using all senses, and making all images as vivid and real as possible. This presentation was approximately thirty minutes. Coaches also listened to two imagery scripts that guided them through imaging from both the internal and external perspective. They then partook in a discussion as to which perspective they thought was easier and why. The remainder of the workshop involved the coaches participating in activities that involved working through how they could use the different functions of imagery with their team. They engaged in a role playing task that required them to mimic teaching imagery. After the role playing tasks any questions were addressed. The final ten minutes of the workshop involved discussing tips for implementing imagery with their athletes, as well discussing problems that may be encountered.

Similarly, the communication workshop lasted approximately one hour and a half. It began with basic definitions of communication and the many benefits associated with effective communication. Methods of communication, as well as the most common ways to communicate were also discussed. The coach-athlete communication process was explained (Martens, 1987). This presentation lasted approximately 30 minutes. Barriers to communication were then discussed and the coaches participated by listing barriers to communication with their athletes. They then had to determine how they could eliminate these barriers. The remainder of the session involved coaches completing a role playing activity where they pretended to have a one-one talk with an athlete, and consider all aspects to ensure effective communication. The last ten minutes involved the discussion
of factors of effective communication as well as “what if” scenarios, and tips for effective communication.

**Procedure**

Coaches were recruited by contacting recreational leagues throughout Ontario and by using a variety of other recruiting methods, such as posters, email-lists, and face-to-face recruitment. As coaches were recruited, they signed up to attend a workshop based on their availability. The workshop was piloted tested to gather feedback before being conducted with the coaches. It was pilot tested with a group of researchers to gather their feedback about the clarity of the workshop. Some of the researchers were not familiar with the imagery literature and this was beneficial to determine if through the workshop they could clearly understand mental imagery. At the beginning of all workshops, the coaches completed the demographic questionnaire, CEAIUQ, and CART-Q, as well as the attitudes, confidence, and knowledge questions. Four weeks after the workshop, the coaches completed the CEAIUQ, CART-Q and the attitudes, confidence and knowledge questions online. One month later the importance of imagery question was sent by e-mail to all coaches.

Coaches in the control group had an opportunity to attend a mental imagery workshop at the conclusion of the study to ensure that they were not prevented from receiving any valuable information that may help their athletes achieve optimal performance. Seven coaches participated in this additional workshop.

**Analyses**

All data was analyzed in Statistical Package for the Social Sciences (SPSS) version 17. Chi square tests were performed on categorical variables including sex, sport
coached, NCCP training and years coaching to determine if any differences existed between experimental groups. An ANOVA was conducted to determine if any differences existed between groups for coaches’ age. Three separate repeated measures multivariate analysis of covariance (MANCOVA), controlling for coaches’ sex and highest level coached, were performed to determine if there were significant \( p < .05 \) group effects for: 1) the five functions of imagery from the CEAIUQ, 2) the where/when questions from the CEAIUQ, and 3) the measures assessing coaches’ knowledge, attitudes, and confidence towards encouraging their athletes to use imagery. Follow-up ANCOVAs and paired-samples t-tests were conducted to analyze the variables separately to determine where differences occurred. As an exploratory analysis, correlations were calculated to determine if there were any significant relationships between the CEAIUQ variables and coaches’ knowledge, attitudes, and confidence levels. Finally, an analysis of covariance (ANCOVA) was run to determine if there were any differences between groups on their perceptions of the importance of encouraging their athletes to use imagery. The explanation of this answer was analyzed using content analysis. Meaning units were categorized according to whether coaches thought using imagery was important, neutral or not important, and then grouped together based on similar characteristics. These groupings created categories. The meaning units within each category were similar, and were distinct from those in other categories. Inter-rater reliability was calculated between two raters. This was done by giving a researcher, who was familiar with content analysis and blind to the study conditions, 25% of the meaning unit data as well as all the categories created. The researcher was asked to group the
meaning units into one of the categories. Inter-rater agreement was calculated to determine the reliability between the two coders.

**Results**

**Data Cleaning and Internal Reliability**

Before conducting any analyses, the data were screened for any missing values, errors in data entry, and to ensure conformity with all relevant statistical assumptions were met. No mistakes or missing data were found. All data conformed to the statistical assumptions necessary to perform the tests. The data were tested for normality, independence, and homogeneity of variance. Normality was tested by eliminating the possibility that the data had skewness or kurtosis. All values for these tests were between 0 and 1. Box’s M test was conducted and was not significant ($p < .05$) to determine homogeneity of variance. Reliability values, means, and standard deviations for each subscale of the CEAIUQ, as well as the knowledge, attitudes, and confidence questionnaires, are presented in Table 1. All subscales had adequate internal consistencies. Also, inter-rater reliability for the added qualitative question was 85%.

**Randomization Check**

A Chi Square analysis revealed that there were no significant differences between the two groups with respect to their sex, highest level coached, sport coached, and NCCP training ($ps > .05$). Also, an ANOVA showed no significant differences between the two groups with respect to age of the coaches ($p > .05$). Demographic information for each group is shown in Table 2.
Testing for Covariates

The demographic variables were tested with ANOVAs to determine if any of the variables could be used as covariates. Sex of the coaches and highest level coached interacted with the independent variables and were used as covariates.

Also when examining the covariates some interactions were found. Significant sex by time interactions were found for knowledge \( (F_{(1,132)} = 4.14, p = .04, \eta^2_p = .03) \), motivational specific imagery \( (F_{(1,132)} = 3.99, p = .04, \eta^2_p = .03) \), using imagery outside of practice \( (F_{(1,132)} = 6.43, p = .01, \eta^2_p = .05) \), and using imagery post competition \( (F_{(1,132)} = 4.21, p = .04, \eta^2_p = .03) \). Follow-up paired-samples t-tests demonstrated that knowledge remained stable in both sexes over time, \( p > .05 \). The paired-samples t-tests comparing motivational specific imagery from baseline to follow-up were not significant. Following the intervention women tended to increase their encouragement of this type of imagery while men did not tend to change. The paired-samples t-test comparing imagery use outside of practice over time was significant for women \( (t_{(65)} = -3.38, p < .01) \). Women significantly increased their encouragement of imagery outside of practice from baseline to follow-up. Men’s encouragement did not significantly change over time. Finally, from baseline to follow-up women significantly increased their encouragement of imagery after competition \( (t_{(65)} = -3.50, p < .01) \). Men’s encouragement changes were not significant although they tended to increase this encouragement of imagery after competition from baseline to follow-up as well.

There were also significant interactions for highest level coached (recreational/high school and regional/varsity) over time for cognitive specific imagery \( (F_{(1,132)} = 7.94, p = .01, \eta^2_p = .06) \), motivational specific imagery \( (F_{(1,132)} = 3.97, p = .04, \eta^2_p = .03) \).
η_p^2 = .03), and using imagery post competition (F_{(1,132)} = 4.58, p = .03, η_p^2 = .03). Followup paired-samples t-tests revealed that coaches who have previously coached at higher levels (regional/provincial), significantly increased their encouragement of cognitive specific imagery (t_{(65)} = -2.61, p = .01), as well as motivational specific imagery (t_{(65)} = -2.51, p = .02) from baseline to follow-up. No changes were found for coaches previously coaching at lower levels (recreational/high school, p > .05). Finally coaches who had previously coached at recreational/high school levels, and at regional/provincial levels significantly increased their encouragement of imagery after competition from baseline to follow-up (t_{(65)} = -2.30, p = .02; t_{(65)} = -2.28, p = .03).

