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An Examination of Children's Active Play Imagery

Danielle C. Tobin, *The University of Western Ontario*

Supervisor: Dr. Craig Hall, *The University of Western Ontario*

A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Kinesiology

An Examination of Children's Active Play Imagery

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by

Danielle C. Tobin

Graduate Program in Kinesiology

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The School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

ABSTRACT

The general purpose of this dissertation was to examine children's active play imagery using Self-Determination Theory (Deci & Ryan, 2002) as a theoretical basis. The research was comprised of three studies. Study 1examined how the three types of active play imagery (i.e., fun, capability, and social) were associated with the three basic psychological needs (i.e., autonomy, competence, and relatedness). A total of 253 children aged 7-14 years old completed both the Children's Active Play Imagery Questionnaire (Cooke et al., 2014) and the Basic Need Satisfaction in Physical Activity (Gray et al., 2009). Capability imagery was found to be positively associated with competence, social imagery was positively associated with relatedness, and fun imagery was positively associated with competence. These findings provided valuable information for Study 2.

Study 2 investigated whether a 6-week imagery intervention could increase active play levels in children 9-11 years old. The study revealed the participants in the imagery group were able to maintain their active play levels (measured by pedometers) throughout the intervention, while the control group significantly decreased their active play levels from baseline to post-intervention. These findings provided support for continuing to pursue this avenue of research and informed Study 3.

Study 3 expanded upon Study 2's intervention by lengthening the intervention to 18 weeks, having individualized imagery scripts for the participants, and using accelerometers to measure active play. A case study was conducted with two 11 year olds. The results revealed that participant 2 was able to increase her active play levels from baseline to intervention, and maintained those levels in post-intervention. Challenges were seen in regards to wear time for participant 3; however, her subjective measure of active play followed the same pattern as participant 2. The overall findings from this dissertation established that imagery can be a promising avenue for increasing children's active play levels.

Keywords: Active Play, Self-determination theory, Imagery, Children

CO-AUTHORSHIP STATEMENT

This dissertation contains my original work. However, I would like to acknowledge my co-authors on this research project. I would like to acknowledge my supervisor Dr. Craig Hall for his contribution to all three of my studies. Dr. Krista Munroe-Chandler and Michelle Guerrero, both from the University of Windsor for their help and support throughout Study 1 and Study 2. In addition, I would like to acknowledge Dr. Lisa Cooke and Celina Shirazipour (now at Queens University) for their help with data collection for Study 1. I would like to also acknowledge Dr. Alan Edmunds for this help on Study 3.

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INTRODUCTION

We are in a society of convenience and oftentimes physical activity (PA) can be seen as an inconvenience in people's schedules and is often forgotten. As an example, Canadian children are less likely to partake in active transportation (i.e., walking) if their parents believe driving them will save time (Faulkner, Richichi, Buliung, Fusco, & Moola, 2010). Daily PA is important for children and provides various benefits such as motor development, academic performance, enhanced self-esteem, and enhanced cognitive functioning (Active Healthy Kids Canada, 2014; Biddle & Asare, 2011). Although the benefits of regular PA are known, only 9% of 5-11 year olds and 4% of 12-17 year old Canadian children and youth meet the guidelines of 60 minutes of daily PA (ParticipACTION, 2015). Given these statistics it is easy to understand why 20% of Canadian school-aged children are overweight with an additional 12% being obese (Janssen, 2013). These numbers are alarming and should provide a push towards finding ways to increase PA in Canadian children.

Children can participate in PA in various ways. For example, they can play organized sports which would be considered structured PA, or participate in less structured games (e.g., playing tag, walking), which would be unstructured PA. A specific type of unstructured PA is active play. Active play is defined as "unstructured PA that takes place outdoors during a child's free time" (Veitch, Salmon, & Ball, 2008, p. 870). Active play can contribute to the physical and psychological health of a child. In addition, active play can provide benefits to a child's development which may not be gained through organized sports such as increasing creativity, resolving conflicts, and increasing informal social engagement (Ginsburg, 2007; Burdette & Whitaker, 2005). Furthermore, focusing on active play allows us to reach a larger number of kids, given that active play is a broader term compared to organized sport. Active play can include various activities such as walking to school, playing tag with friends, throwing a ball, etc. Active play provides an accessible and low-cost way for children to do PA. Given all the positives outcomes of active play, it's important to encourage new strategies that will promote this type of PA.

Imagery Research

Imagery refers to creating or recreating images in your mind (Vealey & Greenleaf, 2010) but it differs from a dream in that we are awake and conscious. Imagery research in sport stems from work by Paivio (1985) which states that imagery incorporates cognitive and motivational functions that work on either a general or specific level. The cognitive specific (CS) function represents images of specific skills (e.g., a slap shot in hockey), while the cognitive general (CG) function refers to images used to increase strategies (e.g., two on one play in hockey). The motivational specific (MS) function involves imaging individual goals (e.g., winning a race), while the motivational general (MG) function refers to imaging physiological arousal levels and emotions (e.g., getting psyched up before a game). Hall, Mack, Pavio, and Hausenblas (1998) divided the motivational general function into two separate categories: motivational general-arousal (MG-A) and motivational general-mastery (MG-M). MG-A includes imaging being relaxed or energized, while MG-M includes imaging pictures that are related to mastery, mental toughness, and self-confidence.

Previous research demonstrated that children will often use imagery to learn new skills (Weiss, 1991). Imagery research with children has predominately been done with athletes and has found young athletes use imagery for all five functions (CS, CG, MS, MG-A, & MG-M; Munroe-Chandler, Hall, Fishburne, & Strachan, 2007). In regards to cognitive imagery, athletes were found to use imagery for both the development and execution of skills, as well as the development and execution of strategies and routines (Munroe, Giacobbi, Hall, & Weinberg, 2000). Furthermore, MG-M imagery has been shown to be a significant predictor of self-confidence and self-efficacy in both recreational and competitive soccer players (Munroe-Chandler, Hall, & Fishburne, 2008). Research also demonstrated that children use imagery before and during competition, as well as during practice (Munroe-Chandler et al., 2007).

An example of early imagery research with children in sports examined if an imagery intervention could enhancement performance in table tennis (Li-Wei, Qi-Wei, Orlick, & Zitzelsberger, 1992). The participants were 7-10 year old players. The study revealed that the imagery intervention was able to increase their performance, with the increase predominately seen in the quality of the players' performances. More recently, O, Munroe-Chandler, Hall, and Hall (2014) examined whether an individualized MG-M imagery could increase self-efficacy in

youth squash players. The results showed an increase in the frequency of MG-M imagery use. Furthermore, an effect of the imagery intervention on self-efficacy was seen in a majority of the participants. The participants who had the highest relative increase in MG-M use throughout the intervention phase also increased their self-efficacy the most.

Hall (1995) was the first to propose that exercisers may be using imagery. He reasoned that exercisers may use imagery to increase their motivation because of its influence on confidence and outcomes. Following Hall's (1995) proposition, researchers investigated the nature of exercise imagery and developed a questionnaire to assess its use (Hausenblas, Hall, Rodgers, & Munroe, 1999). It was found that exercisers employed imagery frequently and imaged themselves exercising at various times (e.g., before going to bed, before/after exercising) and it was used frequently. Furthermore, the participants indicated using imagery for different reasons (e.g., learning technique/strategies, increasing their motivation, feeling good about themselves). Based on their findings, Hausenblas and colleagues (1999) created the Exercise Imagery Questionnaire which measured three types of exercise imagery, energy (e.g., When I imagine exercising, it keeps me going during the day), technique (e.g., I imagine form/body position), and appearance (e.g., I imagine becoming healthy by exercising) imagery. Research has shown that exercise imagery can increase adult's exercise self-efficacy (Cumming, 2008) as well as their intentions to exercise (Rodgers, Munroe, & Hall, 2002). In 2003, Giacobbi, Hausenblas, Fallon, and Hall, examined the content and function of mental images used by regular exercisers through grounded theory analytic methods. Their findings demonstrated that appearance related imagery was often used as motivation to participate and adhere to exercise.

Self-Determination Theory

Self-determination theory (SDT; Deci & Ryan, 2002), a theory of human motivation, portrays motivation on a continuum ranging from autonomous motives to controlling motives (see Figure 1 for an outline of the continuum). Autonomous motives consist of intrinsic motivation, and two forms of extrinsic motivation, integrated regulation and identified regulation. The autonomous motives are the more self-determined types of motivation. Intrinsic motivation is doing an activity out of pure enjoyment or interest. Intrinsic motivation is the most autonomous motivation, and is associated with persistence in doing a task, as well as greater psychological health and well-being (Deci & Ryan, 1985). Integrated regulation implies that the

behaviour is considered to be part of the self. Integrated regulation is the most autonomous form of extrinsic motivation, but is still seen as a form of extrinsic motivation given that its drive is to gain a personally important outcome (Deci & Ryan, 2002). Identified regulation is also seen as a more autonomous form of extrinsic motivation and involves doing something because it is inherently important. Autonomous motives results in more positive behavioural, cognitive, and psychological outcomes (Deci & Ryan, 2002). In regards to controlling motives, they include introjected regulation and external regulation. Introjected regulation involves doing something to avoid guilt or shame or to enhance your personal feeling of self-worth. External regulation, the least autonomous form of motivation, is doing something to earn an external reward or to avoid punishment (Deci & Ryan, 2002). At the end of the continuum we find amotivation, which implies a lack of intention to do any behaviour. (Deci & Ryan, 2002).

An important component of SDT is the concept that everyone has three basic psychological needs they attempt to satisfy: autonomy, competence, and relatedness. Autonomy refers to being the perceived origin or source of one's behaviour. Competence refers to feeling effective in one's interaction with the environment. Relatedness is having a sense of belonging and connection to other individuals (Deci & Ryan, 2002). SDT states that everyone regardless of age, gender, or culture has these basic needs and individuals strive for environments which will satisfy their needs. Environments that help to satisfy basic psychological needs aid in achieving intrinsic motivation (Deci & Ryan, 2000). Needs are essential for growth, integrity and wellness in any domain of human activity (Deci & Ryan, 2000).

Self-Determination Theory and Exercise

SDT has been a useful theoretical foundation for examining the relationship between exercise and motivation. Motivation plays a critical role in determining the continuance of long term exercise performance (Deci & Ryan, 2008). Wilson, Rodgers, Hall, and Gammage (2003) found that exercisers used imagery for different motivational purposes. Specifically, their results illustrated that more autonomous motives were associated with both appearance and technique imagery, while less autonomous motives were associated with only appearance imagery. That study provided preliminary evidence that imagery use reflects different types of motivation in adult exercisers**.** Wilson, Rodgers, Blanchard, and Gessell (2003) examined the relationship between basic psychological needs, exercise regulation, and motivational consequences. They

found that autonomy and competence were positively correlated with more autonomous exercise regulations. The autonomous exercise regulations were in turn positively associated with exercise behaviour, attitudes, and physical fitness. In addition, subsequent research examined the effectiveness of motivation in forecasting objectively moderate intensity exercise behaviour (Standage, Sebire, & Loney, 2008). Their results showed that autonomous motivation positively predicted moderate-intensity exercise bouts, which is important because individuals who exercise for intrinsic purposes are more likely to persist with such exercise behaviour (Ryan, Federick, Lepes Rubio, & Sheldon, 1997). These studies demonstrate the links that exist between autonomous motivation and exercise behaviours. Research presented above also suggests that SDT is a useful theoretical framework for examining the motivational foundations of exercise imagery.

In regards to research pertaining to SDT and PA in children, it mostly has been conducted in the physical education (PE) settings. Taylor, Ntoumanis, Standage, and Spray (2010) found that competence was the strongest predictor of intrinsic motivation. In addition, they found that children with higher satisfaction of competence had more effort in PE and higher intention of being physically active compared to those with lower competence. Furthermore, intrinsic motivation was the strongest predictor of effort, leisure-time physical activity, and intentions to exercise. More recently, Standage, Gillison, Ntoumanis, and Treasure (2012) found that autonomy and competence were positive predictors of autonomous motivation towards PE classes, and also found that autonomy and competence had positive indirect effects on autonomous motivation towards exercise. Their study revealed that there were motivational, behavioural and well-being advantages to being autonomously motivated in physical activity.

Active Play Imagery

Research has shown that imagery can increase young athletes' performances, as well as increase their confidence and self-efficacy. Perhaps imagery could also serve similar purposes for children in other PA settings, such as active play. Tobin, Nadalin, Munroe-Chandler, and Hall (2013) examined children's active play imagery through a qualitative study. Focus groups were conducted with children 7-14 years old and established that children do in fact use active play imagery and their use of imagery facilitates the satisfaction of the three basic psychological needs proposed by SDT. In terms of autonomy, children imaged themselves having fun and

playing their favorite activities. With respect to competence, the results indicated children imaged themselves being good at active play, as well as using imagery to increase their confidence by imaging themselves being better than they actually are. In regards to relatedness, the participants reported imaging themselves with other people such as friends, family members, and others (e.g., professional athletes). The study also established that participants used active play imagery at different times such as before, during, and after their active play. Following this qualitative research, Cooke, Munroe-Chandler, Hall, Tobin, and Guerrero (2014) developed a questionnaire measuring children's active play imagery use. They identified three main themes of physical activity correlates for children: fun, capability, and social. These three main themes corresponded to Tobin et al.'s (2013) findings on children's active play imagery. Cooke et al. (2014) further established items capturing the imagery generally employed by children in active play contexts: fun imagery (i.e., images associated with enjoyment and interest), capability imagery (i.e., imagery associated with feelings of competence), and social imagery (i.e., images associated with playing with others).

Purpose of Dissertation

Based on the aforementioned research presented, it is important to examine new strategies to promote children's PA levels. Research has demonstrated that imagery has both cognitive and motivational functions and can influence adults' motivation to exercise. Furthermore, research has established that children use imagery in active play settings. Perhaps active play imagery could help to increase children's motivation to be more physically active.

Accordingly, the present dissertation further examined how active play imagery can influence PA levels of children using SDT as the theoretical basis. The primary goal was to establish whether or not imagery could be used as a strategy to help to increase children's active play levels.

This area of research is very new with only one qualitative study exploring active play imagery (Tobin et al., 2013). That study established that children are using active play imagery and that they use it for reasons consistent with SDT. Given that that was the only study conducted to date, Study 1 of this dissertation further investigated the associations between active play imagery and the basic psychological needs. It considered how each of the three

active play imagery types (i.e., fun, capability, and social) was associated with each of the three basic psychological needs (i.e., autonomy, competence, and relatedness).

Study 2 examined how active play imagery could be used to help increase children's PA levels. It investigated whether a six week imagery intervention could increase children's active play levels. The findings from study 1 were used as a guide for creating the imagery scripts. The findings from Study 1 demonstrated which basic needs to incorporate in our imagery scripts. Study 2 allowed us to examine whether or not this type of intervention is feasible. This was the first study to run an active play imagery intervention with children.

Study 3 was another active play imagery intervention with children. Based on the findings from Study 2, a second intervention was conducted. The purpose of Study 3 was to examine if an 18 week imagery intervention would increase children's active play levels, and whether they would be maintained once the intervention was completed. Given the length of the study, a case study design was used.

The three studies in this dissertation are presented using the integrated-article format. Each study is written as its own manuscript and focuses on a specific research question. Given the integrate-article format, some of the information presented in the general introduction will be repeated within the different studies.

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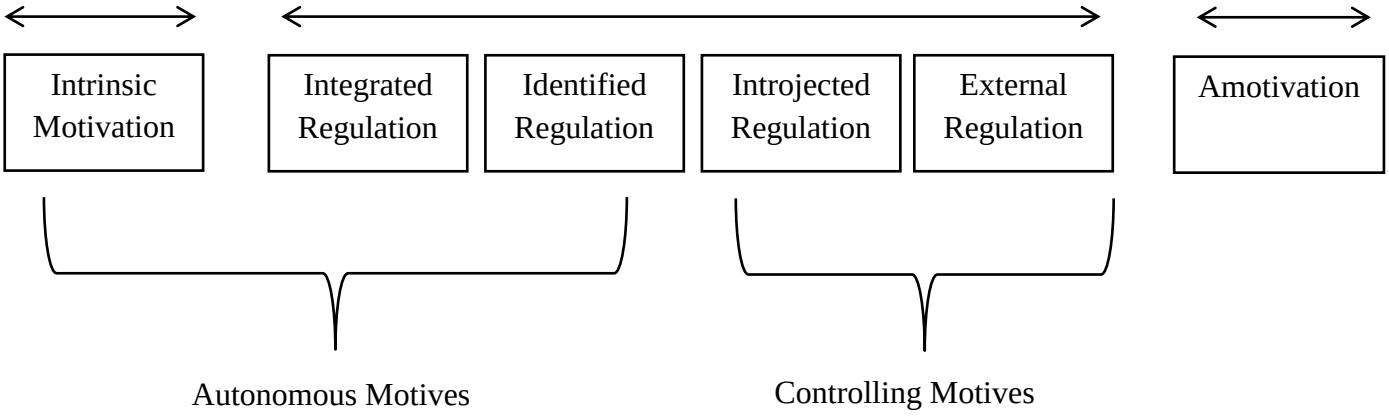

Figure 1 The Self-determination Theory continuum (Deci & Ryan, 2002)

STUDY 1

Examining the Relationship between Children's Active Play Imagery and Basic Psychological Needs[1]

For many years researchers have been interested in sport imagery. Imagery can be defined as an "experience that mimics real experiences. It differs from a dream in that we are awake and conscious when we form an image" (White & Hardy, 1998, p. 389). Imagery enables individuals to create or recreate experiences in their minds. Paivio (1985) established a conceptual framework for imagery use in sport which incorporates cognitive and motivation functions that operate at either a general or specific level. It is widely accepted that imagery use is effective for improving athletic performance (e.g., Hall, 2001), and that positive performance benefits can be obtained through the employment of mental imagery in sport. With respect to specific outcomes, imagery has been found to improve sport skills and strategies, enhance confidence and efficacy, and manage or reduce anxiety (cf., Munroe-Chandler & Morris, 2011)

Hall (1995) was the first to suggest that imagery is likely to have a motivating role in adult's exercise behavior, similar to its role in sport. Hausenblas, Hall, Rodgers, and Munroe (1999) further explored Hall's proposal by investigating the nature of exercise imagery and established that exercisers used imagery for both cognitive and motivational purposes. Based on their research, three types of exercise imagery were distinguished: technique, appearance, and energy. Technique imagery incorporates imaging proper exercise technique and steps. Appearance imagery includes imaging oneself as healthy and improving physical appearance. Finally, energy imagery includes images for energizing oneself or becoming psyched up (Hausenblas, et al., 1999). By employing imagery, exercisers can obtain a variety of outcomes including becoming energized, learning exercise tasks, setting appearance related goals, coping with exercise barriers, and increasing their self-efficacy (Gammage, Hall, & Rodgers, 2000; Giacobbi, Hausenblas, Fallon, & Hall, 2003; Hausenblas et al., 1999).

Given the motivational function of imagery, it is important to examine this function more in depth, using a well-established motivational framework. Self-Determination Theory (SDT; Deci & Ryan, 2002) is a popular framework that has been used to understand the motivational

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[1] A version of this paper has been accepted to the *International Journal of Sport and Exercise Psychology*

basis of exercise participation (Wilson & Rodgers, 2004; Hagger & Chatzisarantis, 2007; Wilson, Mack, & Grattan, 2008). SDT proposes that motivation lies on a continuum and can be intrinsic, extrinsic, or amotivated. Situated at one end of the continuum is amotivation, which refers to the lack or absence of motivation. At the opposite end of the continnum is intrinsic motivation, which is recognized as the most autonomous form of motivation. Extrinsic motivation lies between the extremes and varies in different levels of motivation, from the highly controlled motives (i.e., external regulation and introjected regulation) to more autonomous motives (i.e., identified regulation and integrated regulation; Deci & Ryan, 2002).