**Hypothesis Testing**

A 2 (group) x 2 (time) repeated measures MANCOVA was performed to analyze the coaches’ encouragement of the five functions of imagery; cognitive general (CG), cognitive specific (CS), motivational specific (MS), motivational general-mastery (MG-M), and motivational general-arousal (MG-A). The MANCOVA did not reveal any significant differences for any of the five functions of imagery (ps > .05). Means and standard deviations are shown in Table 3.

A second 2 (group) x 2 (time) repeated measures MANCOVA was conducted to analyze the seven subscales of where/when coaches encourage their athletes’ to use imagery. The MANCOVA revealed a main effect for time (Pillai’s trace = .08, F_{(7,132)} = 4.72, p = .01, η_p^2 = .07), but not a group by time interaction (p > .05). Follow-up repeated measures ANCOVAs revealed main effects for time for encouraging imagery outside of practice (F_{(1,132)} = 8.25, p = .01, η_p^2 = .06) and before bed (F_{(1,132)} = 3.96, p = .04, η_p^2 =
All coaches increased their encouragement of imagery in these situations from pre to post intervention. Means and standard deviations are shown in Table 4.

A third 2 (group) x 2 (time) repeated measures MANCOVA was conducted to analyze the coaches’ knowledge, attitudes, and confidence levels regarding imagery. The group by time interaction was significant (Pillai’s trace = .07, $F_{(3,132)} = 3.51, p = .02, \eta^2_p = .08$). Follow-up repeated measures ANCOVAs revealed significant group by time interactions for all variables (knowledge: $F_{(1,132)} = 5.49, p = .02, \eta^2_p = .04$, attitudes: $F_{(1,132)} = 4.45, p = .04, \eta^2_p = .03$, confidence: $F_{(1,132)} = 7.10, p = .01, \eta^2_p = .05$). The paired-samples t-tests demonstrated that confidence significantly increased from baseline to follow-up in the mental imagery group ($t_{(65)} = -2.75, p = .01$), and significantly decreased in the control group ($t_{(65)} = -2.34, p = .02$). Paired-samples t-tests revealed that knowledge remained stable in the control group and the mental imagery group from pre-intervention to post intervention ($p > .05$). The separate paired-samples t-tests comparing attitudes from baseline to follow-up were not significant. However, the mental imagery group did tend to have more positive attitudes following the intervention while the control group’s attitudes tended to remain unchanged. Means and standard deviations are shown in Table 5.

Finally, the coaches’ perceived importance of encouraging imagery with recreational athletes was examined using an ANCOVA. No significant differences ($p > .05$) were found between the control group ($M = 4.71, SD = .27$), and the mental imagery group ($M = 5.05, SD = .28$). A content analysis was completed on the coaches’ responses to why they thought encouraging imagery with recreational athletes was or was not important, as seen in Figure 1.
The results are categorized according to the rating the coaches gave the importance of using imagery. These ratings were used to create three subgroups that included whether the coaches thought encouraging imagery to their recreational athletes was important, they were unsure, or did not think it was at all important. From these subgroups, categories were created exemplifying the main reasons for encouraging or not encouraging these athletes to use imagery. Of the coaches surveyed, sixty-one percent thought encouraging athletes to use imagery was important while twenty-two percent did not think encouraging imagery use with athletes was important. The remaining seventeen percent were neutral regarding their perception of how important it was to encourage imagery use in athletes. The main reasons for why some coaches thought encouraging imagery was not important were: they did not have enough time, and they wanted their athletes to have fun, enjoy the sport, and participate. The coaches who took a neutral stance and neither thought encouraging their athletes to use imagery was important nor unimportant, suggested that imagery was for enhancement purposes and not essential, may not work for everyone and they did not fully understand imagery. Finally, the coaches who considered encouraging imagery as being very important had reasons such as, it was important for performing successfully, useful in other areas of their life, and improves skills/game. Also, these coaches suggested that it was important to use the brain, encourage imagination and that the relationship between doing and thinking was very important.

**Correlation Analysis**

Bivariate correlations were calculated to demonstrate the relationship between the functions of imagery and coaches’ confidence, knowledge, and attitudes towards
encouraging their athletes to use imagery. The results of these correlation analyses, presented in Table 6, indicate that confidence, knowledge and attitudes were significantly and positively associated with all five functions of imagery post-workshop ($p < 0.01$), with $r$ values ranging from 0.29 to 0.65. This means that the higher the confidence, knowledge, or attitude level, the higher the score for all five functions of imagery post-workshop.

**Discussion**

The present study examined whether a mental imagery workshop would be effective in increasing coaches’ encouragement of imagery to their athletes. The imagery workshop produced some favourable results. The mental imagery group’s confidence significantly increased from baseline to follow-up whereas the controls group’s confidence decreased. The mental imagery group also tended to have more positive attitudes following the intervention while the control group’s attitudes tended to remain unchanged. Although these findings are promising, the workshop did not increase coaches’ encouragement of the five functions of mental imagery to their athletes. Interestingly all coaches, regardless of the workshop they attended, increased their encouragement of imagery outside of practice and before bed, from baseline to follow-up. These findings will be discussed beginning with the coaches’ confidence and attitude changes.

The mental imagery workshop showed positive benefits on coaches’ confidence towards using imagery. The observed increase in confidence is consistent with the previous psychological training workshop done with coaches. Hall and Rodgers (1989) demonstrated that after their intensive training program, the coaches’ confidence in
teaching the new mental skills increased as well. The imagery workshop in this study involved role playing situations as if encouraging their athletes to use imagery. This interactive situation may have increased the coaches’ confidence levels after they had successful completed the task. Confidence can be increased through mastery experience (Bandura, 1982). The role playing activities may have contributed to confidence increasing to a higher level than attitudes and knowledge. Attitudes towards using imagery did demonstrate a similar pattern but did not reach standard levels of significance. The workshop provided the coaches with information about why using imagery is beneficial and this may have positively affected the coaches’ attitudes.

Although the imagery workshop did change coaches’ thoughts about imagery, we did not change coaches’ perceptions of their behaviours. In the context of complex behaviours it is quite common to observe a discrepancy between a person’s thoughts (e.g. self-efficacy and attitudes) and his or her behaviour (Oettingen, 2000). Perhaps the workshop should be restructured to facilitate behaviour change. Coach behaviours are complex and can be difficult to change (Gilbert & Trudel, 1999). The workshop may not have provided the coaches with enough information to know how to teach these new psychological skills to their athletes. Providing more workshop sessions may have aided in increasing their encouragement of mental imagery. For example, Hall and Rodgers’ (1989) study with figure skating coaches involved many more components. Not only did the coaches go to a variety of workshops, but they also received hands-on training. It is possible that one workshop is not sufficient to lead to increases in coaches’ encouragement of imagery. Also, as not all coaches thought encouraging imagery with
their recreational athletes was important, emphasizing the value of imagery to these coaches may be necessary.

It is interesting to note that simply attending a workshop increased the coaches’ encouragement of imagery in certain contexts (i.e., outside of practice and before bed). The fact that all coaches increased their encouragement of these two areas may be also due to exposure to the questionnaires. This exposure may have made them aware of situations in which they could encourage the use of mental imagery. The particular contexts in which increased encouragement of imagery was observed may reflect the time constraints recreational coaches experience in practice. Practice time is limited. Recreational coaches are focused on skill learning and development and have the perception that including imagery would take away from instruction or physical practice time, which is not necessarily the case (McCloskey, 1999). Therefore they may not be likely to incorporate imagery sessions with physical training but may take the time to discuss with athletes what they can do on their own time.