SDT also proposes that there are essential conditions to ensure the growth in one's personality and cognitive structure, which are referred to as the three basic psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2002). Autonomy refers to being the origin or source of one's own behavior. Competence refers to feelings of effectiveness in association with an individual's interaction with the social environment and in experiencing opportunities to exemplify confidence in one's global capacity. Relatedness refers to having a sense of belonging and connection to other individuals and is reflected in the tendency to feel integral and connected to the lives of others (Deci & Ryan, 2002). SDT posits that these needs are universal and thereby function across gender, age, culture, and time. Indeed, when these needs are met and satisfied it can facilitate internalization and increase intrinsic motivation.

Wilson, Rodgers, Hall, and Gammage (2003) showed that exercise imagery is related to the behavioral regulations proposed in SDT in predictable ways. For example, more autonomous regulations were associated with task-oriented imagery. More recently, Stanley, Cumming, Standage, and Duda (2012) examined the relationship between exercise imagery, motivation, and exercise intention and behavior. They found comparable results to those of Wilson et al. (2003). Technique and enjoyment imagery were positively associated with more autonomous motivation, while appearance imagery was positively related to controlled motivation. In addition, and consistent with previous research, autonomous motivation was related to both exercise intention (e.g., Wilson & Rodgers, 2004) and behavior (e.g., Wilson, Rodgers, Blanchard, & Gessel, 2003). Stanley et al. suggested that imagery aimed to enhance autonomous motivation is a viable strategy that may facilitate the internalization of exercise behavior. They further suggested that future research should consider the role of the basic psychological needs when examining how the various types of imagery influence one's exercise motivation.

When children engage in leisure time physical activity, the behavior is referred to as active play rather than exercise. Active play can be defined as "unstructured physical activity that takes place [outdoors] in a child's free time" (Veitch, Salmon, & Ball, 2008, p. 870). Although active play can occur indoors, outdoor play, as highlighted in the definition, allows children to develop a sense of independence from parents (Ginsberg, 2007). Active play can include any form of unorganized play, such as playing tag with friends, playing catch, or skipping rope. Active play imagery is defined as picturing oneself engaging in unstructured play (Cooke, Munroe-Chandler, Hall, Tobin, & Guerrero, 2014). Recent qualitative findings indicated that children use active play imagery (Tobin, Nadalin, Munroe-Chandler, & Hall, 2013). Children used active play imagery, before and after active play, as well as for both motivational purposes and for skill improvement (Tobin et al., 2013). Cooke et al. (2014) identified three types of active play imagery: fun (i.e., images associated with enjoyment and interest), capability (i.e., imagery associated with feelings of competence), and social (i.e., images associated with playing with others).

Like adults' exercise imagery, can imagery also serve a motivating role in children's active play? Recent research provides some preliminary evidence to the affirmative. Tobin et al. (2013) demonstrated children's active play imagery facilitated the satisfaction of the basic psychological needs proposed by SDT. With respect to perceived autonomy, the children placed an emphasis on imaging their favorite activities and activities they did frequently. In terms of perceived competence, the children reported imaging themselves competent in their active play with many imaging themselves being better than they actually are physically. Further, perceived relatedness was found to be supported by children imaging themselves with friends, family, and others (e.g., neighbors, professional athletes).

The purpose of the present study was to examine the specific relationships between the three types of active play imagery (fun, capability, and social) and the three basic psychological needs (autonomy, competence, and relatedness). Based on previous literature demonstrating that imagery related to feeling capable in active play is linked to competence (Tobin et al., 2013), it was hypothesized that capability imagery would be positively related to perceived competence. Given social support is an important factor in PA (Duncan, Duncan, & Strycker, 2005) and that children often image themselves doing active play with others (Tobin et al., 2013), it was hypothesized that social imagery would be positively related to perceived relatedness. It was

also hypothesized that none of the imagery types would be associated to autonomy. Given that active play is autonomous by nature, partaking in the actual activity of active play will likely satisfy autonomy, and not the act of imaging active play.

Method

Participants

The participants included 253 (males n = 118; females n = 134; 1 missing) children aged 7-14 years old (M_{age} = 10.35 years; SD = 2.26). The participants were recruited from various summer activity programs (e.g., chess, web design, multi-sport) in Southwestern Ontario in the months of July and August.

Measures

Active play imagery. The Children's Active Play Imagery Questionnaire (CAPIQ; Cooke et al., 2014) was used to assess children's use of active play imagery. The questionnaire comprises 11 items representing fun imagery (e.g., "When thinking about active play, I picture myself having fun"), capability imagery (e.g., "When thinking about active play, I imagine the moves that are needed"), and social imagery (e.g., "When thinking about active play, I see myself with my friends"). The CAPIQ is rated on a 5-point scale (1=*not at all;* 5=*very often*) and possesses adequate internal reliability for all subscales (α's > .70; Cooke et al., 2014).

Basic psychological needs. The Basic Need Satisfaction in Physical Activity (BNS-PA); Gray, Prapavessis, & McGowan, 2009) was used to measure the basic needs. This questionnaire is derived from the Psychological Need Satisfaction in Exercise Scale (Wilson, Rogers, Rodgers, & Wild, 2006). The questionnaire comprises 16 items assessing the three basic psychological needs (autonomy, competence, and relatedness) for children in PA context. Given that the present study focused on active play, the items were modified to focus on active play. For example "I am good at physical activity" was changed to "I am good at active play". An example item of autonomy reads, "I choose what I am going to do for active play." An example item of competence is, "I am good at active play", and an example item for relatedness reads, "I like the kids who do active play with me." The BNS-PA is measured on a 7 point scale (1=*do not agree at all;* 7=*strongly agree*) and was originally created for children 10 years of age and older. All subscales from the questionnaire have demonstrated acceptable reliability (α's = .071

- .95; Gray, 2011). This questionnaire has also been used in previous work and shown to be adequate for the use with children in physical activity settings (Gray, 2011). Furthermore, this questionnaire has shown positive results in how the basic psychological needs relate to children's physical activity (Gray, 2011).

Procedure

Given the present study included participants as young as 7 years old, some of the items from both questionnaires used were slightly modified following the Flesch-Kincaid grade level readability test to fit the youngest reading level. For example, with respect to the CAPIQ, we simply changed the words "imagine" or "picture" (e.g., "I imagine the moves that are needed") to "see" (e.g., "I see the moves that are needed"). In regards to the BNS-PA, an example of item modification would be changing the word "complete" to "to do" ("I am able to complete active play that is hard" vs. "I am able to do active play that is hard").

Upon receiving ethical approval from the research ethics boards and upon receiving approval from the summer camp coordinators, data collection began. Children and their parents were approached during drop off and pick-up times at the camps and informed about the study. Once consent from parents and assent from the participants were obtained, the questionnaires (CAPIQ and BNS-PA) as well as demographic questions (i.e., age, gender, and favorite activities to play) were completed. The time to complete the questionnaires was approximately 15 minutes. The investigator remained at the venue until all questionnaires were returned and inquiries were answered.

Data Analyses

The data were screened for missing values, multivariate outliers, and multicollinearity. Descriptive statistics (i.e., means and standard deviations), internal consistency estimates, and correlations were also calculated using SPSS version 22. Further data analyses were conducted using Structural Equation Modeling (SEM). Specifically, the maximum likelihood estimation provided by AMOS 21.0 (Arbuckle, 2012) was used to examine the data. Prior to testing the hypothesized structural model, confirmatory factor analysis (CFA) was used to examine the factor structure of the two inventories used in the current study, since both are relatively new instruments. Following this, a latent factor model was tested to examine the relationships

between the three types of active play imagery and the three basic psychological needs with the items of each subscale serving as the observed variables. This approach was taken based on previous research (Reinboth, Duda, & Ntoumanis, 2004; Sheldon & Bettencourt, 2002; Standage, Duda, & Ntoumanis, 2003) and theoretical support that the basic needs co-exist (Deci & Ryan, 1985).

The current study proposed a unidirectional relationship between active play imagery and the basic psychological needs. However, an alternative model was estimated based on the possibility of reciprocal determinism, whereby "cognitive and personal factors, behavior, and environmental events all operate as interacting determinants that influence each other bidirectionally" (Bandura, 1991, p. 267). Perhaps children's use of active play imagery is a consequence of their basic needs being met in active play. For example, a child may experience a sense of belonging and connectedness with others in active play (relatedness), which may prompt favorable images of interacting and playing with others in active play (social imagery). Therefore, the alternative model included pathways from perceived competence to capability imagery, perceived relatedness to social imagery, and perceived autonomy to fun imagery. Similar to the hypothesized model, the residual terms of the three types of active play imagery were allowed to co-vary given that they are related.

Evaluation of model fit for the measurement and structural models was determined using several fit indices. The chi-square (χ^2) statistic was used to assess an acceptable fit of the hypothesized model and the data, wherein a non-significant ($p > .05$) χ^2 value is recommended. However, given the well-known caveat that χ^2 is sensitive to sample size (e.g., Kline, 2005; Marsh, 2007), absolute and incremental fit indices were also used to determine model accuracy (Hu & Bentler, 1999). Absolute fit indices included the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR), while incremental fit indices included the Comparative Fit Index (CFI). RMSEA and SRMR values equal to or less than .06 and .08 represent reasonable and good model fit, respectively. Similarly, CFI values equal to or exceeding .90 indicates a reasonable and good model fit (Hu & Bentler, 1999; Marsh, 2007).

Results

Preliminary Analyses

The results of the missing data analysis revealed that less than 5% of the data were missing, and that these values were missing completely at random. Missing values were replaced using an imputation technique (expectation maximization). Mahalanobis distance values were assessed to determine multivariate outliers and were evaluated using χ^2 distribution at $p < .001$, with the degrees of freedom equal to the number of variables in the entire data set (Tabachnick & Fidell, 2007). Three cases had values greater than $\chi^2(6) = 22.46$ and therefore were deemed outliers. The degree to which these outliers were influential cases was determined by Cook's distance values greater than 1. Given Cook's distance values ranged from .00 to .108, the three outliers were retained in the data set (Tabachnick & Fidell, 2007). Finally, absence of multicollinearity was obtained, as all condition index values were less than 30 (Tabachnick & Fidell, 2007).

Descriptive Statistics

Means, standard deviations, internal consistencies, and Pearson correlations for the study variables are presented in Table 1. Internal reliability for all the subscales was assessed through Cronbach's alpha coefficient. All alpha coefficients were above .70, which is acceptable (Nunnally & Bernstein, 1994).

Measurement Model

Given that both of the questionnaires are fairly new, it was important to ensure they were adequate models. A CFA was conducted and the results demonstrated good model fit for both the CAPIQ, $\chi^2 (41) = 93.88$, $p < .01$, RMSEA = .07; SRMR = .06; CFI = .95; and the BNS-PA, $\chi^2 (101) = 246.81$, $p < .01$; RMSEA = .08; SRMR = .06; CFI = .92. These results provide more evidence that these questionnaires are valid questionnaires to be used.

The Hypothesized Model

The hypothesized model examining the relationship between active play imagery and the basic psychological needs showed adequate fit to the data, $\chi^2 (314) = 566.16$, $p < .01$; RMSEA = .06; SRMR = .08; CFI = .92. Upon examination of the modification indices, a pathway was added between fun imagery and perceived competence. It is important to note that the path

linking fun imagery to perceived competence can be theoretically supported. Considerable evidence (Biddle, Wang, Chatzisarantis, & Spray, 2003; Cairney et al., 2012; Carroll & Loumidis, 2001; Fairclough, 2003; Hashim, Grove, & Whipp, 2008) has revealed that enjoyment in physical activity is linked with perceived physical competence (the desire to interact effectively within one's environment and to acquire desirable outcomes; Deci & Ryan, 1985). The results of the revised model revealed a slight improvement to the model fit, χ^2 (202) = 383.87, $p < .01$; RMSEA = .06; SRMR = .07; CFI = .93. Results demonstrated positive relationships among capability imagery and perceived competence, social imagery and perceived relatedness, and fun imagery and perceived competence (see Figure 1). Overall, the model accounted for 12.1 % of the variance in perceived competence and 25.5% of the variance in perceived relatedness.

Alternative Hypothesized Model

Results of the alternative model produced a satisfactory fit to the data, χ^2 (315) = 615.08, $p < .01$; RMSEA = .06; SRMR = .09; CFI = .90. All three pathways examined in the alternative model were significant (see Figure 2). In order to determine the most parsimonious model, the Akaike information criterion (AIC) fit index was assessed. Hu and Bentler (1999) suggested that the model with the smaller AIC value reflects a better fit of the hypothesized model. Results indicated the hypothesized model (AIC = 485.87) was more parsimonious than the alternative model (AIC = 741.08), and therefore more likely to be replicated in future studies using the same population (Bandalos, 1993). Based on the AIC index, the hypothesized model was deemed as the best-fitting model.

Discussion

The purpose of the present study was to examine the relationships between the three types of active play imagery (fun, capability, and social) as assessed by the CAPIQ (Cooke et al., 2014) and the three basic psychological needs (autonomy, competence, and relatedness) proposed in SDT (Deci & Ryan, 2002) as assessed by the BNS-PA. Given both questionnaires are fairly new, the present study also conducted a CFA for further psychometric testing of the questionnaires. The results demonstrated additional validity support for both questionnaires. In regards to the main purpose of the study, it was hypothesized that capability imagery would be positively related to perceived competence and social imagery to perceived relatedness.

Furthermore, it was hypothesized that none of the imagery types would be associated to autonomy. The results from the present study support our hypotheses. Positive relationships between capability imagery and competence, as well as social imagery and relatedness were supported. None of the imagery types were associated with autonomy. An unexpected finding was also discovered with fun imagery being positively associated with perceived competence.

SDT is a theory of human motivation which incorporates the basic psychological needs (Deci & Ryan, 2002). The findings from the present study follow previous research demonstrating that the motivation for adult's imagery use in physical activity setting is consistent with the SDT literature (Wilson et al., 2003). Earlier qualitative research from Tobin et al. (2013) demonstrated an association between active play imagery and the basic psychological needs. The present study looked to further examine that association.

The current findings indicated that capability imagery is associated with the basic psychological need of competence. Capability imagery incorporates perceived competence, achievement orientation, intention to be active, and rehearsal of movement (Cooke et al., 2014), while the need for competence is described as feeling successful in achieving a challenging task and engaging in occasion to express one's capabilities (Deci & Ryan, 2002). Competence also includes experiencing a sense of competence in producing desired outcomes (Deci, 1975; Deci & Ryan, 1985). Imaging being capable in an active play setting could be associated with wanting to produce a desired outcome; which would include being competent in active play. In addition, our results support Tobin et al. (2013) who found participants reporting images of being capable in active play to be connected to feelings of effectiveness in their environment. In a practical sense, if a child is imaging themselves being good at active play, it would be linked to them feeling effective and capable in that active play environment. More specifically, a child who images herself being good at dribbling a basketball may feel more competent regarding that skill when she executes that same skill in her active play. When the need for competence is achieved in physical activity, it can lead to an increase in motivation towards that activity (Ryan, Williams, Patrick, & Deci, 2009).

The present study also revealed a positive relationship between social imagery and relatedness. Social imagery incorporates images associated with encouragement from significant others, friend participation, and social support. The need for relatedness involves feeling connected, or feeling that one belongs in a social environment (Baumeister & Leary, 1995; Deci

& Ryan, 1985). Given the description of both constructs, it is not surprising that an association between the two was found. Research indicates that children prefer imaging themselves in active play settings with others, and that those images lead to a sense of perceived relatedness (Tobin et al., 2013). Therefore, if children are imaging themselves in active play with others (i.e., social imagery), it can facilitate a sense of togetherness with others (i.e., perceived relatedness). Indeed, if children are able to get a sense of togetherness with others through their imagery, it may push them to fulfill the need for relatedness through their active play.

An unexpected finding was that fun imagery was associated with perceived competence. Previous research has established that fun is the most prominent reason for children's engagement in physical activity (Gould et al., 1985; Miller & Kuhaneck, 2008). Qualitative research by Tobin et al. (2013) indicated that fun is a major component in children's active play imagery. They demonstrated that when children image themselves having fun in active play they are also often imaging themselves being physically competent in their activities, often imaging themselves better than they actually are physically (Tobin et al., 2013). Furthermore, Miller and Kuhaneck (2008) found that children perceive activities to be fun based on the challenge level; they prefer play that offers a suitable challenge level (i.e., not too easy, not too difficult), and judge an activity as being fun by the level of success they can achieve from the activity itself.

The present study found that none of the types of imagery were associated with autonomy. Autonomy is being the perceived origin or source of one's behavior and having control of the outcome (Deci & Ryan, 2002). In a practical sense, children who image themselves participating in active play will likely be focusing on enjoyable experiences rather than on their decision of which activity to perform. Play behaviors are commonly characterized as freely chosen, personally directed, fun, and intrinsically motivated (Brockman, Fox, & Jago, 2011). Given that active play is autonomous in nature, it is plausible that children's participation in active play activities (either actual or imaginative) is what helps satisfy the need for autonomy, not the choice of activity. Furthermore, the basic needs questionnaire used in the current study only measures one component of autonomy (i.e., perceived choice). Research has demonstrated that autonomy includes three concepts: volition, perceived locus of causality, and perceived choice (Reeve, Nix, & Hamm, 2003). Volition is "a sense of unpressured willingness to engage in the activity" (Deci, Ryan, & Williams, 1996, p.165). Perceived locus of causality is the belief that a behavior is started and controlled by a personal or an environmental force (deCharms,

1968). It would be important to measure all three as they overlap and are mutually supportive (Deci & Ryan, 1985). Given that the questionnaire used in the present study only included perceived choice, it could further help to explain why no link was found between any of the types of imagery and the need for autonomy.

The present study is not without other limitations. Children's imagery ability was not measured. Despite this potential limitation, previous research has established that children as young as five years old have the ability to image (Kosselyn, Margolis, Barrett, Goldknopf, & Daly, 1990). We also did not measure the children's level of active play. This was intentional as we did not want to over burden the participants with questionnaires. Because of the participants' age, we wanted to ensure they were able to remain focused while responding to the questions. Too many questionnaires may lead to participant fatigue thereby affecting the results (Belson, 1981).

This study provides insight into the relationship that exists between active play imagery and the basic psychological needs in children. Support for the promotion of a need supportive environment aimed at increasing unstructured leisure-time physical activity motivation for children is evident (Standage et al., 2003). It is essential to identify factors that may be associated with the satisfaction of the basic psychological needs, which could then lead to increased participation in physical activity. Understanding the associations between the different types of active play imagery and the basic psychological needs will facilitate the development of effective imagery interventions aimed at increasing children's motivation to be physically active. Imagery interventions can target satisfying the need for relatedness and competence by incorporating capability, fun, and social imagery. For instance, the imagery scripts would prompt children to image themselves being successful and competent in their active play, having fun while participating in active play, and enjoying the company of others (e.g. friends, siblings). Using imagery scripts to aid in the facilitation of children's basic psychological needs may positively influence children's motivation, which in turn may also positively impact their overall levels of physical activity. The results from this study provided pertinent information for the imagery scripts used in Study 2. Furthermore, incorporating imagery scripts into children's daily lives, perhaps during school hours, could also be beneficial. For instance, a two minute imagery script incorporating capability, fun, and social imagery, could be played over the speaker system during morning announcements at school. Given our earlier work (Tobin et al., 2013) and the

present findings, an imagery intervention may be one way to help motivate children to participate in active play.

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Table 1

Means, Standard Deviations, Internal Consistencies, and Correlations for all Study Variables

Variable	*M*	SD	α	1	2	3	4	5	6
CAPIQ									
1) Capability	3.30	1.01	.82	–	.32**	.35**	.26**	.13*	.08
2) Social	3.76	.81	.73		–	.54**	.19**	.35**	.09
3) Fun	4.27	.83	.82			–	.31**	.39**	.13*
BNS-PA									
4) Competence	5.92	1.00	.88				–	.38**	.41**
5) Relatedness	5.64	1.12	.85					–	.40**
6) Autonomy	5.18	1.14	.80						–

Note. The CAPIQ is rated on a 5 point Likert scale with 1=*not at all;* 5=*very often*; The BNS-PA is rated on a 7 point Likert scale with 1=*do not agree at all;* 7=*strongly agree*.
*p< .05, **p< .01

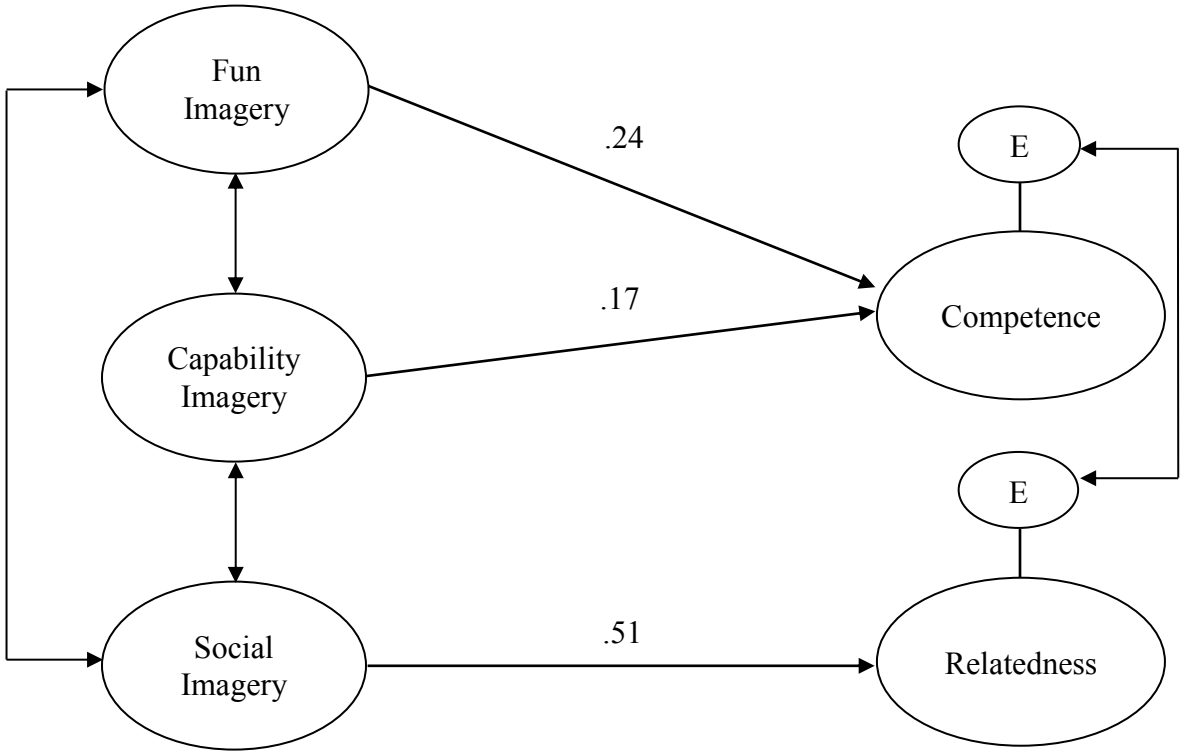

Figure 1. Relationship between active play and the basic psychological needs. This figure depicts the structural model representing the relationships between active play imagery and the basic psychological needs.
Note. All path coefficients presented are standardized and significant. Item indicators are not presented for simplicity reasons.

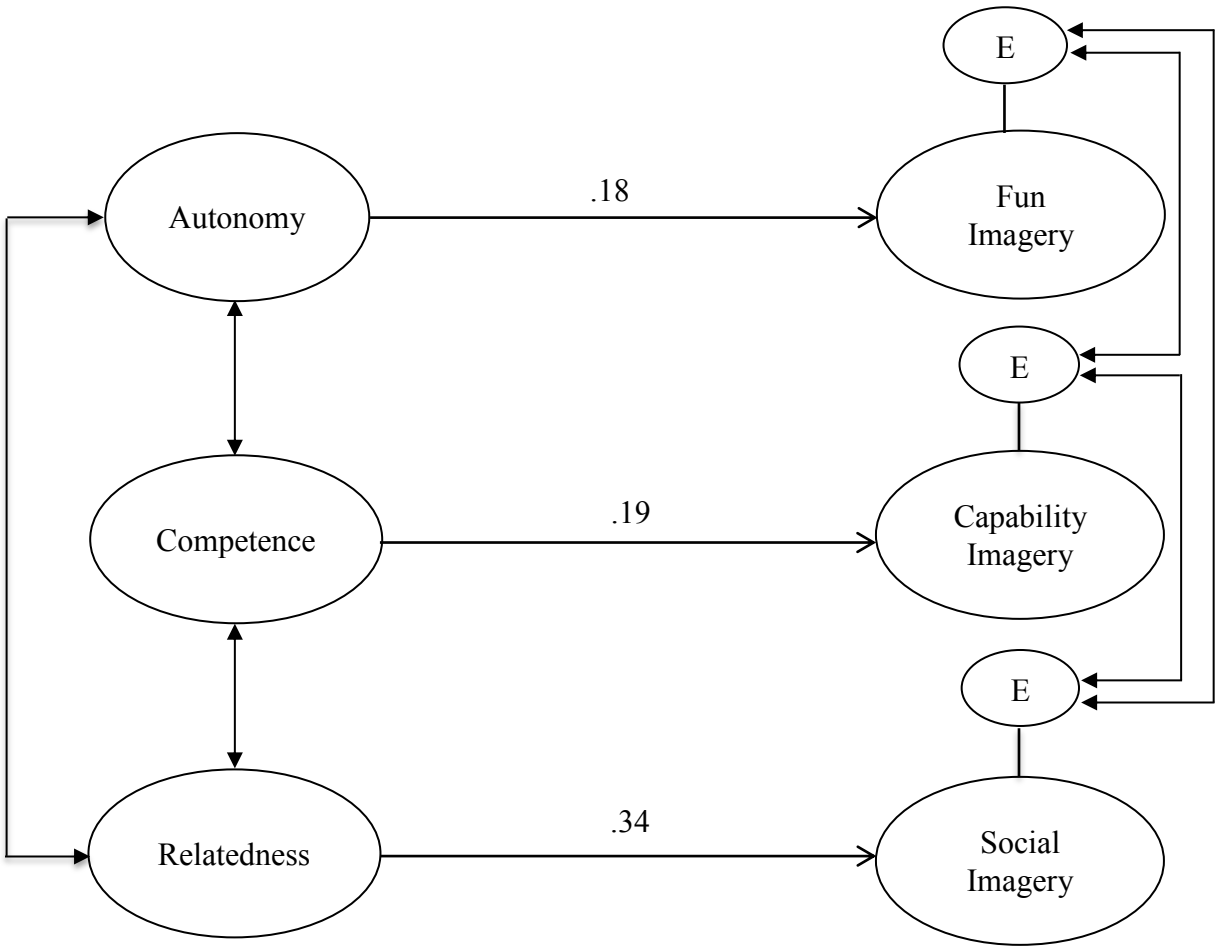

Figure 2. Alternative model. This figure depicts the relationships between the basic psychological needs and active play imagery.
Note. All path coefficients presented are standardized and significant. Item indicators are not presented for simplicity reasons.

STUDY 2

The Effects of an Imagery Intervention on Children's Active Play[2]

Daily physical activity is an important component for healthy living as it provides both psychological and physiological benefits (Janssen & LeBlanc, 2010). Although these benefits are well documented, physical inactivity is becoming a growing concern, especially in children. In Canada, 93% of children and youth do not meet the required 60 minutes of daily physical activity (Active Healthy Kids Canada (AHKC), 2014). Research states that physical activity (PA) decreases during adolescence (10-19 years old; Sallis, Prochaska, & Taylor, 2000); therefore, it's important to instill healthy PA habits in children. Furthermore, a physically active lifestyle during adolescent years is more likely to remain a physically active lifestyle in adulthood (Shepard & Trudeau, 2000).

There are two types of PA: structured and unstructured. When children participate in school physical education or on an organized sport team (e.g., soccer), this is commonly referred to as structured PA. In contrast, unstructured PA occurs when children direct their own behaviours and chose what activities they want to do (e.g., active play). Active play can be defined as "unstructured physical activity that takes place [outdoors] in a child's free time" (Veitch, Salmon, & Ball, 2008, p.870). Although active play can occur indoors, outdoor play is highlighted in the definition as it allows children to develop a sense of independence from parents (Ginsberg, 2007). Active play can include any form of unorganized play, such as playing tag with friends, playing catch, or skipping rope. Unstructured PA can provide various benefits not gained through organized PA such as distinct contributions to children's cognitive, physical, social, and emotional development (Burdette & Whitaker, 2005). Active play may be a good way for children to reach the recommended daily physical activity guidelines. Given that the quality of motivation plays a crucial role in the persistence of PA behaviours (Seghers, Vissers, Rutten, Decroos, & Boen, 2013), it is important to look at motivation when examining ways to increase children's PA.

Self-determination theory (SDT; Deci & Ryan, 2002) a theory of human motivation, and has been used to examine the influence of motivation on exercise participation (Hagger & Chatzisarantis, 2007). SDT stipulates that motivation lies on a continuum ranging from a lack of

[2] A version of this paper has been accepted in *The Journal of Applied Sport Psychology*

motivation (i.e., amotivation), to highly controlled motivation (i.e., external and introjected regulations), to more autonomous motives (i.e., identified, integrated, and intrinsic motivation). Amotivation is defined as a lack of intention to act. Extrinsic motivation is broken into four different types of extrinsic motivation which are: external, introjected, identified, and integrated regulation. External regulation is doing something for external rewards (e.g., monetary value). Introjected regulation is when a person is motivated by their own internal contingencies of reward and punishment (Ryan, 1982). Identified regulation is a more autonomous form of extrinsic motivation. It is defined as a person acting a certain way because he or she identifies with its purpose and value. Integrated regulation is the most autonomous form of extrinsic motivation and implies a behavior is considered a part of the self, but since it is done for some instrumental value it is still an extrinsic form of motivation. The final part of the motivation continuum is intrinsic motivation. Intrinsic motivation is doing something out of pure interest or enjoyment (Deci & Ryan, 2002). Intrinsically motivated actions represent self-determined behaviours that are performed for the inherent pleasures that emanate from an activity (Deci & Ryan, 2002).

SDT is composed of five mini theories, one of which is Basic Needs Theory (BNT; Deci & Ryan, 2002). BNT states that there are three basic psychological needs, which are innate to everyone regardless of age, gender, or culture (Deci & Ryan, 2002). The three basic psychological needs are: autonomy, competence, and relatedness. The need for autonomy is being the perceived origin or source of one's own behaviour (Deci & Ryan, 2002). It can include perceived choice, volition, and perceived locus of causality (Reeve, Nix, & Hamm, 2003). Competence refers to feelings of effectiveness in association with an individual's interaction with the social environment and in experiencing opportunities to exemplify confidence in one's global capacity. Relatedness refers to a sense of belonging and connection to other individuals and is reflected in the tendency to feel integral and connected to the lives of others (Deci & Ryan, 2002). People strive to be in an environment where the needs are satisfied. In addition, when these needs are met and satisfied it can facilitate internalization and increase intrinsic motivation (Deci & Ryan, 2002).

An individual's motivation towards activities can vary in the amount as well as the type (i.e., autonomous or controlled). Research on motivation demonstrates that autonomous (i.e., intrinsic, integrated, and identified motivation) and controlled motivation (i.e., introjected and

external motivation) lead to different outcomes (Deci & Ryan, 2008). Autonomous motivation results in greater psychological health, as well as more effective performance in activities than controlled motivation. In addition, autonomous motivation leads to greater persistence in activities (Deci & Ryan, 2008). In regards to research on motivation and children, most studies have focused on structured settings such as physical education (PE) classes. Various studies have shown that self-determined motivation towards PE predicted intentions to be physically active in leisure time outside of school (Standage, Duda, & Ntoumanis, 2003; Lim & Wang, 2009). Further research determined that student's intrinsic motivation in PE was positively associated with effort and intentions to be physically active (Taylor, Ntoumanis, Standage, & Spray, 2010). Research by Lim and Wang (2009) examined the relationship between students' perceived autonomy support, behavioural regulations, and their intentions to be physically active outside of school. Their study found that intrinsic motivation positively predicted student's intention to be physically active outside of school. Lonsdale, Sabiston, Raedeke, Ha, and Sum (2009) examined the relationship between students' motivation and their PA behaviour during structured and free choice (i.e., students did not receive instructions) PE classes. The results demonstrated that self-determined PE motivation was linked to higher levels of PA in both the structured and the free choice classes. However, self-determined motivation was associated to a greater extent when the students were in the free choice class. As noted by the authors, these findings provide preliminary evidence that the benefits of self-determined motivation in PA may be salient in unstructured PA contexts (i.e., active play). These findings demonstrated the importance of intrinsic motivation in promoting children's leisure time physical activity, and support the fact that intrinsic motivation leads to more positive consequences (Deci & Ryan, 2002).

As previously mentioned, children's motivation in PE has been shown to be associated with higher intentions to be physically active in leisure-time PA (Lim & Wang, 2009). Research has indicated that intrinsic motivation can play a mediating role in PE in regards to increasing PA levels. Chatzisarantis and Hagger (2009) found that intrinsic motivation mediated the effect of an intervention in PE on the PA behaviours of the students. Lim and Wang (2009) demonstrated that autonomy support in PE fostered more self-determined motivation, which in turn increased the student's intentions to be physically active outside of school. In addition, intrinsic motivation has been shown to mediate the relationship between needs support and PA in

middle school aged children (Zhang et al., 2011). Furthermore, Sebire, Jago, Fox, Edwards, and Thompson (2013) conducted a study which determined that intrinsic motivation was associated with children's PA behaviour. All these studies highlight the role that intrinsic motivation can have in understanding children's PA behaviours. Clearly, intrinsic motivation can play a mediating role in increasing children's PA levels.

Self-determination theory has also been used to examine the influence of PE on the satisfaction of children's psychological needs (Ntoumanis, 2001; Taylor, et al., 2010; Standage, et al., 2003). Ntoumanis (2001) found the social factors of co-operation, improvement, and choice in a PE setting were associated with the three psychological needs of autonomy, competence, and relatedness. Taylor and colleagues (2010) showed that with respect to the three needs, competence was the strongest predictor of intrinsic motivation. They also found that children with higher satisfaction of competence had a greater acceleration in leisure-time physical activity over the school trimester compared to children who had a low satisfaction of competence.

Imagery allows individuals to create or recreate experiences in their minds (Vealey & Greenleaf, 2010). Images are known to have powerful effects on behaviour, as well as self-concept and other cognitions (Hall, 2001). Hall (1995) was the first to propose that imagery may also be an effective means of influencing exercise behaviour. Exercise imagery research has primarily been studied with adults (e.g., Gammage, Hall, & Rodgers, 2000). Hausenblas, Hall, Rodgers, and Munroe (1999) established three types of imagery: energy, technique, and appearance. Energy imagery is imagery to energize oneself and psyche up. Technique imagery can be defined as imaging proper exercise techniques and form. Imaging oneself healthy and improving physical appearance is appearance imagery. Imagery has been shown to be effective in increasing exercise motivation (Wilson, Rodgers, Hall, & Gammage, 2003), as well as exercise self-efficacy (Cumming, 2008), and intentions to exercise (Rodgers, Munroe, & Hall, 2002). Imagery could have a positive influence on the motivation of exercisers (Hall, 1995). Wilson, Rodgers, Hall, and Gammage (2003) showed that the more self-determined forms of motivation were associated with both technique and energy imagery, while more controlled forms of motivation (i.e., introjected) were strongly associated with appearance imagery. Similar results were found by Stanley, Cumming, Standage, and Duda (2012) who examined the

relationship between exercise imagery, motivational regulation, and intentions to exercise and behavior. Their results indicated appearance imagery was positively related to controlled motivation, while technique and enjoyment imagery were positively related to more autonomous motivation. The findings from these studies are consistent with previous research demonstrating autonomous motives are linked to both exercise intentions and exercise behavior (e.g., Wilson, Rodgers, Blanchard, & Gessel, 2003). A missing component in the literature is that exercise imagery and motivation together have only been examined in adults.

Imagery use by children in sport settings has been quite thoroughly studied showing, for example, that it can increase self-efficacy (Munroe-Chandler, Hall, & Fishburne, 2008). Research also has established that imagery interventions with children in a sport domain are effective (Munroe-Chandler, Hall, Fishburne, & Shannon, 2005). An intervention was conducted with 7-10 year old athletes to examine the impact of imagery training on performance (Li-Wei, Qi-Wei, Orlick, & Zitzelsbergers, 1992). The study revealed that the imagery intervention was able to enhance the quality of the athletes' performances. More recently, O, Munroe-Chandler, Hall, and Hall (2014) determined that an imagery intervention could enhance self-efficacy in squash athletes aged 7-14 years. Given that research has shown the effectiveness of imagery interventions in sport, research on imagery in exercise (active play) with children should be examined. Qualitative research established that children aged 7-14 years old used active play imagery (Tobin, Nadalin, Munroe-Chandler, & Hall, 2013). It was found that children used active play imagery for various reasons such as for improving their skills and increasing their confidence in active play activities. Children expressed preferring to image themselves with others (e.g., friends) and imaging themselves having fun and enjoying the active play activities. Following this research, Cooke, Munroe-Chandler, Hall, Tobin, and Guerrero (2014) categorized three types of active play imagery: fun imagery, social imagery, and capability imagery. Fun imagery incorporates images of enjoyment and interest, while social imagery incorporates images of encouragement to be active from significant others. Finally, capability imagery incorporates images of perceived competence, self-efficacy and achievement orientation. A recent study examined the specific links between the three types of imagery and the three basic psychological needs as outlined in SDT (Tobin, Munroe-Chandler, Hall, Guerrero, Shirazipour, & Cooke, submitted). SEM indicated that fun imagery was linked to competence, social imagery was linked to relatedness, and capability imagery linked to

competence. This study along with the previously mentioned studies, provide initial support for a link between active play imagery and components of SDT.

Given that most Canadian children are physically inactive, it is important to find ways to promote PA behaviour, and active play may be an avenue to pursue. Furthermore, imagery could be a way to influence active play directly or indirectly through either enhancing motivation or basic psychological needs. The purpose of the present study was to determine if a six week active play imagery intervention could increase children's active play levels. It was hypothesized that children in the imagery intervention group would increase their active play levels compared to those in the control group. A secondary purpose was to examine if intrinsic motivation would mediate the relationship between active play imagery and active play levels. It was hypothesized that active play would be mediated by intrinsic motivation. A third purpose was to examine if the basic psychological needs mediated the relationship between the imagery intervention and active play levels. It was hypothesized that active play would be mediated by the basic psychological needs.

Method

Participants

The study had 83 participants at baseline. Of the original 83 participants, 8 participants dropped out of the study, while 16 participants had incomplete data (i.e., either questionnaire data or pedometer data). A total of 59 participants completed the intervention. Out of the 59 participants there were 23 male and 36 female children aged 9-11 years old (M= 10.23 years; SD= .79). The participants were recruited from schools in southwestern Ontario. Participants were randomized by their classroom, and divided into one of two groups: imagery group (N=33) or the control group (N=26). Of the 59 participants, 84% of them called in 3 times a week, every week.

Measures

Active Play:The Yamax Digiwalker SW 700 Pedometer measured participants' physical activity levels through their step counts. This small (50 x 38 x 14mm), lightweight (21g) pedometer is worn on the right hip, around the waistband or belt. The pedometer recorded how many steps each participant took daily over a 7 day period. The Yamax Digiwalker has been

found to be one of the most accurate and reliable pedometers (Bassett et al., 1996; Schneider, Crouter, Lukajic, & Bessett, 2003).

Physical Activity: Physical activity levels were measured subjectively using the Physical Activity Questionnaire for Older Children (PAQ-C; Crocker, Bailey, Faulkner, Kowalski, & McGrath, 1997). It is a self-reported measure of physical activity on a 7 day recall. The instrument assesses general levels of physical activity. It is composed of 9 items reported on a 5 point scale (1=*none;* 5=*5 times last week*). An example item reads "In the last 7 days, on how many days right after school, did you do sports, dance, or play games in which you were very active?" In addition, the questionnaire asks participants to rate on a scale of 1 to 6 how many times they participated in a specific activity (e.g., tag; bicycling; basketball). The PAQ-C has been validated with children aged 9-14 years old (Kowalski, Crocker, & Faulkner, 1997) and demonstrated adequate internal consistency (Crocker et al., 1997). In the present study, the questionnaire was used to determine how active the sample was on a general level.