Despite the preliminary contributions of this study, it highlights several areas for future research. As previously mentioned, the workshop content needs to be modified. It is necessary to determine what exactly should be taught to the coaches and the best method for doing so. Qualitative interviews with the coaches could provide this added information.

The workshop was also based on a workshop with athletes (Cumming et al., 2004). It is possible that the presentation of the material was not done in a way to allow the coaches to encourage their athletes to use these skills. Although the workshop was adapted to suit the coaches’ needs and provide them with role playing situations to get
experience with how to encourage and teach mental imagery, that may not have been enough. Having a session with the athletes as well may have been helpful. Teaching the athletes about imagery may allow the coach to feel more comfortable encouraging imagery. This might be because the athletes would already have an understanding of imagery and the coaches would not have to introduce a completely new skill. Also, a two-part workshop may be effective so the coaches have an opportunity to try out what they have learned and meet again for more information and troubleshooting.

Due to the fact that the coaches in this study were recreational coaches they may need more time to learn and comprehend new psychological strategies than more competitive coaches. Coaches at competitive levels are more likely to have played sports competitively and more often have reached elite status themselves as athletes (Reade, Rodgers, & Spriggs, 2008). Thus, they might already have used imagery strategies personally and have experience with them. This experience may facilitate their learning in an imagery workshop. Recreational coaches in this study, who had previously coached at higher levels, did seem to respond more positively to all questions within this study. It may be more beneficial to do multiple workshops with recreational coaches who lack elite sport experience to give them added time to process this unique information. Coaches may also need help planning how they can actually build imagery into practice without it being a full session.

It is also necessary to distinguish why exactly these adults are coaching. At recreational levels, coaches are often volunteer parents with a child on the team. Other coaches may just be volunteering to assist a league in need, or some coaches may actually love the sport and want to stay involved after their athletic career has ended (Wiersma &
Sherman, 2005). Determining why the coach is coaching could aid in understanding why a workshop may or may not be effective for that coach. Depending on the reason, coaches may approach their coaching in completely different ways. Volunteering to help with the league may lead to a coach just teaching skills whereas a coach with a love of the sport may put in the extra effort to ensure athletes get the best possible sport experience and take the time to incorporate different skills and strategies into their coaching.

As well, recreational coaches may feel that all of their time needs to be spent on skill development or just playing the game, and that teaching imagery may take away from that. These coaches might also feel that they do not have the expertise to teach all the skills and strategies of the sport, and therefore would not even consider introducing psychological skills. Coaches who chose to participate in this study may also be different than those coaches who chose not to participate. These coaches may be more open to learning about new coaching information. This could lead to bias resulting and preventing the findings from being generalizable to the recreational sport coach community.

An obvious limitation of this study was the fact that the data were only gathered by asking for the perception of the coaches. Including the athletes, and asking them whether their coaches actually encouraged imagery to a higher degree after the workshop would solidify the answers from the coaches. The athletes could also provide valuable insight into whether this actually caused them to increase their own use of imagery.

To our knowledge this study was the first study to provide coaches with a workshop teaching them about mental imagery and the first to be done with recreational sport coaches. It has provided some insight in understanding that 61% of recreational sport coaches in this study do think that using mental imagery with their athletes can be
beneficial. This study also aided in understanding that a single workshop is not enough to increase encouragement of imagery, but that it can lead to increases in confidence in encouraging their athletes to use imagery.

Therefore this study should serve as an initial framework for creating future workshop studies. Findings can contribute to imagery research by reinforcing that coaches do feel that encouraging recreational athletes to use imagery can lead to improvements in all areas of their life, not specifically just in sports. This study also demonstrated how a single workshop can lead to increases in confidence levels. Imagery research should continue to be done with recreational coaches to ensure they can provide their athletes with encouragement to use imagery. More research needs to be done to convince coaches of the value of psychological skills for their recreational athletes. These athletes should not be segregated from learning this beneficial psychological skill that can lead to many positive performance and life changes.
References


Figure 1. Coaches’ response to why they thought encouraging imagery with recreational athletes was or was not important. Number in parentheses refers to the number of coaches with meaning units falling into the specific category.
<table>
<thead>
<tr>
<th>Variable</th>
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<th></th>
<th>Post Workshop</th>
<th></th>
<th></th>
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<td>α</td>
<td>M</td>
<td>SD</td>
<td>α</td>
</tr>
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</table>

Notes. CG = cognitive general, CS = cognitive specific, MS = motivational specific, MGM = motivational general-arousal, MGA = motivational general-arousal. Functions of imagery, knowledge, and attitudes were rated on a 7-point scale. Confidence was rated on a 10-point scale.
Table 2. Coach demographic information by group and sex.

<table>
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<tr>
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Table 3. Means and standard deviations for each subscale of the Coaches’ Encouragement of Athletes’ Imagery Use Questionnaire, separated by groups for pre and post workshop.

<table>
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Notes. CG = cognitive general, CS = cognitive specific, MS = motivational specific, MGM = motivational general-arousal, MGA = motivational general-arousal. All rated on a 7-point scale.
Table 4. Means and standard deviations for each where/when factor of the Coaches’ Encouragement of Athletes’ Imagery Use Questionnaire, separated by groups for pre and post workshop.

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<tr>
<td>Bed</td>
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Notes. All rated on a 7-point scale.
Table 5. Pre and post means and standard deviations for coaches’ knowledge, attitudes, and confidence of using imagery for the control and mental imagery group.

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Notes. * p < .05. Knowledge and attitudes were rated on a 7-point scale. Confidence was rated on a 10-point scale.
Table 6. Bivariate correlations between the functions of imagery and coaches’ confidence, knowledge, and attitudes towards encouraging their athletes to use imagery.

<table>
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</tr>
<tr>
<td>CG     Imagery</td>
<td>0.51*</td>
<td>0.52*</td>
<td>0.29*</td>
<td>0.59*</td>
<td>0.58*</td>
<td>0.41*</td>
</tr>
<tr>
<td>CS Imagery</td>
<td>0.59*</td>
<td>0.54*</td>
<td>0.22*</td>
<td>0.66*</td>
<td>0.65*</td>
<td>0.35*</td>
</tr>
<tr>
<td>MS Imagery</td>
<td>0.40*</td>
<td>0.31*</td>
<td>0.14</td>
<td>0.54*</td>
<td>0.52*</td>
<td>0.29*</td>
</tr>
<tr>
<td>MGM Imagery</td>
<td>0.62*</td>
<td>0.57*</td>
<td>0.31*</td>
<td>0.60*</td>
<td>0.57*</td>
<td>0.32*</td>
</tr>
<tr>
<td>MGA Imagery</td>
<td>0.51*</td>
<td>0.53*</td>
<td>0.31*</td>
<td>0.62*</td>
<td>0.61*</td>
<td>0.33*</td>
</tr>
</tbody>
</table>

Notes: *p < 0.01. CG = cognitive general, CS = cognitive specific, MS = motivational specific, MGM = motivational general-arousal, MGA = motivational general-arousal.
This study involved a communication workshop as a control group. The workshop provided coaches with tools and information to improve their communication with their athletes. Corresponding communication measurements were taken. This section describes the communication aspect of this study. It is a separate section because it does not contribute to the purpose of this study but can provide some added information. For example, communication workshop may impact the coaches’ communication and this may be of interest to researchers who examine aspects, other than imagery, related to coaching.