Basic Psychological Needs: Basic psychological needs were measured using the Basic Need Satisfaction in Physical Activity (BNS-PA; Gray, Prapavessis, & McGowan, 2009) which was derived from the Psychological Needs Satisfaction in Exercise Scale (Wilson, Rogers, Rodgers, & Wild, 2006). The questionnaire includes 16 items assessing the three basic psychological needs (autonomy, competence, and relatedness) in a physical activity context. Given that the present study focused on active play, we used the modified version of the BNS-PA, which focuses on active play used in Tobin et al. (submitted). An example item for autonomy is "During active play, I do what I want to do". An example item for competence is "I've got a lot of skill when doing active play". An example item for relatedness is "When doing active play, it is with my buddies". The BNS-PA is measured on a 7 point scale (1=*do not agree at all;* 7=*strongly agree*). The questionnaire was originally created for children aged 10 years old and older. However, Tobin et al. (2013) slightly modified the items following the Flesch-Kincaid grade level readability test, to fit the readability for children as young as 7 years old. Given that some of our participants in the study included children under 10 years old, we used Tobin et al. (2013)'s modified version. The questionnaire has shown adequate internal reliability ($\alpha > .70$; Gray, 2011) as well as adequate psychometric properties (Tobin et al., submitted).

Intrinsic Motivation: Motivation was measured using the intrinsic motivation subscale of the Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000). The SIMS is scored on a 7 point Likert scale (1=*correspond not at all;* 7=*correspond exactly*). An example item of intrinsic motivation reads "Because I think that active play is enjoyable". Acceptable Cronbach alpha coefficients (>.70; Nunnally & Bernstein) for the intrinsic motivation subscale have been found in previous work with similar-aged children (Parish & Treasure, 2003).

Imagery Ability: The Movement Imagery Questionnaire for Children (MIQ-C; Carter, Yoxon, Ste-Marie, Cumming, & Martini, 2013) is comprised of 12 items designed to measure a participant's imagery ability. The questionnaire is divided into three imagery perspectives: kinesthetic, internal, and external. The questionnaire asks the participant to do four different movements and then imagine them three times (once for each perspective). They are to rate how easy or hard it was to feel (kinesthetic), see through their own eyes (internal), or see it as though they were watching a video (external) the movement. The participants rated how easy or hard it was on a 7 point Likert scale (1=*very hard;* 7=*very easy*). The MIQ-C has demonstrated, in previous work, adequate internal reliability for all subscales (α's = > .70; Quinton et al., 2014).

Pilot Study

A pilot study was conducted with 17 females aged 9 and 10 years old (M = 9.57, SD = .53). The pilot study provided information on the questionnaires and the imagery scripts before proceeding with the larger scaled study. Based on the findings from the pilot study a few modifications were made. The first modification was regarding the Likert scale for the questionnaires to include only written labels with a circle accompanying each label. The participants in the pilot study expressed a confusion regarding the numerical labels as a simple number representing a meaning (e.g., 1 = *completely agree*). The participants in the pilot study interpreted the number as a best-to-worst scale with the higher numbers being "better" scores. Research has demonstrated that the type of labelling on a questionnaire can influence the response quality in children. Children find written labels easier to comprehend compared to numeric labels (Alwin & Krosnick, 1991). In regards to the SIMS questionnaire and the BNS-PA, the number of response options was reduced from seven to four (i.e., 1 = *completely disagree;* 4 = *completely agree*). The children in the pilot study had difficulty distinguishing

between the different response options. Previous research has suggested that three to four options is best for children under 11 years old (Borgers & Hox, 2001). Lastly, the speed of the audio recordings was decreased based on feedback that it was read too quickly.

Procedure

Upon receiving ethical approval from the research ethics board, schools in southwestern Ontario were contacted. Once permission from the schools was granted, and permission from parents/guardians and assent from participants were received, data collection began. Participants were randomly assigned to either the control group or the imagery group. The intervention took place over six weeks. The first week (i.e., baseline) was used to gather baseline information on the participants by having them complete the BNS-PA, the CAPIQ, the PAQ-C, and the SIMS. In addition, the participants were each given a pedometer and shown how to use it (i.e., how to read their daily step counts). Participants were instructed to wear the pedometer on their hip and shown how to clip it on and off. The second week, the pedometer data from each participant was recorded for the previous week. Furthermore, participants were asked to complete the PAQ-C as well as the MIQ-C (Novak et al., 2012). In addition to collecting data, participants were also shown how to use the telephone call-in system to access the imagery scripts or the short story (depending on their group). Participants were shown step by step instructions on how to access the scripts. They were also given written instructions on how to access the phone system. Participants were told to call in three times per week to listen to the scripts. The participants met with the research once a week for the next five weeks. They were asked to bring in their pedometer every time to be able to mark down their step counts and they also completed the PAQ-C. Furthermore, the participants were asked to call in three times a week each week to listen to the scripts. At the end of the six weeks, the participants met with the researcher one last time to hand in their pedometer. They completed the same questionnaires as the first week (i.e., CAPIQ, SIMS, BNS-PA, and PAQ-C).

Intervention

Imagery Group

The imagery group received four imagery scripts throughout the four week intervention phase (i.e., week 2 to week 5). They had a new imagery script each week. The imagery scripts were the same for all participants and were created following the guidelines established by

Cooley, Williams, Burns, and Cumming (2013). The imagery scripts began with a definition of active play, and asked the participants to find a quiet place for them to listen to the audio recording. The imagery scripts were based on fundamental movement skills, including, jumping, running, kicking, throwing, catching, and skipping. Given that fun is the most prominent reason for children to partake in PA (Brockman, Jago, & Fox, 2011), and based on previous research showing the association between intrinsic motivation and PA (Sebire et al., 2013) the imagery scripts were written to instill intrinsic motivation. The imagery scripts asked participants to image themselves having fun and enjoying themselves. Based on previous findings (Tobin et al., submitted) the imagery scripts also touched upon the need for competence and relatedness. The imagery scripts had participants image themselves being good at the active play skills (to instill competence) and imaging themselves with their friends (to instill relatedness). Based on our findings from the pilot study the imagery scripts were approximately five minutes in duration.

Control group

The control group listened to two short stories, *The Case of the Daily Telegraph* and *The Case of the Broken Lock*. The stories were taken from the book "*The Adventures of Jack Lime"* by James Leck. Participants listened to *The Case of the Daily Telegraph* the first two weeks of the intervention and *The Case of the Broken Lock* during the third and fourth week of the intervention. Each story was broken down into six chapters that were each approximately 5 minutes long. Participants listened to three chapters each week.

Audio Recording and Incentives

The imagery scripts and book chapters were delivered through an automated telephone system. The participants called into a toll free number and followed the prompts depending on their group (i.e., imagery or control). For example, the imagery group pressed 1 while the control group pressed 2 to be transferred to their respected scripts. The imagery group had the script start immediately as there was just one every week. However, the control group had to follow another prompt depending on which chapter of the story they were at. Once the audio recording finished, the participants were asked to leave a voicemail with their ID number. This allowed us to track how many times each participant called into the telephone system. Participants initiated all calls which allowed them to call in at their desired time of day, and they were asked to call in three times a week each week.

Incentives were used in the present study as they have been shown to promote participation (Rice & Broome, 2004). The compensation was in the form of gift cards. Research has shown that monetary incentives can be effective with children participants, if the incentive is proportional to the burden of data collection (Rice & Broome, 2004). Given that the participants were asked to call in three times a week for four weeks, the compensation was based on the number of calls each participant made. For each call the participant made, they were attributed a gift certificate of $2.50. Each week the participants could get a total of $7.50 in gift certificates. The gift certificates were given at the end of the week. This was done based on previous research that states giving incentives throughout a study can increase adherence to the study, compared to a one time lump sum (Rice & Broome, 2004). At the end of the study if a participant called 3 times each week they would have received gift certificates adding up to the amount of $30.

Data Analysis

Data were screened for accuracy of data entry, missing values, and outliers. Results showed that less than 5% of the data were missing, and that these values were missing completely at random. Missing values for the questionnaire data were replaced using an imputation technique (expectation maximization). Missing pedometer data were replaced using a case mean substitution. Missing weekday pedometer data were replaced with the mean of the participant's own weekday step count. A similar procedure was conducted for the weekend pedometer data. With respect to the questionnaire data, no univariate outliers were found (as indicated by z scores greater than 3.29). In terms of the pedometer data, cases were deemed as outliers if step count was less than 1000 or more than 30,000 (Rowe, Mahar, Raedeke, & Lore, 2004). Further, reactivity testing was performed on the pedometer data given the pedometers were unsealed (Ozdoba, Corbin, & LeMasurier, 2004). Reactivity is when the testing process impacts the behaviour (Rowe et al., 2004). In regards to reactivity with pedometers it would be participants trying to increase their step count more than their typical step count. Furthermore, fidelity checks were also done in regards to compliance rates and manipulation checks, to ensure that the participants were listening to the scripts properly.

Results

Descriptive statistics for all variables (imagery ability, basic psychological needs, intrinsic motivation, and levels of active play (pedometer step count) are shown in Table 1. The results demonstrated that both the imagery and control group had adequate imagery ability on all three subscales (i.e., kinaesthetic, internal, and external). Results indicated that for all participants visual imagery (i.e., internal and external perspectives) was easier than kinaesthetic imagery; kinaesthetic imagery $M = 6.00$ ($SD = .87$), internal imagery $M = 6.49$ ($SD = .61$), and external imagery $M = 6.46$ ($SD = .58$). In addition, there was no significant difference between the two groups in their imagery ability. The results were: kinaesthetic: $t\ (57) = .61$, $p = .539$; internal: $t\ (57) = 1.90$, $p = .06$; external: $t\ (57) = 1.71$, $p = .09$.

The participants also completed the PAQ-C which provided us with a general assessment of their overall physical activity levels. The participants in the present study were a moderately active sample ($M = 3.18$, $SD = .82$).

Basic Psychological Needs

Basic needs were measured both at baseline and post-intervention. T-tests were conducted at baseline and at post-intervention to compare the basic needs of both groups. At baseline there was no significant difference between the two groups for each of the basis psychological needs; autonomy: $t\ (57) = 1.06$, $p = .29$; competence $t\ (57) = 1.76$, $p = .08$; and relatedness $t\ (57) = .46$, $p = .64$. The t-test conducted at post-intervention indicated a significant difference for both autonomy ($t\ (57) = 2.31$, $p = .02$) and for competence ($t\ (57) = 2.28$, $p = .02$), with the imagery group having higher scores than the control group**.**

Active Play

To examine the effects of the imagery intervention on physical activity levels, a 2 (Group; imagery and control) X 2 (Time; pre and post-intervention) ANOVA with repeated measures on time was conducted. Results demonstrated a main effect for Group, $F\ (1, 57) = 5.55$, $p = .045$, $\eta^2 = .089$, and a Group X Time interaction, Pillai's Trace = .068, $F\ (1, 57) = 4.18$, $p = .045$, $\eta^2 = .068$. The mean scores demonstrated that the active play levels for the children in the imagery group were higher ($M = 10115.45$; $SD = 2834.96$*)* compared to the active play levels of the children in the control group ($M = 8830.53$; $SD = 1784.49$). In regards to the

interaction, paired samples t-test were conducted and showed that the levels of active play significantly decreased for the control group from pre- to post-intervention, $t(25) = 2.38$, $p = .026$, while the imagery group showed no change from pre- to post-intervention, $t(32) = .807$, $p = .426$; see Figure 1.

Intrinsic Motivation

Figure 2 depicts participants' intrinsic motivation measured at baseline and post intervention. Again a 2 (Group; imagery and control) X 2 (Time; pre and post-intervention) ANOVA with repeated measures on time was conducted and there proved to be a significant interaction between group and time, $F=4.59$ (1, 57), $p=0.03$, $\eta^2 = .07$. The results indicated that the imagery group had higher levels of intrinsic motivation at post-intervention compared to the control group.

Mediation Analysis

Mediation analysis was conducted to see whether intrinsic motivation at post-intervention mediated the relationship between the imagery intervention and active play levels (at post-intervention). The mediation analysis was conducted using SPSS macro developed by Andrew F. Hayes, and is shown in Figure 3. The findings demonstrated that the intervention significantly predicted intrinsic motivation ($\beta = .28$, $t = 2.38$, $p = .02$), with participants in the imagery intervention group having higher levels of intrinsic motivation following the completion of the intervention compared to those in the control group. Intrinsic motivation did not predict levels of active play ($\beta = 1495.80$, $t = 1.80$, $p = .07$). However, intrinsic motivation mediated the effect of the intervention on levels of active play (95% CI [25.77, 1183.20]). The relationship between the intervention and active play decreased after the inclusion of intrinsic motivation (from 2194.77 to 1779.41) and remained significant ($t = 2.32$, $p = .024$), therefore suggesting partial mediation. The overall model explained 18% of the variance in levels of active play, F (2, 56) = 6.14, $p = .004$.

Furthermore, a mediation analysis was conducted to see if the basic psychological needs mediated the relationship between the imagery intervention and active play (at post-intervention). The mediation analysis was conducted using SPSS macro developed by Andrew F. Hayes, and is shown in Figure 4. The mediation analysis included an overall basic psychological

needs score (combining all three needs together). The results demonstrated that the imagery intervention significantly predicted the basic psychological needs (β = .25, *t* = 2.65, *p* = .01), with participants in the imagery group having higher levels of overall basic psychological needs at post-intervention. The basic psychological needs significantly predicted levels of active play (β = 3439.12, *t* = 3.53, *p* = .00). The mediation analysis revealed that the basic psychological needs mediated the effect of the intervention on the active play level. The relationship between the intervention and active play levels was non-significant, (β = 1351.90, *t* = 1.88, *p* = .06), which implies full mediation. The mediation model explained 29% of the variance in levels of active play *F* (2, 57) = 11.45, *p* = 0.06. Following the mediation analysis of the overall basic needs, we examined mediation analysis for each individual psychological need. In regards to autonomy, it was shown that the intervention significantly predicted autonomy (β = .33, *t* = 2.31, *p* = .02), and autonomy significantly predicted levels of active play (β = 1529.950, *t* = 2.34, *p* = .02). The relationship between the intervention and active play decreased after the inclusion of autonomy (from 3644.57 to 1778.56) and remained significant (*t* = 2.23, *p* = .029), therefore suggesting partial mediation. When it comes to competence, the intervention significantly predicted competence (β = .25, *t* = 2.28, *p* = .02) and competence significantly predicted levels of active play (β = 2869.52, *t* = 3.58, *p* = .00). The mediation revealed only a partial mediation, as the model remained significant (*t* = 2.05, *p* = .04). Finally, the intervention did not significantly predict relatedness (β = .14, *t* = 1,20, *p* = .23) while relatedness did not significantly predict levels of active play at post-intervention (β = 1446.24, *t* = 1.74, *p* = .08). The mediation analysis reveals a partial mediation was found (*t* = 2.68, *p* = .00).

Discussion

The present study examined whether a six week active play imagery intervention could help to increase children's physical activity levels. It was hypothesized that the children in the imagery group would have higher physical activity levels at post-intervention compared to children in the control group. The second purpose of the study was to determine whether intrinsic motivation (at post-intervention) mediated the relationship between the intervention and levels of active play (at post-intervention). It was hypothesized that the levels of active play would be mediated by intrinsic motivation. The third purpose was to determine whether the basic

psychological needs (at post-intervention) mediated the relationship between the intervention and levels of active play (at post-intervention).

In terms of the study's first purpose, the results demonstrated that the children in the imagery intervention group had higher levels of active play at post-intervention compared to children in the control group. The current findings demonstrate that children who imaged themselves playing active play activities were in fact more active than children who did not image themselves. These results make conceptual sense. Research has shown that when individuals imagine situations or events the likelihood of those situations/events happening in real life is greater (Taylor, Pham, Rivkin, & Armor, 1998). The difference in active play levels between the two groups at post-intervention was a result of the control group changing their active play. The participants in the control group significantly decreased their active play levels from pre- to post-intervention, whereas the imagery group maintained their active play levels over that period. Therefore, it can be stated that the active play imagery intervention allowed children to maintain their active play levels.

PA is a multifactorial behaviour influenced by psychological, social, environmental, and demographic variables (Welk, 1999). An environmental factor that has been identified as playing an important role in children's PA levels is the weather. Weather can either help to promote or to prevent PA (Merrill, Shields, White, & Druce, 2005). PA levels are higher in the summer months and lower in the winter months (Tudor-Locke et al., 2004). Research has examined whether day length, rainfall, temperature, wind speed, and duration of bright sunshine can affect children's PA (Duncan, Hopkins, Schofield, & Duncan, 2009). Duncan and colleagues (2009) found a decrease in temperature and an increase in rainfall had a negative impact on step counts, regardless of wind speed, duration of bright sunshine, and day length. Given that active play is often done outdoors, it is important to note the role weather can have on participation in active play activities. The present study was conducted in Southwestern Ontario, which has cold and snowy winters. The intervention spanned over the end of fall and beginning of winter. The transition from one season to another can be accompanied by drastic changes in the weather. The average temperature in the fall is 10 degrees Celsius while the average temperature for the beginning of winter (end of the intervention) is one degree Celsius. In spite of the weather changes, the participants in the imagery group were able to maintain their active play levels

going into the start of the winter. Given that previous research has stated that a change in temperature can affect children's PA levels, it's possible that this is the reason why the control group significantly decreased their PA levels from pre to post intervention. As noted by Tucker and Gilliland (2007), it is important to focus on ways to get children physically active in regions that experience long and cold winters. Given the findings in the present study, imagery may be a strategy to help in doing so.

The second purpose of the current study was to examine if intrinsic motivation mediated the relationship between the intervention and active play at post-intervention. As hypothesized, the mediation analysis indicated that the effect of the intervention on active play was explained in part by intrinsic motivation. This result supports previous research suggesting imagery could influence PA behaviour indirectly through motivation (Giacobbi, Hausenblas, Fallon, & Hall, 2003). In addition, the current finding supports previous research that has found intrinsic motivation to mediate PA levels in children (Zhang et al., 2011). The present findings make conceptual sense as people who are intrinsically motivated partake in activities for the interest and spontaneous enjoyment (Standage & Ryan, 2012), which basically defines active play activities.

The third purpose of the study was to examine if the basic psychological needs mediated the relationship between the intervention and the active play levels. As hypothesized the basic psychological needs, as an overall score, mediated the relationship between the imagery intervention and the active play levels. The results demonstrated that the intervention was significant on its own; however, the basic psychological needs increased the effects of the imagery intervention on the active play levels. Previous research has demonstrated the basic psychological needs played a mediating role in PA with children (Zhang et al., 2011). Furthermore, given that the imagery scripts in the present study incorporated components of the basic psychological needs, it makes conceptual sense that they would play a mediating role between the intervention and active play. In addition, active play imagery has been shown to be associated with the basic psychological needs in previous research (Tobin et al., submitted). When examining the basic psychological needs individually, the results demonstrated that individually the psychological needs each only partially mediated the relationship between the

intervention and the levels of active play at post-intervention. These results still demonstrate the importance the basic psychological needs can have when examining active play.

The present study also demonstrated that at post-intervention the participants in the imagery group had significantly higher need satisfaction for competence and autonomy compared to the control group. A potential explanation could stem from the fact that active play is very autonomous in nature, and given that the participants in the imagery group had higher levels of active play, their need for autonomy was higher. Furthermore, imagery is an autonomous activity by nature, and it may foster self-determined motives for physical activity through higher autonomy (Giacobbi et al., 2014). In regards to the increase in competence, the imagery scripts were geared towards having the participant's image themselves being good and skilled in their movements, which could explain their higher scores for this variable.

A strength of the study lies in the fact that an objective measure was used to assess the active play levels. It has been shown that children and adolescents have difficulty recalling past PA behaviour (Pate, 1993). Using pedometers probably allowed for more accurate active play measurement compared to relying solely on self-reported active play (i.e., questionnaires). A second strength of the study is that the mediation analysis was conducted over a temporal period.

The present study is not without any limitations. To begin, the length of the imagery intervention was a limitation. The imagery intervention was only four weeks long. Perhaps a longer intervention phase (i.e., six or eight weeks) may allow time for a positive change in active play levels. Furthermore, having more information on the pedometers would have been valuable. We did not have any information on whether the pedometers reset throughout the day. If a pedometer reset, then the step count would not be accurate. Asking participants to indicate if their pedometer reset at any point would allow for more accurate data. In addition, the pedometers only calculated step count, therefore could not be used for certain activities like bicycling or swimming (they were not waterproof). Perhaps having a more sophisticated objective measure (e.g., accelerometer) would have been beneficial.

Given that the present study showed very encouraging results of an active play imagery intervention on active play, this area should continue to be explored. However, there are a few points to consider for future research. The imagery scripts in the present study were based on the

fundamental movement skills (e.g., throwing, catching, jumping). Every participant listened to the same imagery scripts. Research has shown that personalised imagery scripts lead to stronger imagery (Wilson, Smith, Burden, & Holmes 2010). Perhaps having imagery scripts individualized for each participant, based specifically on their favorite active play activities may be more beneficial. Furthermore, based on the limitations of the study, having a longer imagery intervention phase could be helpful. For example, the imagery intervention could be six or eight weeks long instead of four. Finally using a more sophisticated objective measure of active play would be beneficial as well. Although there are many benefits of pedometers (i.e., light weight, easy to use), they only calculate step count. Having a more sophisticated device (e.g., accelerometer) that would be able to distinguish between light, moderate, and vigorous PA would be beneficial for future research studies.

In conclusion, the results from the present study indicate that an active play imagery intervention was able to maintain children's active play levels. This result is encouraging as it is important to determine strategies to increase children's physical activity levels, and imagery may be one of those strategies. The present study also indicated that intrinsic motivation was a partial mediating role to physical activity behaviour. Furthermore, the basic psychological needs mediated the effects of the intervention on active play. Children should be encouraged to image themselves enjoying their active play, as well as imaging themselves being skilled and having fun with their friends while playing.

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Table 1

Descriptive data for variables at baseline and post-intervention

	Baseline		Post Intervention	
	Control (Lion) Mean (*SD)*	Experimental (Tiger) Mean (*SD)*	Control (Lion) Means *(SD)*	Experimental (Tiger) Mean (*SD)*
Imagery Ability				
Kinaesthetic	6.08 *(.62)*	5.94 (*1.03)*		
Internal	6.66 *(.47)*	6.36 *(.87)*	N/A	N/A
External	6.59 *(57)*	6.31 (*.61)*		
Basic Psychological Needs				
Autonomy	3.16 (*.43)*	3.27 (*.40)*	3.03 (*.55)*	3.36 (*.55)*
Competence	3.42 *(.50)*	3.64 *(.42)*	3.38 *(.41)*	3.64 *(.43)*
Relatedness	3.52 *(.52)*	3.57 *(.33)*	3.39 *(.51)*	3.53 *(.38)*
Motivation				
Intrinsic	3.74 *(.46)*	3.78 *(.31)*	3.54 *(.57)*	3.82 *(.30)*
Active Play Levels	9375.66 *(2498.34)*	10019.20 *(2642.73)*	8281.36 *(2172.12)*	10476.14 *(3270.13)*

Note. Kinaesthetic, internal, and external imagery are rated on a 7-point scale; basic psychological needs are rated on a 4-point Likert scale; intrinsic motivation is rated on a 4-point Likert scale; Active play levels are measured using the pedometer step counts

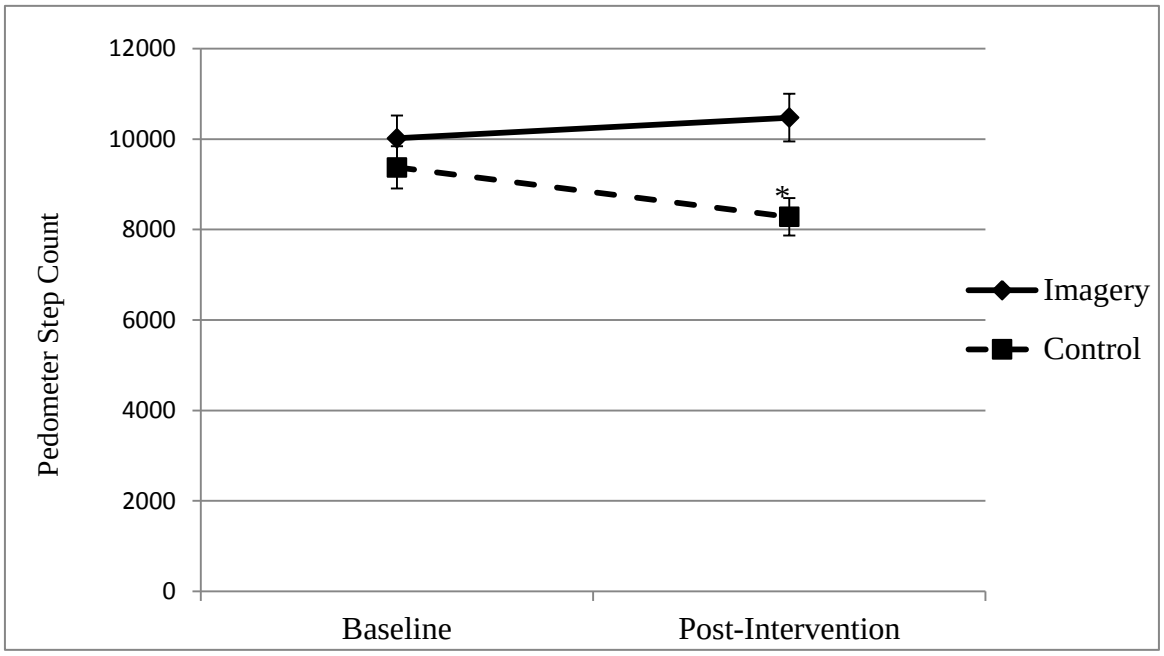

Figure 1 Active Play Levels. The figure represents the levels of active play (step-counts) from baseline and post-intervention for both groups (imagery and control)
Note: The * represents the significant decrease of the control group from baseline to post-intervention

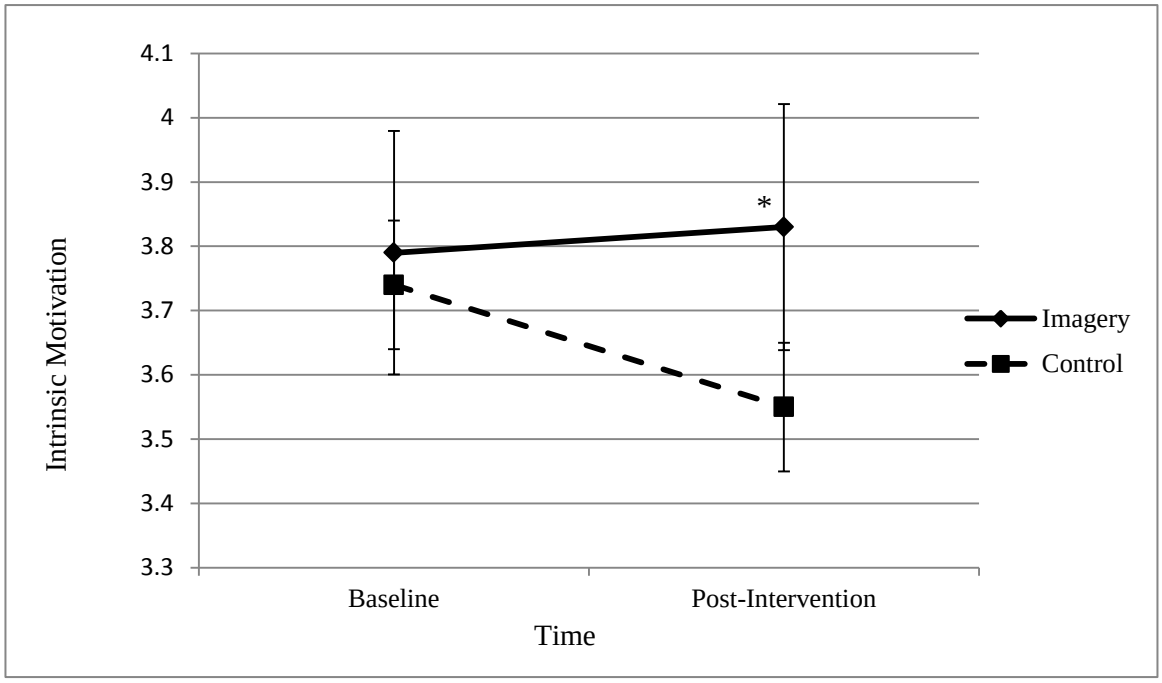

Figure 2 Intrinsic Motivation. The figure represents intrinsic motivation levels from baseline and post-intervention for both groups (imagery and control)

Note: The * represents a significant difference in intrinsic motivation at post-intervention between the imagery and the control group

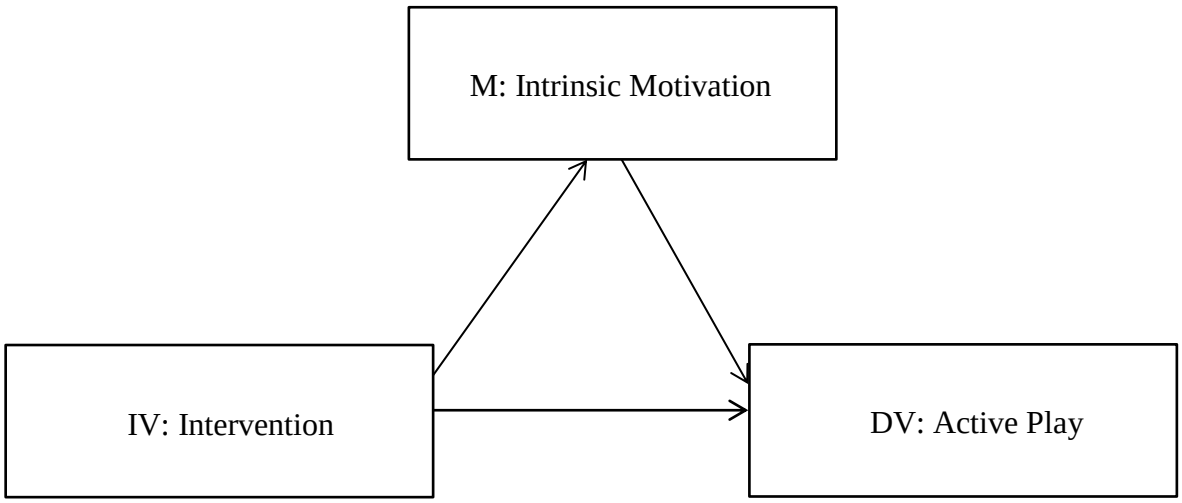

Figure 3. Mediation Analysis. The effect of the imagery intervention on active play with the hypothesized mediator (intrinsic motivation). *IV* Independent variable, *M* Mediator, *DV* Dependent variable

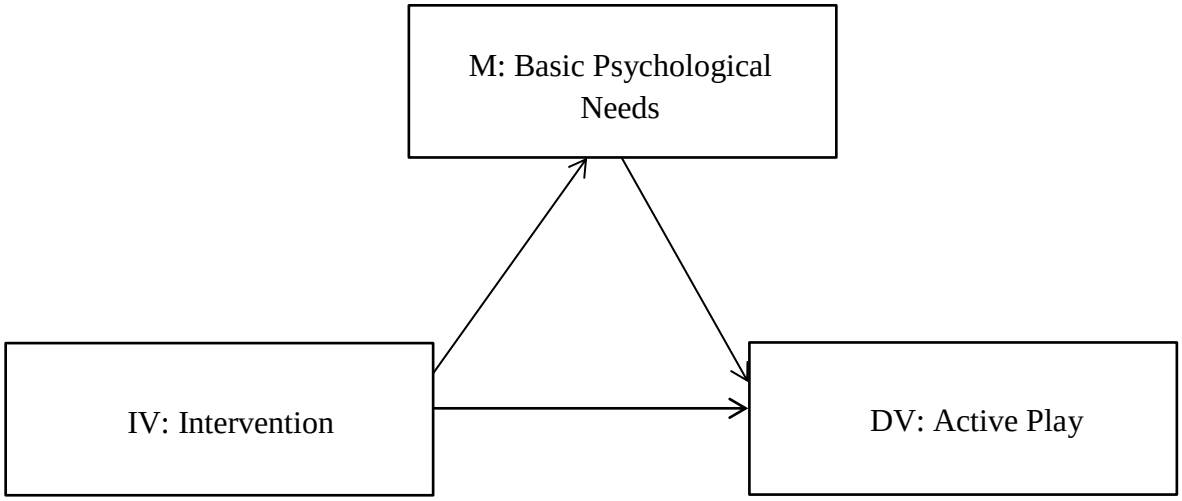

Figure 4 – Mediation Analysis. The effect of the imagery intervention on active play with the hypothesized mediator (basic psychological needs). *IV* Independent variable, *M* Mediator, *DV* Dependent variable

STUDY 3

Active Play Imagery: An 18-week Case Study

The World Health Organization and the Canadian Health Measure Survey state there are almost 1 million overweight children and 600, 000 obese school children in Canada (Statistics Canada, 2012). Physical inactivity has become a public health problem. For the ninth consecutive year, the physical activity (PA) levels amongst Canadian children do not meet the guidelines of 60 minutes of daily PA (Active Healthy Kids Canada [AHKC], 2014). PA provides numerous health benefits such as a decrease in the risk of type 2 diabetes and heart diseases (Lee, Shiroma, Lobelo, Puska, Blair, & Katzmarzyk, 2012). Furthermore, PA has been shown to increase self-esteem and active children are less likely to experience mental health problems (Biddle & Asare, 2011). Although the benefits are well established, the level of inactivity of children is prominent.

PA can be categorized as either structured or unstructured PA. Structured PA includes participating in organized PA such as playing on a sports team or participating in physical education classes in school. Contrarily, unstructured PA consists of PA done during one's leisure-time and by free choice. An example of unstructured PA is active play, which can be defined as "unstructured physical activity that takes place outdoors in a child's free time" (Veitch, Salmon, & Ball, 2008, p.870). According to Veitch and colleagues (2008) active play could be a potential avenue for children to get the recommended PA levels each day. Promoting opportunities for free and safe unstructured play may provide one of the most accessible and cost-effective solutions to aid in increasing Canadian children and youth's PA levels (AHKC, 2012). Thus, it is not surprising that researchers and policy makers have been increasingly interested in children's involvement in active play (AHKC, 2012), and strategies to promote it (Brockman, Jago, & Fox, 2010). A potential strategy that could lead to an increase in active play levels for children is imagery.

Imagery is the ability to create or recreate pictures in your mind. Imagery can serve both motivational and cognitive functions (Paivio, 1985). Hall (1995) was the first researcher to consider the use of imagery by exercisers. He proposed that exercisers may image themselves participating in PA, enjoying their workouts, and achieving workout goals. Exercise imagery

was examined in more detail by Hausenblas, Hall, Rodgers, and Munroe (1999) who determined that there were three main types of exercise imagery: technique, energy, and appearance imagery. Technique imagery refers to images related to exercise form (e.g., imaging doing the perfect moves), while energy refers to images related to energizing oneself (e.g., imaging exercise relieves stress). Appearance imagery refers to images of being healthy and improving physical appearance (e.g., imaging losing weight from exercising; Hausenblas et al., 1999). Technique imagery serves a cognitive function whereas energy and appearance imagery serve a motivational function (Hausenblas et al., 1999). Research has established that low-frequency exercisers use less imagery than high-frequency exercisers (Gammage, Hall, & Rodgers, 2000).

Given the use of exercise imagery by adults, it seems reasonable that children would also use imagery during their leisure-time physical activity. Qualitative research conducted with children 7-14 years old revealed that children used considerable active play imagery (Tobin, Nadalin, Munroe-Chandler, & Hall, 2013). Children were found to use active play imagery for various reasons such as imaging proper body position, being good at active play, and having fun with others (e.g., friends, family). Following this initial research, Cooke, Munroe-Chandler, Hall, Tobin, and Guerrero (2014) further examined children's active play imagery and identified three specific types: fun, social, and capability imagery. Fun imagery is defined as images associated with enjoyment and interest. Social imagery incorporates images associated with playing with others. Capability imagery includes images associated with feelings of competence.

When considering how imagery might serve as a mechanism to increase active play, imagery's motivation function is a prime candidate. One theory of motivation that is highly relevant in PA settings is self-determination theory (SDT; Deci & Ryan, 2002). SDT is a theory of human motivation that depicts motivation on a continuum, ranging from autonomous motives to controlling motives. Autonomous motives consist of intrinsic motivation, and two forms of extrinsic motivation, integrated regulation and identified regulation. Intrinsic motivation, the most self-determined form of motivation, is doing something out of pure interest or enjoyment of the activity. Integrated regulation is when an individual does something because it is seen as being part of the self. However, because the drive to do the behaviour is to gain a personal outcome, it is still seen as a form of extrinsic motivation. Identified regulation is doing something because it is important to you. Controlling motives include introjected regulation and

external regulation. Introjected regulation refers to partaking in an activity to avoid guilt or shame, and to increase one's ego and feelings of self-worth. External regulation is the least autonomous form of extrinsic motivation and is doing something to get a reward or to avoid punishment. Furthermore, the continuum includes amotivation which is a lack of motivation (Deci & Ryan, 2002). Research demonstrates that there are more beneficial consequences from autonomous regulations compared to controlling regulations. Autonomous motivation results in more positive behavioural, cognitive, and psychological outcomes (Deci & Ryan, 2002). In addition, autonomous motivation has been shown to be linked with behavioural persistence (Williams, Gagne, Ryan, & Deci, 2002).

A study conducted by Wilson, Sabiston, Mack, and Blanchard (2012) found that participants endorsed more self-determined motives than controlled motives for PA. People may exercise for both intrinsic and extrinsic reasons; however, people are more likely to adhere to exercise programs that they enjoy and find satisfying (Rodgers, Hall, Duncan, Pearson, & Milne, 2010). Recent research has found that enjoyment (i.e., intrinsic motivation) is an important factor in motivating individuals to be physically active (Aaltonen, Rottensteiner, Kaprio, & Kujala, 2014). Researchers have investigated the relationships between motivation and exercise imagery. More specifically, more self-determined motives were associated with both appearance and technique imagery, while less self-determined motives were associated with only appearance imagery (Wilson, Rodgers, Hall, & Gammage, 2003). Moreover, exercise imagery in general has been shown to be associated with more autonomous motives for exercise (Giacobbi, Dreisbach, Thurlow, Anand, & Garcia, 2014; Buman et al., 2011). A study by Giacobbi et al. (2014) examined the effects of peer-and theory based imagery on the self-determined motivation to exercise. It was found that the participants in the imagery group had a significantly greater increase in self-determined motivation towards exercise.

Given the research with adults outlining the associations between exercise imagery, motivation, and exercise participation, and the recent research on children's active play imagery, which examined whether an imagery intervention could increase children's active play levels (see Study 2). Their findings indicated that the participants in the imagery group were able to maintain their active play levels throughout the study while the control group significantly decreased their active play levels. While these results demonstrated that imagery can influence

children's active play levels, imagery did not increase active play as hypothesized (it only maintained it). Various explanations for these findings can be forwarded. The study was only a four week intervention and perhaps a longer intervention would actually increase active play levels. In addition, the imagery scripts incorporated fundamental movement skills, instead of actual active play activities. The imagery scripts were also exactly the same for each participant. Perhaps having individualized imagery scripts for each participant based on their favorite active play activities could help to make the imagery scripts more relatable to the participants.