**Method**

**Measures**

**Coach-Athlete Relationship Questionnaire (CART-Q).** Coaches completed the CART-Q (Jowett & Ntoumanis, 2004) to disguise the nature of the study. The CART-Q is a brief 11-item measure, with three subscales measuring commitment (n=3, e.g., I feel close to my athletes) closeness (n=4, e.g., I like my athletes), and complementarity (n=4, e.g., When I coach my athletes I feel at ease), of the coach-athlete relationship. Participants were asked to indicate how they felt regarding each statement on a 7-point scale, ranging from 1 (rarely) to 7 (often). Research examining the reliability and validity of the CART-Q suggest that this measurement can be used in research related to understanding the coach-athlete relationship (Jowett & Ntoumanis, 2004). All subscales in this study had acceptable internal consistency ($\alpha = 0.82$ for Commitment, $\alpha = 0.87$ for Closeness, and $\alpha = 0.88$ for Complementarity).

**Confidence Questionnaire.** Coaches completed three questions regarding their confidence in improving their communication with their athletes (e.g., I feel confident in
my ability to improve my communication with my athletes, I feel confident in my ability to plan a way to improve communication with my athletes and I feel confident in my ability to explain why effective communication is beneficial). For each item, participants were asked to indicate how they felt regarding that statement on a 10-point scale, ranging from 1 (not confident at all) to 10 (extremely confident). Internal consistency for the subscale was acceptable ($\alpha = 0.92$).

**Knowledge Questionnaire.** Coaches completed three questions regarding their knowledge of good communication (e.g., I feel like I have the necessary information to improve my communication with my athletes, I feel like I have the necessary tools to improve my communication with my athletes, and I can see the benefits of improving my communication with my athletes). Participants were asked to indicate how they felt regarding each statement on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency for the subscale was acceptable ($\alpha = 0.85$).

**Attitude Questionnaire.** Coaches completed six questions regarding their attitudes towards improving their communication with their athletes (e.g., I think that improving my communication with my athletes is beneficial). Participants were asked to indicate how they felt regarding each statement on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency for the subscale was acceptable ($\alpha = 0.93$).

**Results**
A repeated measures MANCOVA, controlling for sex and highest level coached, was completed examining the CART-Q scores, between the control group and mental imagery group. The MANCOVA for the group by time interaction was not significant, as well as the ANCOVAs reported for each component ($p$s > .05). Means and standard deviations are shown in Table 6.

A 2 (group) x 2 (time) repeated measures MANCOVA, controlling for the sex and highest level coached, was conducted to analyze the coaches’ knowledge, attitudes, and confidence levels towards improving their communication. The MANCOVA for the group by time interaction was significant (Pillai’s trace = .06, $F_{(2,132)} = 2.69$, $p = .049$, $\eta^2_p = .06$). Follow-up repeated measures ANCOVAs revealed significant group by time interactions for confidence ($F_{(2,132)} = 5.8$, $p = .02$, $\eta^2_p = .04$). Attitudes and knowledge did not have significant interactions, $p > .05$. The paired-samples t-test demonstrated that there was a main effect for time for the imagery group, as confidence significantly decreased from pre to post intervention ($t_{(65)} = 1.50$, $p = .04$). The control group’s confidence did not show a main effect for time, $p > .05$, however they tended to have increased confidence following the intervention. Means and standard deviations are shown in Table 7.

The present study included a control group in which the participants attended a communication workshop to improve their communication with their athletes. There were no significant differences in terms of the CART-Q between the control group and the mental imagery group. The main communication-related findings were that the mental imagery group’s confidence in improving their communication with their athletes decreased from baseline to follow-up. Also, the communication group tended to have
more positive attitudes toward improving their communication with their athletes after the workshop. In conclusion, the workshop was not effective in improving the coaches’ relationship with their athletes; however, it did increase their confidence in improving their communication with their athletes.

Table 7. Pre and post means and standard deviations for Coach-Athlete Relationship Questionnaire.
Table 8. Pre and post means and standard deviations for coaches’ knowledge, attitudes, and confidence of improving communication for the control and mental imagery group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group</th>
<th></th>
<th>Mental Imagery Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Initial Commitment</td>
<td>5.51</td>
<td>.125</td>
<td>5.44</td>
<td>.125</td>
</tr>
<tr>
<td>Final Commitment</td>
<td>5.54</td>
<td>.116</td>
<td>5.41</td>
<td>.116</td>
</tr>
<tr>
<td>Initial Closeness</td>
<td>6.11</td>
<td>.091</td>
<td>6.17</td>
<td>.091</td>
</tr>
<tr>
<td>Final Closeness</td>
<td>5.99</td>
<td>.082</td>
<td>6.05</td>
<td>.098</td>
</tr>
<tr>
<td>Initial Complementarity</td>
<td>5.99</td>
<td>.088</td>
<td>6.04</td>
<td>.088</td>
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<tr>
<td>Final Complementarity</td>
<td>5.97</td>
<td>.100</td>
<td>5.86</td>
<td>.100</td>
</tr>
</tbody>
</table>

Notes. All rated on a 7-point scale.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group</th>
<th>Mental Imagery Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Σ</td>
<td>SD</td>
</tr>
<tr>
<td>Initial Knowledge (/21)</td>
<td>16.3</td>
<td>.470</td>
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<td>Final Knowledge (/21)</td>
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<td>20.5</td>
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<tr>
<td>Final Confidence (/30)</td>
<td>21.2</td>
<td>.736</td>
</tr>
</tbody>
</table>

Notes. * p < .05. Knowledge and attitudes were rated on a 7-point scale. Confidence was rated on a 10-point scale.
4.1 Summary of Findings

The present study examined whether a mental imagery workshop was an effective method for increasing coaches’ encouragement of imagery among their athletes. This study demonstrated that the mental imagery group’s confidence significantly increased from baseline to follow-up, whereas the control groups’ confidence remained stable. The mental imagery group also tended to have more positive attitudes following the intervention while the control group’s attitudes tended to remain unchanged. However, the imagery workshop did not increase coaches’ encouragement of the five functions of mental imagery among their athletes. Interestingly, all coaches over the course of the study increased their encouragement of imagery for two specific situations: outside of practice and before bed.

4.2 Study Strengths

Contributions to Imagery Research

To our knowledge this study is the first study to provide coaches with a workshop specifically teaching them about mental imagery. It is also the first intervention study promoting imagery encouragement among recreational sport coaches. Given the novelty of this study, the study findings contribute to imagery research in three ways: 1) recreational sport coaches do think using imagery is important, 2) a single workshop was not effective to change behaviour and 3) these coaches increased their encouragement of certain types of imagery in a couple different situations.

It has provided some assistance in understanding that recreational sport coaches do think that using mental imagery with their athletes can be beneficial, demonstrated by the responses of 61% of the coaches in this study. Also, the fact that recreational athletes
use less imagery than elite athletes may not be due to the coaches’ beliefs that using imagery is important. This is an important step for gaining perspective into why recreational athletes do not use imagery often. Eliminating possible explanations for why they are not using imagery will help to determine possible avenues to target to increase athletes’ imagery use.

This study also indicated that coaches need more information than was given in this single workshop to increase their encouragement of imagery, even though their confidence increased. Coaches’ confidence towards encouraging mental imagery may also be easier to change than their knowledge and attitudes. In order to change knowledge and attitudes, more information and the benefits associated with using mental imagery may need to be emphasized. Also, giving examples of successful uses of mental imagery in sport could be helpful. Increasing knowledge and attitudes may aid in the coaches’ encouraging their athletes to use imagery more frequently. This can be supported because there were significant positive relationships between the measures from the CEAIUQ and coaches’ attitudes, knowledge, and confidence. Therefore by increasing coaches’ knowledge and attitudes a resultant increase in imagery encouragement may occur as well.