Based on the previous study which demonstrated that an active play imagery intervention was able to maintain children's active play levels, it seems further research is needed. Therefore, the purpose of the present study was to examine if an 18 week active play imagery intervention could increase active play levels. Given the length and nature of the study, a case study methodology was chosen. A case study can be defined as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence" (Robson, 1993, p. 146). Case studies usually consist of collecting data during a baseline phase, and then again during the intervention phase, once the treatment has been implemented (Anderson, Miles, Mahoney, & Robinson, 2002). If there are changes in the data once the intervention has been implemented, it can be assumed that the intervention was responsible for that change (Anderson et al., 2002). Based on the previous research presented above, it was hypothesized that there would be an increase in active play levels during the intervention phase. Furthermore, it was hypothesized that these active play levels would be maintained throughout the post-intervention phase.

Method

Participants

A total of six female participants from grade 6 classes were recruited. Of the original six, three of the participants switched schools and could not continue to participate in the study, and one participant did not complete the study for lack of time. Therefore, a total of two participants remained in the study. Participant #2 was a 10 year old girl, whose favourite active play activities included swimming, dancing, squash, badminton, and bike riding. Participant #3 also was a 10 year old girl, whose favorite active play activities included swimming, bike riding, skipping, and playing tag.

Measures

Accelerometers. Actical Accelerometers were used to measure physical activity levels. The Actical accelerometer is a light (17 grams), durable, and waterproof device. Participants wore the accelerometers around their waist over their right hip. The Actical measures various types of PA (i.e., light, moderate, moderate-to-vigorous, and vigorous) done in a day. The PA outputs are presented in minutes. The Acticals were programmed based on the participant's age, sex, height, and weight. Participants were asked to wear the accelerometer every day for the duration of the study, except during organized sports, sleeping, or while showering. The accelerometers do not provide any information to the participants on their PA. Accelerometers are programmed for a specific time interval, called an epoch. Epochs may be set from 1 second to as high as several minutes (Rowlands, 2007). Previous research has often set the epoch at 1 minute for adults, although this can lead to underestimating activity levels in children (Trost, 2001). Given that children's PA is often done in frequent bursts and for short duration (Ward, Evenson, Vaughn, Rodgers, & Troiano, 2005), the epoch interval was set at 15 seconds for the present study. The cut points used for the accelerometers follows Puyau, Adolph, Vohra, Zakeri, and Butte (2004), which have been used in research studies with children.

Physical Activity Questionnaire for Older Children (PAQ-C). The PAQ-C was developed by Crocker, Bailey, Faulkner, Kowalski, and McGrath (1997) and measures children's physical activity levels on a 7 day recall. The instrument assesses general levels of physical activity. It is composed of 9 items reported on a 5 point scale (1=*none;* 5=*5 times last week*). An example item reads "In the last 7 days, on how many days right after school, did you do sports, dance, or play games in which you were very active?" In addition, the questionnaire asks participants to rate on a scale of 1 to 6 how many times they participated in a specific activity (e.g., tag, bicycling, basketball). Given that the present study examined specifically active play, the questions were slightly modified to be specific to leisure time physical activity. For example, the previously mentioned item was modified to "In the last 7 days, on how many days right after school, did you do active play in which you were very active". The PAQ-C has shown acceptable measurement properties and an alpha coefficient of .89, which is deemed adequate (Croker et al., 1997).

Situational Motivation Scale – Elementary School (SIMS). The SIMS-Elementary School (Guay, Vallerand, & Blanchard, 2000) is a 14 item questionnaire assessing four dimensions of motivation: intrinsic motivation, identified regulation, external regulation, and amotivation. The SIMS is scored on a 7 point Likert scale (1=*not at all;* 7=*exactly*). An example item of intrinsic motivation reads "Because I think this activity is enjoyable". An example item of identified regulation is "Because I believe this activity is important to me". An example item for external regulations reads "Because I feel that I have to do it". Finally, an example item for amotivation "I do this activity, but I am not sure it is a good thing". The amotivation subscale was not used; as active play is freely done, this subscale would not be relevant for this study. Acceptable Cronbach alphas (>.70) for all subscales have been shown in previous work (Standage, Treasure, Duda, & Prusak, 2003). For the purpose of this study, minor modifications were made to the SIMS following Guerrero, Tobin, Munroe-Chandler, and Hall (2015). The stem was modified to read "Why are you currently doing active play?" and items that included the phrase "this activity" were modified to read "active play". In addition, the seven response options were reduced to four ranging from 1 completely disagree to 4 completely agree. Previous research has noted that the type of labeling may influence response quality, with written labels more easily understood by children than numeric labels (Alwin & Krosnick, 1991). Research regarding questionnaire development for children has suggested that three or four response options are most appropriate when working with children under 11 years (Borgers & Hox, 2001).

Imagery Ability: Movement Imagery Questionnaire for Children (MIQ-C; Carter, Yoxon, Ste-Marie, Cumming, & Martini, 2012). The MIQ-C is comprised on 12 items designed to measure imagery ability. The questionnaire is divided into three imagery perspectives: kinesthetic, internal, and external. The questionnaire asks the participant to do four different movements and then imagine them three times (once for each perspective). They are to rate how easy or hard it was to feel (kinesthetic) the movement, see the movement through their own eyes (internal), or see it as though they were watching a video (external) of the movement. The MIQ-C is measured on a 7 point Likert scale (1=*very hard;* 7=*very easy*). Previous research has demonstrated the MIQ-C to have adequate internal reliability for all subscales (α's = > .70; Quinton et al., 2014).

Procedure

Ethical approval was obtained from the research ethics board at Western University. Following the ethics board's approval, the approval of the Thames Valley School board was obtained. Finally, approval was obtained from the principal of a school to recruit participants from that school. A package was sent home with students from the grade 6 class including the Letter of Information, Consent form, and Assent form. Once permission and consent was obtained from the parents and assent from the participants, the study began. The participants were asked to partake in an 18 week study. During week 1 of the study, the researcher met participants at their school and asked participants to complete the baseline testing. The participants were asked to complete the PAQ-C, the SIMS, and the MIQ-C. In addition to them completing the questionnaires, the participants were asked to list their favorite active play activities, why they enjoy those activities, where they usually played them, and with who they played the activities. This provided the necessary information to create individualized imagery scripts for each participant, based on their own favorite active play activities. Also, each participant received an accelerometer and were instructed on how to use the device (i.e., on/off button, hip placement). Participants wore the accelerometer during all waking hours except during organized sport or during physical education classes. Participants were given log sheets to indicate when they put on and took off the accelerometers. However, the response rate for submitting the log sheets was very poor, and no additional data could be used from them. The accelerometer data was collected weekly throughout the duration of the study during the participant's weekly meeting with the researcher.

The following week (week 2) the researcher met with the participants to collect the accelerometer data and had the participants complete the PAQ-C. Baseline testing continued for all participants during Weeks 2 and 3. The participants started the intervention phase of the study at different times (e.g., participant 2 started the intervention at week #4, while participant 3 started the intervention at week #5). Although they began at different times, the intervention was the same for all participants. During the intervention phase, the participants continued to wear the accelerometers every day and complete the PAQ-C on a weekly basis. In addition, they listened to an imagery script. The imagery scripts were recorded onto an mp3 player, and each participant got their own mp3 player. Over the course of the intervention phase, the participants were asked to listen to the imagery scripts during their weekly meeting with the researcher. In

addition, the participants were asked to listen to the imagery script two more times during the week on their own time. Every week during the intervention phase the participants were given a new imagery script. They listened to a total of eight imagery scripts. The length of the intervention phase was based on study 2 findings. Given that PA levels were maintained in study 2 after 4 weeks of imagery intervention, it was believed that having a longer intervention phase could increase the likelihood that participants would increase their PA levels. Once the eight week intervention phase was completed, the participants continued to meet with the researcher weekly. The first week of the post-intervention phase the participants completed the SIMS again. They also continued to complete the PAQ-C each week for the remainder of the study.

Imagery Scripts

The participants received eight imagery scripts throughout the intervention. The scripts were created following guidelines established by Cooley, Williams, Burns, and Cumming (2013). Before the study began, participants were asked to complete a questionnaire asking them about their favorite active play activities, why they enjoy them, where they liked to play them, and with who they played. This questionnaire allowed the research to write individualized imagery scripts based on the participants favorite activities (e.g., playing taerg, riding their bicycle, swimming). Research has shown that personalized imagery scripts from participants own experience leads to stronger visual and kinaesthetic imagery (Wilson, Smith, Burden, & Holmes, 2010). Given that fun is the most prominent reason for participating in PA for children (Brockman, Jago, & Fox, 2011) the imagery scripts also incorporated components of intrinsic motivation. In addition, based on previous findings (see study 1 and study 2) the imagery scripts also included components of the basic psychological needs (i.e., autonomy, competence, and relatedness). The imagery scripts were between four to five minutes long and changed every week for the eight weeks of the intervention phase. The length of the imagery scripts were based on comments from participants in Study 2. The imagery scripts were recorded and the recording was given to the participants each week.

Data Analysis

Although accelerometer data was collected 7 days a week for the 18 weeks, data were not included from all 7 days each week. Van Coevering, Harnack, Schmitz, Fulton, Galuska, and

Gao (2005) found that only 50% of children wore the accelerometers for 7 days straight, while 92% completed 3 days of continuous wear. In addition, research has shown that 4-5 days of monitoring is sufficient (Trost, Pate, Freesson, Sallis, & Taylor, 2000). Therefore, only 4 days of accelerometer data were used in the present study. The four days of data included one weekend day as that has been shown to be important (Trost et al., 2000). Although previous research states that data analysis should be done using valid days (i.e., 10 hours or more of wear time for 5 days; Trost, McIver, & Pate, 2005), for the present study that was not possible. Given that participants were asked to remove their accelerometers during organized sports and physical education, employing that restriction was not feasible. Furthermore, utilizing data from both valid and non-valid days diminished the risk of losing meaningful data (DeJesus, Fitzgeorge, McGowan, & Prapavessis, 2012). The present study examined moderate-to-vigorous physical activity (MVPA) minutes as well as light physical activity minutes.

Data analysis was conducted using the Kinesoft software (version 3.3.62), which was used to clean and sort all of the accelerometer data. In addition, IBM SPSS statistics (version 22) was used for analyzing the other variables in the study. The data analysis for the present study incorporated two different components. The first component was the visual analysis of the two graphs which contained the weekly moderate-to-vigorous physical activity (MVPA) minutes and the weekly light minutes for the entire intervention. These graphs were separated into three time points: baseline, intervention phase, and post-intervention. When examining the graphs, various components were taken into account. First, whether or not there was an increase immediately as the intervention phase began. Second, whether or not active play levels increased, decreased, or were maintained throughout the intervention phase. Finally, if active play levels increased, decreased, or were maintained during the post-intervention phase. This allowed a visual examination of any changes in the active play levels throughout the intervention. The second component was the examination of the means of active play minutes from all the time points were compared for both participants separately.

Results

Imagery Ability and Motivation

Means and standard deviations for imagery ability and motivation (baseline and post-intervention) are presented in Table 1. Both participants were found to have high imagery ability

on all three subscales (i.e., kinesthetic, internal, and external). In regards to motivation, three types of motivation were measured in regards to PA: intrinsic motivation, identified regulation, and external regulation. An increase was shown for participant 2 for both intrinsic motivation and identified regulation from baseline to post-intervention. In addition, a decrease was found from baseline to post-intervention for external regulation. In regards to participant 3, a slight increase was found for intrinsic motivation and integrated regulation. Furthermore, a slight decrease was found in terms of external regulation.

Active Play

Table 2 indicates the means and standard deviations (SD) for all of the MVPA active play minutes, light active play minutes, and the PAQ-C questionnaire for baseline, intervention phase, and post-intervention for both participants.

Participant 2

Figure 1 depicts participant 2's MVPA active play minutes. A difference can be seen from the baseline phase to the intervention phase. When looking at each phase, an increase can be seen from the beginning of the study throughout each phase. The mean at baseline was M = 32.68 (SD = 3.08) and increased during the intervention phase to M = 50.26 (SD = 9.36). This was an increase of 17.58 minutes of MVPA. Furthermore, from the intervention phase to post-intervention there was a further increase of 6.46 minutes. Importantly, when examining Figure 1 it is apparent that there was an immediate increase from baseline to the beginning of the intervention phase. These results indicate that the imagery intervention was able to increase the participant's active play levels. Furthermore, the post-intervention phase demonstrates stable MVPA levels. Therefore, even when the imagery intervention finished the participant was still able to maintain her active play levels.

Figure 2 demonstrates the trajectory of participant 2's light minutes of active play throughout the study. When examining the light active play minutes, an increase from baseline (M = 159.45) to intervention phase (M = 187.57), and again into post-intervention phase (M = 193.42) can be seen. Similar to MVPA minutes, there is an immediate effect of the intervention, which is seen by an increase at the start of the intervention phase. The increase from baseline to the intervention phase was of 28.12 minutes. In addition, the light active play minutes are maintained for the most part throughout the post-intervention phase. The self-reported results

from the PAQ-C support the accelerometer data. The PAQ-C results demonstrated an increase from baseline to intervention, as well as an increase in the post-intervention phase. The largest increase was from baseline to intervention, which follows the same pattern as the accelerometer data.

In regards to wear time, participant 2 wore her accelerometer for an average of 682.72 (*SD* = 70.78) minutes each day, which is approximately 11 hours. Their weekday average was 696.82 (*SD* = 71.81) minutes and weekend minutes 661.54 (*SD* = 175.01). Therefore, participant 2 wore her accelerometer often and for the majority of the day.

Participant 3

Figure 3 depicts the MVPA active play minutes for participant 3. The visual analysis of Figure 3 demonstrates that there was not a difference between the baseline phase and the intervention phase. The average of MVPA minutes during the baseline phase was *M* = 28.05 (*SD* = 9.60), while during the intervention phase the average was *M* = 26.37 (*SD* = 15.10). In addition, Figure 3 demonstrates the variability in participant 3's active play levels throughout the intervention phase. There is no consistency throughout this phase, therefore it cannot be concluded that the imagery intervention was successful. Furthermore, when examining the post-intervention phase, the active play levels were also highly variable.

Figure 4 depicts the light active play minutes for participant 3 throughout the study. When examining this graph it can be seen that this participant does not have consistent light minutes as the study progresses. The average at baseline was 113.31 minutes; however it decreases during the intervention phase to 72.88 minutes. Furthermore, the decrease in light minutes continues in the post-intervention phase. This again, demonstrates that the imagery intervention was not successful at increasing this participant's active play levels. When examining the scores from the PAQ-C, the results are a slightly different than the accelerometer data. The PAQ-C data demonstrate a very small increase from baseline to the intervention phase (from 2.24 to 2.32), followed with a larger increase in the post-intervention phase (from 2.32 to 3.44). These results would suggest that the participant's active play levels increased throughout the study.

Participant 3 wore their accelerometer for an average of 238.23 (*SD* = 182.54) minutes each day, which is approximately 4 hours. In regards to her wear time on weekdays, she wore the accelerometer for an average of 266.06 (*SD* = 209.37) minutes, while on weekend she wore the accelerometer for an average of 168.82 (*SD* = 261.21) minutes.

Discussion

The present study examined if an 18 week active play imagery study would help to increase children's active play levels. Two participants successfully completed the 18 week study and their results were presented. It was hypothesized that the participants would increase in their active play levels during the intervention phase, and that their active play levels would be maintained during post-intervention phase. The results partially supported our hypothesis.

The results from participant 2 indicated that the active play imagery intervention was successful in increasing her active play levels. An increase was shown in objectively measured active play at the start of the intervention. That is, once the participant began to listen to the imagery scripts her active play increased. This increase in active play was maintained throughout the intervention phase. In addition, this higher level of active play was maintained during post-intervention. Furthermore, the subjective measure of active play also demonstrated an increase in active play levels from baseline to post-intervention. These results support previous research which showed imagery increased exercise behaviour (Andersson & Moss, 2011). Furthermore, the results from participant 2 are supported by a previous study which found that a 4 week imagery intervention was able to maintain children's active play levels (see Study 2).

The imagery scripts in the present study were written to instill intrinsic motivation. Therefore, the present results are in accord with previous research with adolescents which found that autonomous motivation positively predicted self-reported exercise behaviour (Gillison, Standage, & Skevingtong, 2006). Furthermore, it supports research indicating autonomous motivation towards PA positively predicted pedometer step counts, as well as positive attitudes towards PA (Vierling, Standage, & Treasure, 2007). The results for participant 2 suggest that the imagery scripts were able to motivate her to be more physically active. People who image themselves doing certain behaviours are more likely to have those behaviours become a reality (Taylor, Pham, Rivkin, & Armor, 1998). In addition, the imagery scripts included components

of the basic psychological needs. Based on findings from previous research showing the effect of the basic psychological needs with PA (see study 2), could have instilled motivation to be more physically active.

Participant 2's results are particularly encouraging because she increased her active play levels during the winter months. Research has previously shown that weather plays an important role in dictating PA levels in children, and that PA levels typically decrease over winter months (Merrill, Shields, White, & Druce, 2005; Tucker & Gilliland, 2007). However, the results from the present study demonstrate that imagery may be an effective strategy in helping to increase the PA levels in children during this time of year.

Although positive results were found with participant 2, the same cannot be said for participant 3. Participant 3 did not show the anticipated results; no increase was found in her MVPA or light active play minutes from baseline to the intervention phase. When further examining this participant's data, more specifically her accelerometer wear time data, a potential explanation for her results can be forwarded. Participant 3 wore her accelerometer for an average of only 4 hours a day over the course of the study, which likely did not provide sufficient data to determine the effectiveness of the intervention. Given that the participants were asked to take off the accelerometers during organized sport, it is possible that participant 3 played more organized sport. However, an average of 4 hours a day does not constitute a full school day, therefore it is logical to presume that participant forgot to wear her accelerometer much of the time. Participant 3 began the study wearing the accelerometer fairly often and consistently, however as the study progressed she started to forget more and more often. Contrarily to her accelerometer data, participant 3's self-reported active play levels increased throughout the study. This suggests her accelerometer data may not have been an accurate reflection of her actual active play. Given participant 3's self-reported active play followed the same pattern as participant 2's self-reported active play; it is possible that the imagery intervention did have a positive influence on participant 3's active play.

Given the length of the study, the researcher was able to get to know the participants reasonably well. Therefore, anecdotal information gained by the researcher may help explain how one participant obtained the results expected with respect to the accelerometer data and one did not. Participant 2 was very eager about the study from the beginning. She always

remembered to bring her accelerometer (as she was always wearing it). She mentioned that she would sometimes forget to wear it on the weekends, but would remember most days during the week. Contrarily, participant 3 forgot to return her accelerometer from time to time, which meant she was not always wearing it. Participant 3 would mention that it was difficult to remember to wear the accelerometer every day. In terms of listening to the imagery scripts, participant 2 would mentioned that she would listen to it at home usually two more times, but on a couple of the week's only remembers to listen to it once at home. Participant 3 mentioned listening to the imagery script most weeks once at home, but indicated that a couple of weeks she forgot to listen to it at home. The participants also mentioned that they both liked the imagery scripts for the most part. They both mentioned that the imagery scripts were slightly long, therefore the imagery scripts were shorten for the last couple of weeks.

Although some of the results were encouraging, the limitations of the study provide some additional insight as to why stronger support for the imagery intervention was not obtained. First, the small number of participants was a limitation. The study originally had 6 participants, unfortunately 3 participants dropped out (because they changed schools) and one participant did not have sufficient data to be included in the study. Given that only two participants were included in the study limits the generalizability of the results. The second limitation was getting the participants to wear the accelerometers every day. The present study was 18 weeks in duration, which is a long time to expect 10 year old participants to remember to wear an accelerometer every day. This could have been seen as a burden for the participants, which seemed to be the case for participant 3 who decreased her wear time as the study progressed. Perhaps getting the parents involved might have been beneficial. Having reminder phone calls to the home to make sure the participants were wearing their accelerometers regularly also might have helped.

Although the present study did have certain limitations, it also had strengths that need to be brought forward. The first strength of this study is the fact that both objective and subjective measures of physical activity were employed. PA in children is often measured through self-reports by the children or parental self-report. Although those are reasonable methods, they can lead to recall and social desirability bias. Research has demonstrated that children do not always provide accurate data when self-reporting their PA behaviours (Welk, Corbin, & Dale, 2000).

Accelerometers provide valuable information on PA as they can provide information on the different intensities of PA (e.g., light, moderate, vigorous). Furthermore, the accelerometers used in this study were waterproof therefore could still calculate PA during water activities. The second strength of the study was the fact that it was a longitudinal intervention. Imagery interventions lasting 8 weeks are quite rare, yet research suggests longer imagery interventions are likely more beneficial (Cumming & Hall, 2002).

The present study provides us with encouraging results. One of the participants in this case study increased their active play levels during the imagery intervention phase. In addition, they were able to maintain those active play levels once the intervention was completed. Therefore, the active play imagery intervention was able to promote PA. Given the small number of participants it would be important to test this study again with a larger sample size. A potential future direction would be to apply imagery in schools. Given that children spend a large portion of their day in school, having imagery part of their everyday could help to increase their PA levels. Schools can provide various avenues for PA such as physical education classes, recess, and after school activities. Perhaps focusing on increasing PA levels during recess may be an avenue to pursue given that it is a time for children to play freely. Furthermore, research has shown that children spent less than 50% of recess being engaged in MVPA (Stratton, 2000). Therefore, if students would partake in imagery before their recess time it could help them to be more active. Even with the small sample size our results are encouraging and provide reason to believe that imagery may be an effective strategy to help increase children PA levels.

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Table 1

Descriptive Statistics for Imagery Ability and Motivation at Baseline and Post-Intervention

	Participants	*Baseline*	*Post*
Imagery Ability			
Kinesthetic	P2	6.50 *(.57)*	N/A
	P3	5.50 *(.57)*	N/A
Internal	P2	6.25 *(.95)*	N/A
	P3	6.00 *(1.41)*	N/A
External	P2	7.00 *(.00)*	N/A
	P3	6.25 *(.95)*	N/A
Motivation			
Intrinsic	P2	3.00 *(.00)*	4.00 *(.00)*
	P3	4.00 *(.00)*	4.00 *(.00)*
Identified	P2	2.67 *(.81)*	4.00 *(.00)*
	P3	3.67 *(.50)*	4.00 *(.00)*
External	P2	2.00 *(.57)*	1.50 *(.58)*
	P3	1.67 *(.57)*	1.50 *(.57)*

Note: Imagery ability is scored on a 7 point Likert scale; Motivation is scored on a 4 point scale

Table 2

Active Play Measures at Baseline, Intervention, and Post-Intervention Phase

	Participants	*Baseline*	*Intervention*	*Post-Intervention*
Physical Activity Questionnaire for Older Children	P2	2.70 *(.16)*	3.09 *(.27)*	3.15 *(.18)*
	P3	2.24 *(.36)*	2.32*(.36)*	3.44*(.25)*
Active Play MVPA minutes	P2	32.68 *(3.08)*	50.31 (*9.40)*	56.78 *(3.02)*
	P3	28.06 *(9.60)*	26.46 *(15.02)*	17.09 *(6.03)*
Active Play light minutes	P2	159.45 (19.67)	187.57 (18.13)	193.42 (13.90)
	P3	113.31 (52.23)	72.88 (44.98)	62.79 (36.14)

Note: The PAQ-C is scored on a 4 point scale

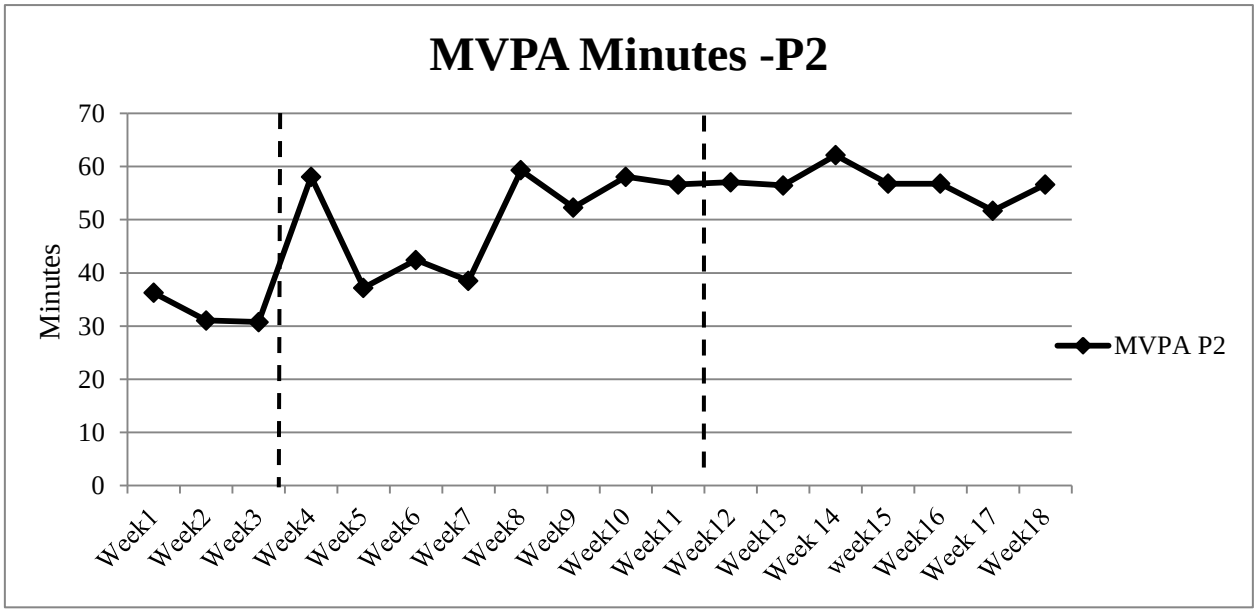

Figure 1 MVPA Minutes – P2. The figure depicts the moderate-to-vigorous physical activity minutes for participant 2.
Note: The dotted lines represent the different phases (i.e., baseline, intervention, and post-intervention)

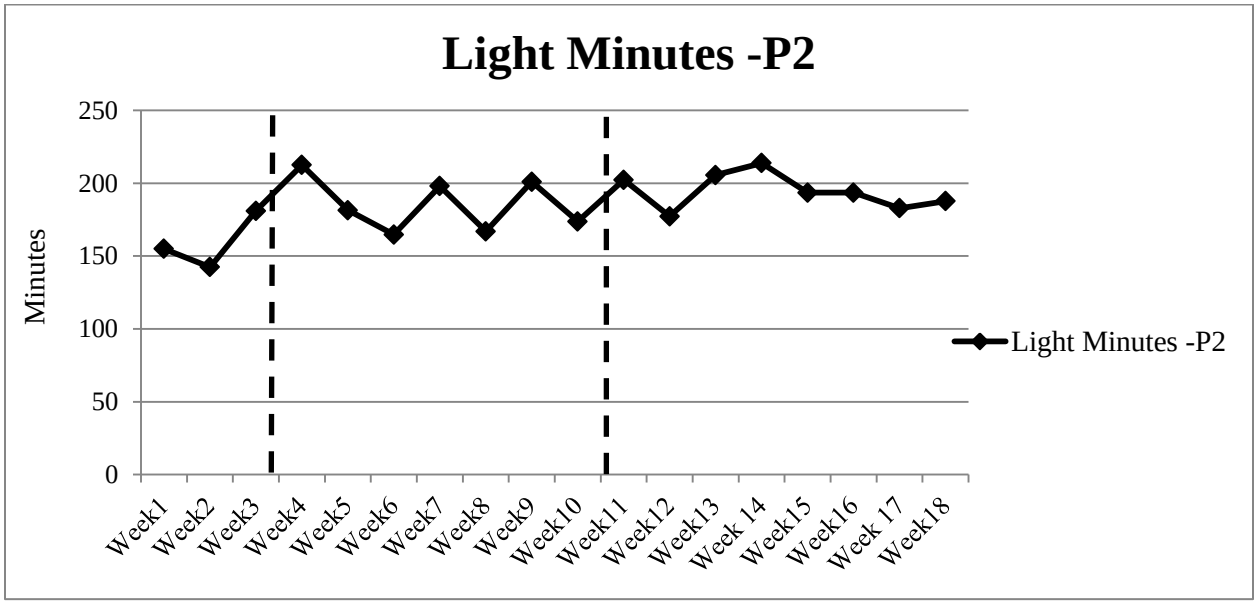

Figure 2 Light Minutes – P2. The figure represents the light active play minutes for participant 2. *Note:* The dotted lines represent the different phases (i.e., baseline, intervention, and post-intervention)

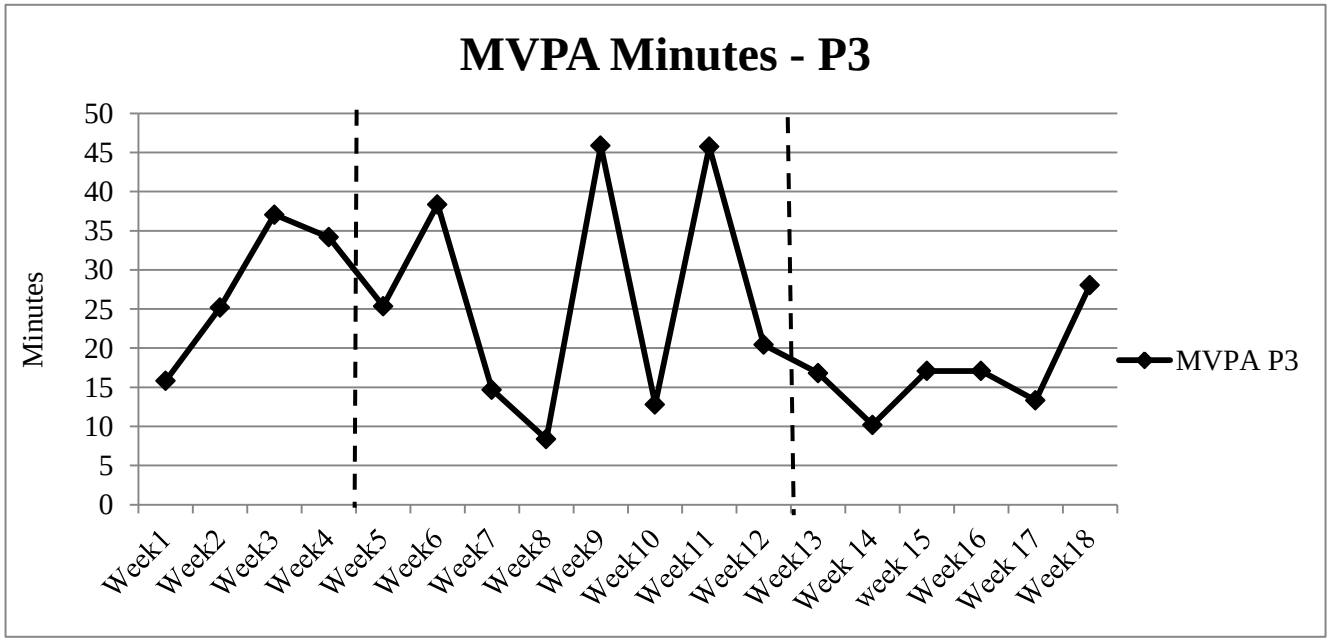

Figure 3 MVPA Minutes for participant 3. Figure 3 depicts the moderate-to-vigorous physical activity minutes for participants 3 in all three phases (i.e., baseline, intervention, and post-intervention). *Note:* the dotted lines represent the separation of the three phases

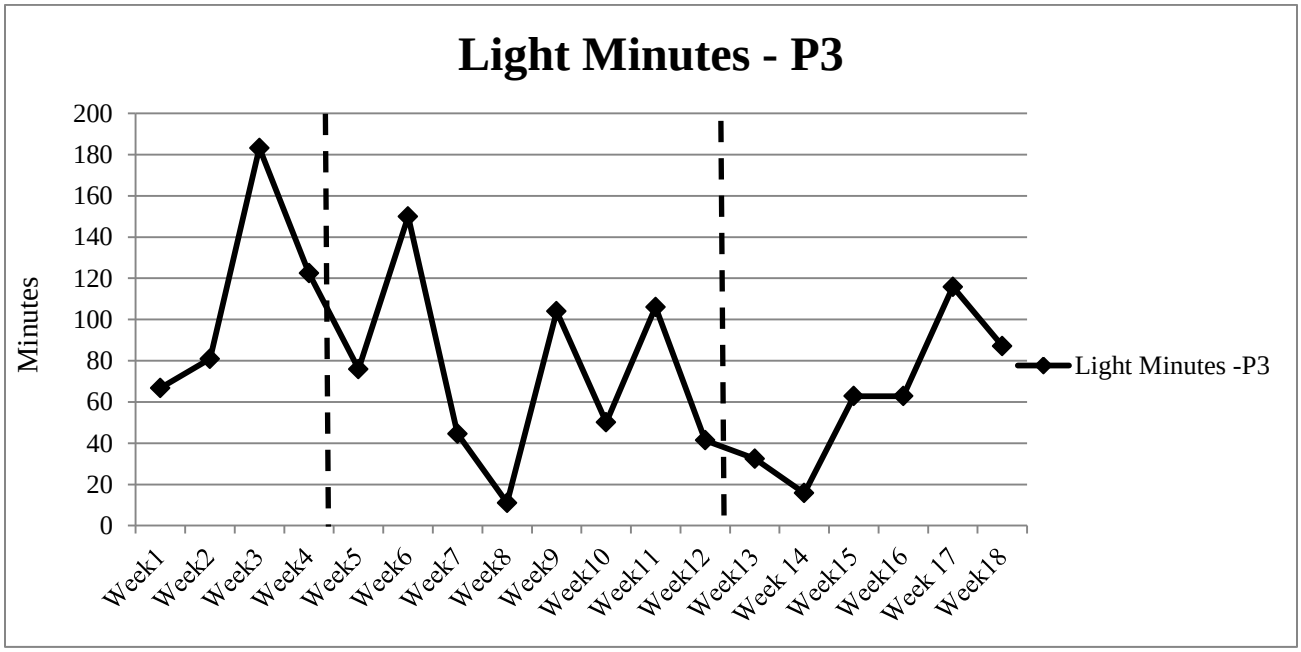

Figure 4 Light Minutes of participant 3. Figure 4 depicts the light active play minutes for participants 3 in all three phases (i.e., baseline, intervention, and post-intervention) *Note:* the dotted lines represent the separation of the three phases

SUMMARY, FUTURE DIRECTIONS, AND IMPLICATIONS

The purpose of the present dissertation was to examine more thoroughly how active play imagery could be used to help increase children's physical activity levels using SDT as the theoretical foundation.

Study 1 examined how the three different types of active play imagery (i.e., fun, social, and capability) were associated with the three basic psychological needs (i.e., autonomy, competence, and relatedness). Structural equation modelling was used to examine the relationship between the two concepts. The study proposed a unidirectional relationship between active play imagery and the basic psychological needs. However, an alternative model was also tested to see if children's use of active play is a consequence of their basic needs. The results of the hypothesized model (i.e., imagery →basic needs) demonstrated a positive relationship between capability imagery and perceived competence, social imagery and perceived relatedness, and fun imagery and perceived competence. In terms of the alternative model (i.e., basic needs → imagery) all three pathways were significant. However, it was found that the hypothesized model was more parsimonious than the alternative model. Therefore, the results indicated that all three imagery types were associated with two of the basic needs (competence and relatedness). These results will inform future research investigating active play imagery and employing SDT as the theoretical basis.

Study 2 investigated whether a six week active play imagery intervention could help to increase children's active play levels. The participants in this study were divided into two groups (imagery and control) and were asked to wear a pedometer for six weeks to measure their active play levels. The participants were asked to call into a telephone system to get either the imagery script or the short story (depending on their group). The results from the study demonstrated that the imagery group was able to maintain their active play levels throughout the study, while the control group significantly decreased their active play levels. The secondary purpose of the study was to examine if intrinsic motivation mediated the relationship between imagery and active play. The results indicated that the effect of the imagery intervention on active play was partially explained by intrinsic motivation. Furthermore, we also wanted to examine if the basic psychological needs mediated the relationship between the intervention and the active play levels. The results indicated that the basic psychological needs did in fact fully

mediate that relationship. This study provided very encouraging results and prompted the further examination of an active play imagery intervention on physical activity levels in the third study.

Study 3 was informed by the second study in a number of important ways. The imagery scripts were individualized to each participant based on their favorite active play activities. Personalized imagery scripts based on the individuals own experiences can lead to stronger imagery (Wilson, Smith, Burden, & Holmes, 2010). Also, active play was measured using accelerometers instead of pedometers, which allowed for comparison of different intensities of PA (i.e., light, moderate-to-vigorous). Finally, the intervention was lengthened. Given the length of the study, a case study approach was conducted. Two participants completed the 18 week study. The one participant showed an increase from baseline to the intervention phase in her active play levels. Furthermore, her active play levels were maintained throughout the post-intervention phase. In terms of the second participant, her accelerometer data did not show the anticipated results. When examining her accelerometer wear time, it was found that she often failed to wear her accelerometer. However, her self-reported physical activity measure showed the trend that was expected (i.e., increase from baseline to intervention and maintained in post-intervention). In summary, Study 3 provided some evidence that an active play imagery intervention can increase physical activity levels.

Overall these studies provide considerable insight about children's active play imagery. Although the results from the present studies provide some interesting findings, limitations must also be recognized. In regards to Study 1, the participants' imagery ability was not assessed. In addition, the questionnaire used to measure the basic psychological needs only measured one component of autonomy (i.e., perceived choice). In regards to Study 2 the short (i.e., 4 weeks) intervention was a limitation. In addition, the pedometers only measured step count and could not be used to assess activities such as bicycling or swimming. Finally, Study 3 had a small sample size which limits the generalizability of the findings. Furthermore, getting the participants to wear their accelerometers everyday was challenging.

Given that these studies provide encouraging results for active play imagery being able to increase children's active play levels, future directions for research warrant exploration. The participants in both intervention studies were fairly active children. Examining if the active play imagery intervention, which incorporated intrinsic motivation and the basic psychological needs,

would have the same effects on a non-active population should be explored. As shown with adults, regular exercisers and non-exercisers who do not intend to exercise had different associations between imagery and the different types of motivation (Hall, Rodgers, Wilson, & Norman, 2010). Therefore, it would be important to see if the differences exist between active children and non-active children. Perhaps imagery intervention for non-active children would have to be structured differently. A secondary avenue for future research could be to examine the ideal length of the imagery scripts. The participants in Study 3 mentioned the imagery scripts were slightly long. Hinshaw (1991) indicated that imagery scripts lasting under 1 minute or between 10-15 minutes were more effective than imagery scripts 3-5 minutes long. Research has also established that the length of the imagery script could depend on the images being visualized (Cooley, Williams, Burns, & Cumming, 2013). Given that children's PA is most often done spontaneously, intermittent, and highly transitory (Bailey, Olson, Pepper, Porzasz, Barstow, & Cooper, 1995), the shorter imagery scripts may provide positive results as well, and would be easier to administer on a regular basis.

The findings from this dissertation provide a new avenue to pursue for increasing children's PA levels. Children spend a significant amount of time at school (i.e., 7 hours a day, 5 days a week, 10 months of the year), thus the school system is a great way to reach a large number of children at once. Imagery scripts could be incorporated into children's school days, perhaps eventually being implemented into the school curriculum. Imagery scripts could be used to increase PA during the school day (e.g., during recess, physical education classes). Children are more active after a school day in which they were active (i.e., provided a chance to play outside during recess and physical education classes) compared to a school day in which they were not active (Dale, Corbin, & Dale, 2000). Implementing imagery as a regular component of a child's school day could help to increase PA not only during school hours but also outside of school.

The results from these studies present a step in the right direction for a new strategy to increase children's PA levels. It is no secret that Canadian children are not physically active. This dissertation suggests a new avenue to promote physical activity, active play imagery. Incorporating both intrinsic motivation as well as components of the basic psychological needs into the imagery scripts is also important. In the exercise domain, individuals are more likely to

sustain exercise behaviour if they participate in the activity for autonomous reasons (Ryan & Deci, 2007). Children have vivid imaginations. If we can harness their imaginations, numerous benefits including increasing their active play may be realized.