It is also interesting to consider the fact that all coaches increased their encouragement of imagery outside of practice and before bed. After reading the questionnaires and being exposed to different areas in which imagery can be used, these coaches may have realized more situations in which they could encourage imagery. These coaches may have thought that encouraging imagery and going through sessions at
practice would not be beneficial but having the athletes partake in imagery on their own
time could provide performance benefits without taking time from practice.

Similarly, coaches who had previously coached at higher levels might have thought using cognitive specific and motivational specific imagery would be the most beneficial. This may be because recreational coaches who do encourage imagery, most frequently encourage cognitive specific imagery to learn skills (Jedlic et al., 2007). However, coaches who have previously coached at higher levels would have previously coached with a focus not only on skill development. Therefore, after exposure to the questionnaires, these coaches who have coached at higher levels may have started to encourage imagery to learn strategies as well as to accomplish specific goals.

**Contributions to Coaching Research**

The study findings are important because presently there are not any coach training programs for community level coaches that teach them about psychological skills. By expanding the workshop delivered in the present study to include multiple workshops, coaches may be provided with valuable information that they do not receive from programs such as the NCCP in Canada.

As sport psychologists have come to recognize the importance of positive youth development, it is important to consider the people who have an influence on young athletes’ lives and to ensure that the athletes are all receiving the best sport experience possible. Targeting the coaches and providing them with valuable information will ultimately benefit the athletes. This study can provide some initial insight into how a workshop program can be tailored to the coaches to improve and increase their knowledge and coaching techniques.
This study demonstrated that regardless of the content of the workshops, the coaches’ confidence levels increased. The fact that their confidence increased without any behaviour change, can aid in the creation of future workshops to determine what was missing in this study. The content of the workshops seem to be significant enough to allow the coaches to feel more confident in their ability to encourage their athletes to use imagery.

This study was beneficial in terms of increasing coaches’ confidence levels but also an interesting observation was made while recruiting for this study. Many recreational sport league coaches were approached and asked to participate. These included hockey, basketball, volleyball, and ringette leagues. The majority of coaches who actually participated in this study were hockey coaches. The large participation by hockey coaches compared to ringette coaches, for example, may suggest that hockey coaches thought that learning skills to improve their interactions with their athletes was more important, tending them to want to attend a workshop more than other sport coaches.

4.3 Study Limitations

Despite the potential contributions of this study, there are several areas necessitating substantial future research because this is the first study of its kind.

Firstly, there may have been some problems with the workshop and how it was taught. It may not have been taught in a way to help all those individuals who learn in different ways, and may not have provided enough information for the coaches to actually feel comfortable in encouraging their athletes to use imagery. More focus on the benefits of imagery may have been useful to ensure all coaches really understood how it
could benefit their athletes’ lives. Having the coaches fully realize the benefits associated with using imagery may have increased their encouragement of imagery. The variability in coaches’ experiences and reasons for coaching (as opposed to higher level coaches who may all have similar reasons for coaching), may be a factor influencing how much interest or value they put on using mental imagery.

The workshops also were all conducted by the same researcher and this researcher was also the person distributing the questionnaires at the workshop. This could have lead to some desirability bias in that the participants may have answered differently by being in the presence of the researcher. Participants often do not accurately report data when in the presence of the researcher for ego-defensive or impression management reasons. This causes the results to be systematically biased toward the participants perceptions of what is correct and expected by the researcher (Fisher, 1993).

An obvious limitation of this study was that the data were only gathered by asking for the perception of the coaches. The athletes’ perception was not sought. Also, it is unknown why the coaches were coaching these recreational sports teams. This information would have provided valuable added information. It also is unknown at what point of the season it was for these coaches. Coaches at the end of the season entering playoffs may have been less likely to introduce skills compared to coaches just beginning their season. The intervention period lasted only 4 weeks. Depending on the point in the season, there may not have been enough time for coaches to incorporate imagery into their athletes’ training. Other aspects of the sport may have had high priority leaving minimal time to add in psychological skills training.
This study also involved coaches of recreational sports with athletes between the ages of 13 and 18. This age range may have been too large. Athletes between the ages of 16 and 18 may have been participating in recreational sport for different reasons than the younger athletes. Coaches of each age group may also coach these athletes differently depending on their age.

These coaches were also all very busy people and thus randomization could not occur. Coaches were placed in a workshop based on their availability. This lack of pure randomization could have lead to bias, for example coaches from the same league may have been more likely to be available on the same night. It may have been possible that coaches who knew each other attended different workshops and could have shared information or notes with other coaches.

4.4 Future Directions

This study has created many avenues for future research. Firstly, determining the optimal workshop content should be a priority. It is necessary to establish what exactly should be taught to the coaches and the best method for doing so. Conducting a series of workshops and determining whether more exposure to these new psychological skills can lead to increased encouragement of mental imagery would be helpful. Having a series of workshops with differing content to compare and contrast could provide added information. For example, one workshop could be focused on really ensuring the coaches understand the benefits of imagery, whereas another workshop could focus on having the coaches participate in teaching imagery. Combining these workshops as well as comparing and contrasting them could provide added information as to what coaches need to increase their encouragement.
Qualitative interviews with recreational coaches would further the knowledge in the area by providing insight into what they are thinking about imagery use. Understanding how much information and experience with mental imagery that they need before implementing it with their athletes is crucial. The dose-response relationship could be examined by testing workshops of various lengths. It is necessary to determine whether a workshop for coaches is an effective means for learning or whether another setting, such as at coach-athlete meetings, may be more helpful. Gaining insight into their past experiences with sport, how this affects their coaching style, and their own use of mental imagery also would provide valuable information.

Also, including the athletes, and asking them whether their coaches actually encouraged imagery to a higher degree after the workshop would validate the answers from the coaches. The athletes could also provide valuable insight into whether the coaches’ encouragement of imagery actually caused them to increase their own use of imagery. Including the athletes’ opinions are really important because if the coaches increase their encouragement of imagery it does not matter unless the athletes are actually using imagery as well.

4.5 Conclusion

This study should serve as an initial framework for creating future workshop studies. Findings can contribute to imagery research by reinforcing that coaches do feel that encouraging recreational athletes to use imagery can lead to improvements in all areas of their life, not specifically just in sports. This study also demonstrated how a single workshop can lead to increases in confidence levels. Imagery research should continue to be done with recreational coaches to ensure they can provide their athletes
with encouragement to use imagery. More research needs to be done to convince coaches of the value of psychological skills for their recreational athletes. These athletes should not be segregated from learning this beneficial psychological skill that can lead to many positive performance and life changes.
References


Appendix

Appendix A: Recruitment Materials, Letter of Information/Consent Form

Recruitment Materials

Coach E-mail

Dear Coach,

I am writing to invite you to participate in a research project examining factors related to your interactions with your athletes. The ultimate goal of our research is to better understand coaches’ interactions with their athletes. This research is being conducted by Jaymi Edwards, a graduate student in the School of Kinesiology & Health Studies under the supervision of Dr. Amy Latimer, professor at Queen’s University, and Dr. Barbi Law, professor at Nipissing University. This research has been cleared by the Queen’s University General Research Ethics Board.

For this study, we are looking for coaches of recreational team sports. Your participation would involve completing two questionnaire packages twice (4 weeks apart) and attending an hour and a half workshop. The first questionnaire package would be completed at the workshop, and the second package would be completed online. Each questionnaire package will take approximately 20 minutes to complete. The questionnaires will be completely confidential and there are no known risks associated with participation in this study.

Participation in this study will not interfere with your regular training or competition schedules. We hope you are able to help us and participate in this study. If you would like to participate please respond to this e-mail. I will then send you a schedule of available workshop times so that you can choose a time that is convenient for you to attend. Your help would be greatly appreciated.

If you have further questions, please contact the primary researcher, Jaymi Edwards (4je1@queensu.ca), Dr. Amy Latimer (amy.latimer@queensu.ca), 613.533.6000 ext. 78773, or Dr. Barbi Law, barbil@nipissingu.ca, (705) 474-3450 ext. 4147.

Thank you for your time and consideration,

Jaymi Edwards, (M.A. Student)
Would you like to participate in a study to potentially benefit your interactions with you athletes?

- **Involves completing 2 questionnaire packages (Approx. 20 minutes each) 4 weeks apart and**

- **Attending a one and a half hour workshop**

Research is being conducted by Jaymi Edwards, a graduate student, in the School of Kinesiology and Health Studies at Queen’s University

If interested, for more information, or if you have any questions please e-mail Jaymi at 4je1@queensu.ca
Letter of Information/Consent Form

Coaches’ Interactions with Athletes

This project is about factors related to your interactions with your athletes. The research is being conducted by Jaymi Edwards, a graduate student, with supervision by Dr. Amy Latimer, professor in the School of Kinesiology & Health Studies at Queen’s University and Dr. Barbi Law, professor in the School of Physical and Health Education at Nipissing University. This research has been cleared by the Queen's University General Research Ethics Board in accordance with Canadian ethics standards.

The project will involve completing two questionnaire packages and attending a workshop. The first questionnaire package will contain questions related to your demographic information, sport coaching experience and interactions with your athletes. The second questionnaire package will be completed 4 weeks later and will involve answering more questions about your interactions with your athletes. Responses to questions will involve writing short answers, checking tick boxes, and rating statements on a scale. Each package will take approximately ten minutes to complete. The workshop will last about 1.5 hours and the first questionnaire package will be completed before the workshop.

There are no known risks to participation in the study. A potential benefit is that you may become aware of possible techniques that you can use in your coaching to improve your teams’ performance. Participation in this study is voluntary and you are free to withdraw at any time. You are also not obliged to answer any questions which you find objectionable or which make you feel uncomfortable. Data will be gathered through questionnaires and only the researchers and their supervisors will have access to the data. Anonymity will be protected by asking you to create a unique identifying code and having you record the code and no other identifying information on your questionnaire. The questionnaires will be stored in a filing cabinet in a locked office to ensure the confidentiality of the whole study. The results will be presented in a group format to prevent any individual’s data from being made known. The data may also be used in academic presentations and publications resulting from this study.

Your completion of the questionnaire indicates your consent to participate in this study. If you have any questions, comments, concerns, or want to obtain a copy of the results, please contact Jaymi Edwards, 4je1@queensu.ca, the project supervisor, Dr. Amy Latimer, amy.latimer@queensu.ca (613)533-6000 ext. 78773, Dr. Barbi Law, barbil@nipissingu.ca, (705) 474-3450 ext. 4147, Dr. Jean Cote, Director of the School of Kinesiology and Health Studies, SKHS.Director@queensu.ca, (613) 533-6601, or the Chair of the General Research Ethics Board, Dr. Joan Stevenson, (613) 533-6081, email: chair.GREB@queensu.ca.
Appendix B: Questionnaires, Handouts

Pre-Intervention Questionnaire

In order for us to create a unique identifier code for you that will appear on your data in place of your name please provide the following details:

Provide the day and month of your birthday: Day:_______ Month:_______

What are the last four digits of your home telephone number:

**Instructions:** Please complete the following questionnaire by filling in the blanks or ticking the appropriate box for each of the questions below. Thank you for your participation!

I: Demographic Information

Are you female or male?

- [ ] Female
- [ ] Male

Current Age: _______years

II: Sport Information

Sport Coached: _______________________________

Gender of Athletes Coached:

- [ ] Male
- [ ] Female
- [ ] Male & Female

Age Range of Athletes: _________________

Number of years coaching this sport (including this year):

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4 +

Highest Level Coached:
III: Sport Psychology Experience

Have you ever received any sport psychology training or attended any programs teaching sport psychology skills (i.e. NCCP)?

☐ Yes  ☐ No

If so, what type of training have you received?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Have you completed the NCCP Level 1?

☐ Yes  ☐ No

If so, in what sport did you complete it in?
_______________________________________________

Have you taught any psychological skills to your athletes? (ex. Goal setting, Imagery, Self-Talk)

☐ Yes  ☐ No

Check the skills below that you taught?

☐ Goal Setting (Setting a specific goal and working towards achieving it)

☐ Self-Talk (Statements said to yourself whether out loud or in your head)

☐ Imagery (Visualizing/feeling without actually experiencing the real thing)

☐ Arousal Regulation (Techniques to reduce/increase your arousal & anxiety levels)

☐ Attention Control (Techniques to help you focus/cope with distractions)
Performance routines (Things you always do to prepare yourself; can be before, during, or after competition and practice for example)

Other:__________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

How often do you teach these skills per week? _____________________

☐ 1-2
☐ 3-4
☐ 5-6
☐ 7+

IV: Coaches’ Interactions with Athletes

Mental imagery is an experience that imitates a real experience, and that we can be conscious of ‘seeing’ an image of smell, tastes, or sounds without actually experiencing the real thing (White & Hardy, 1998). This questionnaire was designed to assess the extent to which you as a coach encourage your athletes to use imagery. Please answer the questions with respect to the sport you currently are coaching. Ratings will be made on a seven-point scale, where 1 represents that you rarely encourage your athletes to use imagery and 7 represents that you often encourage your athletes to use imagery. Statements that fall between these two extremes should be rated accordingly along the rest of the scale. Use the stem provided below to precede each of the statements then fill in the blank with the appropriate number from the scale provided to indicate the degree to which the statement applies to you. Remember, there are no right or wrong answers, so please answer as accurately as possible.

<table>
<thead>
<tr>
<th>When in season, I encourage my athletes …</th>
<th>Rarely</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>to use imagery in practice.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

1.________
2. to use imagery outside of practice (e.g., at home). ____
3. to use imagery in conjunction with competition. _____
4. to use imagery when injured. ____
5. to use imagery post-competition.____
6. to use imagery just before competing. _____
7. to use imagery just before going to bed. ______

When in season, I encourage my athletes …

<table>
<thead>
<tr>
<th>Rarely</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

8. to make up new plans/strategies in their heads. _____
9. to image the atmosphere of winning a championship (e.g., the excitement that follows winning a championship). _____
10. to image giving 100%. ______
11. to consistently control the image of a physical skill. _____
12. to imagine the emotions they feel while doing their sport. ______
13. to imagine the excitement that follows winning an event. ______
14. to image alternative strategies in case their event/game plan fails. _____
15. to imagine handling the arousal and excitement associated with their sport. _____
16. to imagine appearing self-confident in front of opponents. ______
17. to imagine other athletes congratulating them on a good performance. _____
18. to image each section of an event/game (e.g., offense vs. defense, fast vs. slow). ____
19. to imagine being in control in difficult situations. _____
20. to change an image of a skill when appropriate. _____
21. to image others applauding their performance. ______
22. to consistently perform a skill perfectly in their mind when imaging it. ______
23. to image winning a medal. ______
24. to imagine the stress and anxiety associated with their sport. _____
25. to image continuing with their game/event plan, even when performing poorly. _____
26. to feel themselves getting psyched up when imagining performing. _____
27. to mentally make corrections to physical skills. _____
28. to imagine executing entire plays/programs/sections just the way they want them to happen in an event/game. _____
29. to imagine performing a skill perfectly just before attempting it. _____
30. to imagine being mentally tough. _____
31. to feel relaxed when imagining themselves participating in their sport. _____
32. to imagine the excitement associated with performing. _____
33. to image being interviewed as a champion. _____
34. to image being focussed during a challenging situation. _____
35. to imagine performing a new skill perfectly when learning it. _____
36. to imagine successfully following their game/event plan. _____
37. to image working successfully through tough situations (e.g., a player short, sore ankle, etc.). _____

<table>
<thead>
<tr>
<th>Rate the following on this scale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
</tr>
<tr>
<td>Rarely</td>
</tr>
<tr>
<td>1  2  3  4  5  6  7</td>
</tr>
</tbody>
</table>

1. I feel close to my athletes. _____
2. I feel committed to my athletes. _____
3. I feel that my sport career is promising with my athletes. _____
4. I like my athletes. _____
5. I trust my athletes. _____
6. I respect my athletes. _____
7. I feel appreciation for the sacrifices my athletes have experienced in order to improve their performances. _____
8. When I coach my athletes I feel at ease. _____
9. When I coach my athletes I feel responsive to their efforts. _____
10. When I coach my athletes I am ready to do my best. _____
11. When I coach my athletes I adopt a friendly stance. _____
Rate the following on this scale:

<table>
<thead>
<tr>
<th>Not At All Confident</th>
<th>Completely Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
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<td>9</td>
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<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

1. I feel confident in my ability to teach my athletes mental imagery. 
2. I feel confident in my ability to plan a mental imagery session. 
3. I feel confident in my ability to explain why mental imagery is beneficial. 
4. I feel confident in my ability to improve my communication with my athletes. 
5. I feel confident in my ability to plan a way to improve communication with my athletes. 
6. I feel confident in my ability to explain why effective communication is beneficial. 

Rate the following on this scale:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>2</td>
<td>3</td>
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<tr>
<td>3</td>
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<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

7. I feel like I have the necessary information to teach my athletes mental imagery. 
8. I feel like I have the necessary tools to teach my athletes mental imagery. 
9. I can see the benefits of using mental imagery with my athletes. 
10. I feel like I have the necessary information to improve my communication with my athletes. 
11. I feel like I have the necessary tools to improve my communication with my athletes. 
12. I can see the benefits of improving my communication with my athletes. 

Circle your choice. On a scale from 1-7, I think that teaching mental imagery to my athletes is:

<table>
<thead>
<tr>
<th>Boring</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Interesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unenjoyable</td>
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<td>4</td>
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<td>Enjoyable</td>
</tr>
<tr>
<td>Unpleasant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Pleasant</td>
</tr>
<tr>
<td>Harmful</td>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Beneficial</td>
</tr>
<tr>
<td>Worthless</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Valuable</td>
</tr>
<tr>
<td>Not fun</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Fun</td>
</tr>
</tbody>
</table>

93
On a scale from 1-7, I think that improving my communication with my athlete is:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
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<tr>
<td>Boring</td>
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<td></td>
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</tr>
<tr>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<td>7</td>
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<tr>
<td>Unpleasant</td>
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<td>4</td>
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<td>7</td>
</tr>
<tr>
<td>Harmful</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Worthless</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Not fun</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Interesting</td>
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<td>Enjoyable</td>
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<tr>
<td>Pleasant</td>
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</tr>
<tr>
<td>Beneficial</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Valuable</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Fun</td>
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<td></td>
</tr>
</tbody>
</table>

Thank you so much for participating!
Post-Intervention Questionnaire

To ensure that we can create correctly match this questionnaire to the questionnaire you previously filled out please provide the following details:

Provide the day and month of your birthday:  Day:_______    Month:_______

What are the last four digits of your home telephone number:

**Instructions:** Please complete the following questionnaire by filling in the blanks or ticking the appropriate box for each of the questions below. Thank you for your participation!

Coaches’ Interactions with Athletes

Please answer the questions with respect to the sport you currently are coaching. Ratings will be made on a seven-point scale, where 1 represents that you rarely encourage your athletes to use imagery and 7 represents that you often encourage your athletes to use imagery. Statements that fall between these two extremes should be rated accordingly along the rest of the scale. Use the stem provided below to precede each of the statements then fill in the blank with the appropriate number from the scale provided to indicate the degree to which the statement applies to you. Remember, there are no right or wrong answers, so please answer as accurately as possible.

<table>
<thead>
<tr>
<th>When in season, I encourage my athletes …</th>
<th>Rarely</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. to use imagery in practice. _____</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2. to use imagery outside of practice (e.g., at home). _____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. to use imagery in conjunction with competition. _____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. to use imagery when injured. _____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. to use imagery post-competition. _____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. to use imagery just before competing. _____</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. to use imagery just before going to bed. _____

<table>
<thead>
<tr>
<th>When in season, I encourage my athletes …</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

1. to make up new plans/strategies in their heads.  
2. to image the atmosphere of winning a championship (e.g., the excitement that follows winning a championship). _____  
3. to image giving 100%. _____  
4. to consistently control the image of a physical skill. _____  
5. to imagine the emotions they feel while doing their sport. _____  
6. to imagine the excitement that follows winning an event. _____  
7. to image alternative strategies in case their event/game plan fails. _____  
8. to imagine handling the arousal and excitement associated with their sport. ___  
9. to imagine appearing self-confident in front of opponents. _____  
10. to imagine other athletes congratulating them on a good performance. _____  
11. to image each section of an event/game (e.g., offense vs. defence, fast vs. slow). _____  
12. to imagine being in control in difficult situations. _____  
13. to change an image of a skill when appropriate. _____  
14. to image others applauding their performance. _____  
15. to consistently perform a skill perfectly in their mind when imaging it. _____  
16. to image winning a medal. _____  
17. to imagine the stress and anxiety associated with their sport. _____  
18. to image continuing with their game/event plan, even when performing poorly. _____  
19. to feel themselves getting psyched up when imagining performing. _____  
20. to mentally make corrections to physical skills. _____  
21. to imagine executing entire plays/programs/sections just the way they want them to happen in an event/game. _____  
22. to imagine performing a skill perfectly just before attempting it. _____
23. to imagine being mentally tough. _____
24. to feel relaxed when imagining themselves participating in their sport. _____
25. to imagine the excitement associated with performing. _____
26. to imagine being interviewed as a champion. _____
27. to imagine being focussed during a challenging situation. _____
28. to imagine performing a new skill perfectly when learning it. _____
29. to imagine successfully following their game/event plan. _____
30. to image working successfully through tough situations (e.g., a player short, sore ankle, etc.). _____

**Rate the following on this scale:**

<table>
<thead>
<tr>
<th>Rarely</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

1. I feel close to my athletes. _____
2. I feel committed to my athletes. _____
3. I feel that my sport career is promising with my athletes. _____
4. I like my athletes. _____
5. I trust my athletes. _____
6. I respect my athletes. _____
7. I feel appreciation for the sacrifices my athletes have experienced in order to improve their performances. _____
8. When I coach my athletes I feel at ease. _____
9. When I coach my athletes I feel responsive to their efforts. _____
10. When I coach my athletes I am ready to do my best. _____
11. When I coach my athletes I adopt a friendly stance. _____

**Rate the following on this scale:**

<table>
<thead>
<tr>
<th>Not At All Confident</th>
<th>Completely Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

13. I feel confident in my ability to teach my athletes mental imagery. ______
14. I feel confident in my ability to plan a mental imagery session. ______
15. I feel confident in my ability to explain why mental imagery is beneficial. ______
16. I feel confident in my ability to improve my communication with my athletes. ______

17. I feel confident in my ability to plan a way to improve communication with my athletes. ______

18. I feel confident in my ability to explain why effective communication is beneficial. ______

<table>
<thead>
<tr>
<th>Rate the following on this scale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

19. I feel like I have the necessary information to teach my athletes mental imagery. ______

20. I feel like I have the necessary tools to teach my athletes mental imagery. ______

21. I can see the benefits of using mental imagery with my athletes. ______

22. I feel like I have the necessary information to improve my communication with my athletes. ______

23. I feel like I have the necessary tools to improve my communication with my athletes. ______

24. I can see the benefits of improving my communication with my athletes. ______

Circle your choice. On a scale from 1-7, I think that teaching mental imagery to my athletes is:

<table>
<thead>
<tr>
<th>Boring</th>
<th>Unenjoyable</th>
<th>Unpleasant</th>
<th>Harmful</th>
<th>Worthless</th>
<th>Not fun</th>
<th>Interesting</th>
<th>Enjoyable</th>
<th>Pleasant</th>
<th>Beneficial</th>
<th>Valuable</th>
<th>Fun</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<td>7</td>
<td>7</td>
<td>7</td>
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<td></td>
</tr>
</tbody>
</table>

On a scale from 1-7, I think that improving my communication with my athlete is:

<table>
<thead>
<tr>
<th>Boring</th>
<th>Unenjoyable</th>
<th>Unpleasant</th>
<th>Harmful</th>
<th>Worthless</th>
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<th>Beneficial</th>
<th>Valuable</th>
<th>Fun</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
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<td>6</td>
<td>7</td>
<td>7</td>
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<td></td>
</tr>
</tbody>
</table>

Thank you so much for participating!
Handouts

Communication Information

What is Communication?
- Process of transferring information from one entity to another
- The exchange of thoughts, messages, or the like, as by speech, signals or writing.
- To express oneself in such a way that one is readily and clearly understood.

Benefits of Effectively Communicating
- Increase team practicing
- Builds respect with athletes
- Reduce stress and confusion
- Better understand what others are saying
- Better understand how to get your message across to your athletes
- Enhance coach-athlete relationships
- Save time
- Modeling good communication strategies

Methods of Communication
- Spoken Words
- Written Words
- Visual Images
- Body Language

Barriers to Communicating with Athletes
- Noise
- Distractions
- Assumptions
- Emotions
- Poor listening skills
- Language Differences

Before Communicating Consider...
- WHY you want to communicate
- WHO you wish to communicate with
- WHERE and WHEN the message could best be delivered
- WHAT is it that you want to communicate
- HOW you are going to communicate the information

Coaching Communication Styles
- Autocratic
- Democratic
- Delegative
6 C’s of Effective Communication

- **Clear** - Ensure that the information is presented clearly
- **Concise** - Do not lose the message by being long winded
- **Correct** - Be accurate
- **Complete** - Give all the information and not just part of it
- **Courteous** - Be polite and non-threatening
- **Constructive** - Be positive, avoid being critical and negative

Tips for Effectively Communicating with Athletes

- Separate fact from opinion
- Focus on one thing at a time
- Be consistent with nonverbal messages (expressions, body language, gestures)
- Reinforce with repetition
- Make the messages appropriate to the receiver’s level of understanding
- Look for feedback that your message was received accurately

What if…?

- You are not aware of your own coaching style
  - Ask a family member, or friend to watch you coach
  - Ask athletes their opinions of your coaching
- Athletes on your team respond best to different communication styles
  - Determine each athletes individual needs
- Misunderstandings occur
  - Address problems immediately
Mental Imagery

What is Mental Imagery?
“…An experience that mimics real experience. We can be aware of ‘seeing’ an image, feeling movements as an image, or experiencing an image of smell, tastes, or sounds without actually experiencing the real thing…It differs from dreams in that we are awake and conscious when we form an image” (White & Hardy, 1998, p. 389).

Benefits of Using Mental Imagery
- Increased self-confidence
- Increase in ability to control arousal and anxiety levels
- Increase in motivation
- Skill development and learning strategies
- Increases injury rehabilitation process

Use All Senses:
- Visual, Kinesthetic, Auditory, Tactile, Olfactory

Perspective:
- Internal
  See self perform through own eyes
- External
  • Third person view of self

Two Important Factors:
- Vividness - Ability to create realistic images
- Controllability - Ability to change images

Imagery is A Skill - Practicing imagery is necessary just as one would practice any physical skill

Applied Model of Mental Imagery

Where
- Sport Situation (training, competition, injury)
- When

Imagery Function (cognitive or motivational)

Outcome (learning skills & strategies, changing thoughts, regulating arousal & anxiety)

Imagery Ability
### Imagery Functions

<table>
<thead>
<tr>
<th>Cognitive Specific</th>
<th>Cognitive General</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
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<th>Motivational General</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Mastery</td>
</tr>
<tr>
<td></td>
<td>• Arousal</td>
</tr>
</tbody>
</table>

### Tips for Implementing Imagery with Athletes

- Ensure they understand the purpose and benefits from using imagery
- Make sure they are attempting to use all of their senses
- Must be practiced like any physical skill
- Practice for 15 minutes a day

**What if...?**

- **Athlete is having trouble creating an image? Controlling the image? Resisting doing imagery?**
  - Have athlete visualize single objects first (i.e., a ball), and expand from there
  - Aids to Imagery
  - Verbal imagery cues - tell them to focus on being successful
  - Clearly explain benefits
Appendix C: Debriefing Form

Thank you so much for participating in this study. The purpose of the study was to determine if a mental imagery workshop could be effective in increasing coaches’ encouragement of mental imagery towards their athletes. There was an added coach-athlete relationship questionnaire to disguise the nature of this study.

In order to ascertain whether mental imagery workshop attendance resulted in greater encouragement with athletes, we randomly assigned each coach to one of two types of workshops: 1) a workshop on mental imagery, or 2) a workshop on general communication with athletes. The coaches attending the general communication workshop were part of our control group because the encouragement of mental imagery to their athletes should not have increased. This allows us to compare results of the questionnaires completed four weeks after the workshops.

For those coaches who were in the control group and attended the general communication workshop, I will run the mental imagery workshops several more times if you would like to attend it. Please e-mail me if you are interested and I will let you know the available times. Also, if you would be interested in receiving a copy of the results of this study please contact Jaymi Edwards, 4je1@queensu.ca.

Thank you again for your participation. If you have any questions, comments, or concerns, please contact Jaymi Edwards, 4je1@queensu.ca, the project supervisor, Dr. Amy Latimer, amy.latimer@queensu.ca (613)533-6000 ext. 78773, Dr. Barbi Law, barbil@nipissingu.ca, (705) 474-3450 ext. 4147, Dr. Jean Cote, Director of the School of Kinesiology and Health Studies, SKHS.Director@queensu.ca, (613) 533-6601, or the Chair of the General Research Ethics Board, Dr. Joan Stevenson, (613) 533-6081, chair.GREB@queensu.ca.