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APPENDICES

APPENDIX A

Children's Active Play Imagery Questionnaire

Studies 1 and 2

Children's Active Play-Imagery Questionnaire

These questions ask how you use **IMAGERY** (make pictures in your mind) when doing **ACTIVE PLAY** (get your body moving when you are playing). Remember, active play does **NOT** mean organized sport like playing on a hockey team or competing for a gymnastics club.

1. When thinking about active play, I imagine the moves that are needed.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often

2. When thinking about active play, I imagine joining in with others.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often

3. When thinking about active play, I picture myself having fun.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often

4. When thinking about active play, I imagine the positions of my body.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often

5. When thinking about active play, I see myself with my friends.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often

6. When thinking about active play, I imagine the fun I have.

A. Not at all
B. A little bit
C. Sometimes
D. Often
E. Very often

7. When thinking about active play, I picture myself doing it in a group.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often
8. When thinking about active play, I imagine enjoying myself.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often
9. When thinking about active play, I imagine the movements that my body makes.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often
10. When thinking about active play, I imagine my friends with me.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often
11. When thinking about active play, I imagine how my body moves.
    A. Not at all
    B. A little bit
    C. Sometimes
    D. Often
    E. Very often

APPENDIX B

Basic Need Satisfaction for Physical Activity

Study 1

BNS - PA

The questions ask you how you feel when doing active play. Active play can be riding your bike, dancing, playing tag, kicking a ball, or going swimming with friends. It makes you sweat, makes your legs feel tired, or makes you breathe harder.

Read each question. If you agree a lot with it, circle a higher number. If you do not agree with it, circle a lower number.

	Do not Agree At All		**Slightly Agree**		**Agree**		**Strongly Agree**
I am good at active play.	1	2	3	4	5	6	7
I choose what I am going to do for active play.	1	2	3	4	5	6	7
During active play I get along with the people I play with.	1	2	3	4	5	6	7
I do well in active play when compared to others.	1	2	3	4	5	6	7
During active play, I do what I want to do.	1	2	3	4	5	6	7
The people who I do active play with are my friends.	1	2	3	4	5	6	7

	Do not Agree At All		**Slightly Agree**		**Agree**		**Strongly Agree**
I've got a lot of skill when doing active play.	1	2	3	4	5	6	7
When I am doing active play, I can really do what I want.	1	2	3	4	5	6	7
When doing active play, it is with my buddies.	1	2	3	4	5	6	7

I like the kids who do active play with me.	1	2	3	4	5	6	7
I am able to complete active play that is hard.	1	2	3	4	5	6	7

	Do Not Agree At All		**Slightly Agree**		**Agree**		**Very Strongly Agree**
I am skilled at active play.	1	2	3	4	5	6	7
I decide what I want to do for active play.	1	2	3	4	5	6	7
I feel good about my ability to do active play.	1	2	3	4	5	6	7
I am able to do active play in any way I want.	1	2	3	4	5	6	7
The kids I do active play with are my pals.	1	2	3	4	5	6	7

APPENDIX C

Modified Basic Need Satisfaction in Physical Activity Study 2

Basic Need Satisfaction in Physical Activity

The questions ask you how you feel when doing active play. **Active play** can be riding your bike, dancing, playing tag, kicking a ball, or going swimming with friends.

1. I am good at active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

2. I choose what I am going to do for active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

3. During active play, I get along with the people I play with.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

4. I do well in active play when compared to others.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

5. During active play, I do what I want to do.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

6. The people who I do active play with are my friends.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

7. I've got a lot of skill when doing active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

8. When I am doing active play, I can really do what I want.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

9. When doing active play, it is with my buddies.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

10. I like the kids who do active play with me.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

11. I am able to complete active play that is hard.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

12. I am skilled at active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

13. I decide what I want to do for active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

14. I feel good about my ability to do active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

15. I am able to do active play in any way I want.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree

D. Completely agree

16. The kids I do active play with are my pals.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

APPENDIX D

Situational Motivation Scale

Studies 2 and 3

Situational Motivation Scale

Why are you currently doing active play?

1. Because I think that active play is interesting.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

2. Because I am doing it for my own good.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

3. Because I am suppose to do it.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

4. Because I think that active play is enjoyable.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

5. Because I think that active play is good for me.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree
6. Because it is something that I have to do.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

7. Because active play is fun.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

8. By personal decision.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

9. Because I don't have a choice.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

10. Because I feel good when doing active play.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

11. Because I believe that active play is important for me.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

12. Because I feel that I have to do it.
    A. Completely disagree
    B. Kinda disagree
    C. Kinda agree
    D. Completely agree

APPENDIX E

Physical Activity Questionnaire for Older Children

Study 2

PHYSICAL ACTIVITY QUESTIONNAIRE

We are trying to find out about your level of physical activity from the last 7 days (in the last week). These include sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

- **There are no right or wrong answers- this is not a test.**
- Please answer all the questions honestly and accurately as you can- this is very important.

---

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Check mark only one box per row)

	No	1-2	3-4	5-6	7 times or more
Skipping					
Rowing/canoeing					
In-line skating					
Tag					
Walking for exercise					
Bicycling					
Jogging or running					
Aerobics					
Swimming					
Baseball, softball					
Dance					
Football					
Badminton					
Skateboarding					

	No	1-2	3-4	5-6	7 times or more
Soccer					
Street hockey					
Volleyball					
Floor hockey					
Basketball					
Ice skating					
Cross-country skiing					
Ice hockey/ringette					
Other: _____					

2. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing heard, running, jumping, throwing) (Check one only)

A. I don't do PED
B. Hardly ever
C. Sometimes
D. Quite often
E. Always

3. In the last 7 days, what did you do most of the time at *recess*? (Check one only.)

A. Sat down (talking, reading, doing schoolwork)
B. Stood around or walked around
C. Ran or played a little bit
D. Ran around and played quite a bit
E. Ran and played hard most of the time

4. In the last 7 days, what did you normally do at *lunch* (besides eating lunch)? (Check one only.)

A. Sat around (talking, reading, doing schoolwork)
B. Stood around or walked around
C. Ran or played a little bit
D. Ran or played a quite bit
E. Ran and played hard most of the time

5. In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)

A. None
B. 1 time last week
C. 2 or 3 times last week
D. 4 times last week
E. 5 times last week

6. In the last 7 days, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)

A. None
B. 1 time last week
C. 2 or 3 times last week
D. 4 or 5 times last week
E. 6 or 7 times last week

7. *On the last weekend*, how many times did you do sports, dance, or play games in which you were very active? (Check one only).

A. None
B. 1 time
C. 2-3 times
D. 4-5 times
E. 6 or more times

8. Which one of the following describes you best for the last 7 days? Read all five statements before deciding on one answer that describes you. (Check one only.)

1. All or most of my free time was spent doing things that involve little physical effort
2. I sometimes (1-2 times last week) did physical things in my free time (e.g., played sports, went running, swimming bike riding, did aerobics)
3. I often (3-4 times last week) did physical things in my free time
4. I quite often (5-6 times last week) did physical things in my free time
5. I very often (7 or more times last week) did physical things in my free time

9. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

10. Were you sick last week, or did anything prevent you from doing your normal physical activity? (Check one.)

A. Yes
B. No

If yes, what prevented you?

_____

APPENDIX F

Movement Imagery Question for Children

Study 2 and 3

Movement Imagery Questionnaire for Children

Instructions: We want to know about the ways that movements can happen in your head. We want to know how hard or easy it is for you to see or feel different movements in your head.

First, we will ask you to do a movement.

Then, we will ask you to do one of three things in your head, without moving any part of your body.

The three things we will ask you to do are:

1. **See** yourself doing the movement through **your own eyes**
2. **See** yourself doing the movement as if you are **watching it on video**
3. **Feel** yourself doing the movement in your head

Before we get started, we will do an example to help you understand the three things we will ask you to do.

Anytime you do not understand anything, just ask!

Use this scale to tell us how easy or hard it is to see or feel the movements in your head:

Very hard to see

Not easy nor hard

Very easy to see

1	2	3	4	5	6	7
Very Hard	Hard	Kind of Hard	Not Easy nor Hard	Kind of Easy	Easy	Very Easy

ITEMS: We will ask you to do 4 different movements and imagine them 3 times each. For each item, rate how easy it is to do or see the movement by **circling** the number that best represents your experience.

1. Starting position for this action is:

   Stand with your feet and legs close together and your arms at your sides.

   The movement to do is:
   Lift your right knee as high as you can. Bring it back down slowly until your two feet are on the ground. Make sure you do it slowly.

   Get into the starting position.

   In your head:
   Try **feeling** the knee lifting movement you just did, as if you were actually doing it, but without moving any part of your body.

   Rate how easy or hard it was to **feel** this:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

2. The starting position for this action is:

   Stand with your feet and legs close together and your arms at your sides

   The movement to do is:
   Bend down low and then jump in the air as high as you can, with your arms up over your head. Land with your feet apart and bring your arms back down.

   Get into the starting position.

   In your head:
   Try to **see** the jumping movement you just did **through your own eyes**, like what you would see if you were actually doing it.

   Rate how easy or hard it was to **see** this **through your own eyes**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

3. The starting position for this action is:

   Which arm do you write with? Now take the other arm and stretch it out to your side so the palm of your hand is facing the floor.

   The movement to do is:
   Keep your arm stretched out, and move it from your side to in front of you. Do this slowly.

   Get into the starting position.

   In your head:
   Try to **see** the movement you just did of your arm moving to the front, as if you were **watching yourself on video**.

   Rate how easy or hard it was to **see** this as if you were **watching yourself on video**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

4. The starting position for this action is:

   Stand with your feet apart and your arms stretched out all the way above your head.

   The movement to do is:
   Slowly bend your body forward and try to touch your toes with your fingertips. Now, stand back up with your arms above your head.

   Get into starting position.

   In your head:
   Try f**eeling** the bending movement you just did, as if you were actually doing it, but without moving any part of your body.

   Rate how easy or hard it was for you to **feel** this:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

5. The starting position for this action is:

   Stand with your feet and legs close together and your arms at your sides

   The movement to do is:
   Lift your right knee as high as you can. Bring it back down slowly until your two feet are on the ground. Make sure you do it slowly

   Get into the starting position.

   In your head:
   Try to **see** the knee lifting movement you just did **through your own eyes**, like what you would see if you were actually doing it.

   Rate how easy or hard it was to **see** this **through your own eyes**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

6. The starting position for this movement is:

   Stand with your feet and legs close together and your arms at your sides

   The movement to do is:
   Bend down low and then jump in the air as high as you can, with your arms up over your head. Land with your feet apart and bring your arms back down.

   Get into the starting position.

   In your head:
   Try to **see** the jumping movement you just did as if you were **watching yourself on video**.

   Rate how easy or hard it was to **see** this as if you were **watching yourself on video**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

7. The starting position for this action is:

   Take the arm that you do not write with, and stretch it out to your side so the palm of your hand is facing the floor.

   The movement to do is:
   Keep your arm stretched out, and move it from your side to in front of you. Do this slowly.

   Get into the starting position.

   In your head:
   Try to **feel** the movement you just did of your arm moving to the front, as if you were actually doing it, but without moving any part of your body.

   Rate how easy or hard it was to **feel** this:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

8. The starting position for this action is:

   Stand with your feet apart and your arms stretched out all the way above your head.

   The movement to do is:
   Slowly bend your body forward and try to touch your toes with your fingertips. Now, stand back up with your arms above your head.

   Get into the starting position.

   In your head:
   Try to **see** the bending movement you just did **through your own eyes**, like what you would see if you were actually doing it.

   Rate how easy or hard it was to **see** this **through your own eyes**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

9. The starting position for this action is:

Stand with your feet and legs close together and your arms at your sides

The movement to do is:
Lift your right knee as high as you can. Bring it back down slowly until your two feet are on the ground. Make sure you do it slowly

Get into the starting position.

In your head:
Try to **see** the knee lifting movement you just did as if you were **watching yourself on video**.

Rate how easy or hard it was to **see** this as if you were **watching yourself on video**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

10. The starting position for this action is:

Stand with your feet and legs close together and your arms at your sides

The movement to do is:
Bend down low and then jump in the air as high as you can, with your arms up over your head. Land with your feet apart and bring your arms back down.

Get into the starting position.

In your head:
Try **feeling** the jumping movement you just did, as if you were actually doing it, but without moving any part of your body.

Rate how easy or hard it was to **feel** this:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

11. The starting position for this action is:

Take the arm that you do not write with, and stretch it out to your side so the palm of your hand is facing the floor.

The movement to do is:
Keep your arm stretched out, and move it from your side to in front of you. Do this slowly.

Get into the starting position.

In your head:
Try to **see** the movement you just did of your arm moving toward the front **through your own eyes**, like what you would see if you were actually doing it.

Rate how easy or hard it was to **see** this **through your own eyes**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

12. The starting position for this action is:

Stand with your feet apart and your arms stretched out all the way above your head.

The movement to do is:
Slowly bend your body forward and try to touch your toes with your fingertips. Now, stand back up with your arms above your head.

Get into the starting position.

In your head:
Try to **see** the bending movement you just did as if you were **watching yourself on video**.

Rate how easy or hard it was to **see** this as if you were **watching yourself on video**:

1 Very hard	2 Hard	3 Kind of Hard	4 Not Easy nor Hard	5 Kind of Easy	6 Easy	7 Very Easy

APPENDIX G

Modified Physical Activity Questionnaire for Older Children

Study 3

Physical Activity Questionnaire for Older Children

We are trying to find out about your level of physical activity from the last 7 days (in the last week). These include activities that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

- **There are no right or wrong answers- this is not a test.**
- Please answer all the questions honestly and accurately as you can- this is very important.

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Check mark only one box per row)

	No	1-2	3-4	5-6	7 times or more
Skipping					
Rowing/canoeing					
In-line skating					
Tag					
Walking for exercise					
Bicycling					
Jogging or running					
Aerobics					
Swimming					
Baseball, softball					
Dance					
Football					
Badminton					
Skateboarding					
Soccer					

Street hockey					
Volleyball					
Floor hockey					
Basketball					
Ice skating					
Cross-country skiing					
Ice hockey/ringette					
Other: _____					

2. In the last 7 days, what did you do most of the time at *recess*? (Circle one only.)
   F. Sat down (talking, reading, doing schoolwork)
   G. Stood around or walked around
   H. Ran or played a little bit
   I. Ran around and played quite a bit
   J. Ran and played hard most of the time

3. In the last 7 days, what did you normally do at *lunch* (besides eating lunch)? (Circle one only.)
   F. Sat around (talking, reading, doing schoolwork)
   G. Stood around or walked around
   H. Ran or played a little bit
   I. Ran or played a quite bit
   J. Ran and played hard most of the time

4. In the last 7 days, on how many days *right after school*, did you do active play or play games in which you were very active? (Circle one only.)
   F. None
   G. 1 time last week
   H. 2 or 3 times last week
   I. 4 times last week
   J. 5 times last week

5. In the last 7 days, on how many *evenings* did you do active play or play games in which you were very active? (Circle one only.)
   F. None
   G. 1 time last week
   H. 2 or 3 times last week
   I. 4 or 5 times last week

J. 6 or 7 times last week

6. *On the last weekend*, how many times did you do active play or play games in which you were very active? (Circle one only).

F. None
G. 1 time
H. 2-3 times
I. 4-5 times
J. 6 or more times

7. Which one of the following describes you best for the last 7 days? Read all five statements before deciding on one answer that describes you. (Circle one only.)

6. All or most of my free time was spent doing things that involve little physical effort
7. I sometimes (1-2 times last week) did physical things in my free time (e.g., went running, swimming bike riding, did aerobics)
8. I often (3-4 times last week) did physical things in my free time
9. I quite often (5-6 times last week) did physical things in my free time
10. I very often (7 or more times last week) did physical things in my free time

8. Mark how often you did physical activity (like playing games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

9. Were you sick last week, or did anything prevent you from doing your normal physical activity? (Check one.)

C. Yes
D. No

If yes, what prevented you?

APPENDIX H

Imagery Scripts

Study 2

Imagery Script 1 – Intervention Group

Before we begin I want you to find a quite place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

When you picture things in your mind like your bed in your bedroom, you are using imagery. You can even use imagery to picture things when you are playing –like seeing yourself playing tag with friends or biking in the park with your pals. Active play can include things like swimming, playing catch, kicking a ball around, shooting pucks at a net, and dancing. So imagery is when you picture things in your mind and active play is when you are moving your body.

I want you to imagine yourself playing with your pals in the park. It's a bright and sunny day with a light breeze. It's a great day for playing because the temperature is not too hot and not too cold, it is just perfect. You can feel the wind against your back and smell the freshly cut grass beneath your feet. Picture you and your friends kicking a soccer ball to each other. Picture your one friend is being the goalie and the net is two trees in the park. Picture yourself moving quickly up to the ball and kicking it towards your one friend. Your friend stops the ball with their foot and kicks it back to you. Think about how much fun you are having with your friends. Imagine you and your friends are laughing really hard together as you play. Imagine how much fun it is to be outside and playing with your friends. Think of the feelings you get when you're having a really good time with your friends. Imagine all of you laughing together and enjoying playing together. Think of how much fun it is to kick the ball to your friends. Think of the joy you feel being with all your friends. Think of all the good feelings you have when playing with them.

Now picture yourself playing with two of your friends. Picture the three of you throwing a ball around to each other. Picture yourself winding up and throwing the ball to of your buddies. Think of the joy you feel when playing with those two friends. Now I want you to picture two more of your buddies coming to join you. You are excited to see your friends and think of how excited you are to play with them. There are now five of you playing together. All five of you are taking turns throwing the ball back and forth. Imagine how happy you all are playing together. You are having even more fun now that more friends have come to play. It is more fun with more people. Everyone is laughing and playing together. Think of how being with your friends makes you feel. You feel happy, you feel cheerful and you feel good to be playing with your friends.

Now picture yourself at the end of the day, once you've finished playing with your pals. Think back to all the fun you had and how great the time playing with your friends was. Think of the joy you felt when you were throwing and kicking a ball with your friends. Picture how much you and your friends laughed and how much fun you all had together throughout the whole day.

Imagine how happy you felt kicking and throwing with your friends and how much you can't wait to play with them again. You are looking forward to the next time you get to play and laugh with your pals.

Imagery Script 2

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

I want you to picture where your desk is located in your classroom. Can you picture it? Where is it located in the classroom? Who are you sitting next to? Now, I want you to change the picture in your mind to your bedroom. Be aware of all your things in your bedroom- like your clothes or your bed, or even a particular book sitting on your bookshelf. When you picture things in your mind like your desk at school or your bedroom at home, you are using imagery. You can even use imagery to picture things when you are playing - like seeing yourself playing tag with your friends or going for a bike ride with your friends. So imagery is when you picture things in your mind and active play is when you are moving your body. Active play can include things like skipping, swimming, kicking a ball around, or dancing. Remember, active play does not mean organized sport like playing on a hockey team or competing for a gymnastics club.

I want you to imagine yourself playing with your pals at a park. It's a bright and sunny day with a light breeze. It's a great day to do active play because it's the perfect temperature. You can feel the wind against your back and smell the freshly cut grass beneath your feet. Picture you and your friends taking turns jumping off a big rock at the park. Think about how much fun you are having with your friends. Imagine some of your friends making silly poses as they fly through the air and land on the grass. Imagine you and your friends are laughing really hard together. Imagine the sound of your friends laughing together. Think of the feelings you get when you are having a really good time with your friends. Just thinking about you and your friends playing together make you happy. Now I want you to imagine you and your friends jumping off one rock and onto another. Think about yourself connecting with all of your friends as do different activities together. Picture you and your friends sharing funny stories with each other as you play. Think of how you glad you are to be able to share stories with your friends and how much fun you have together. Think about how much you enjoy your friends company and how much they enjoy your company. Picture how good it feels to have great friends you can play with. Think about how you feel when you’re with your friends: you feel cheerful, and happy, and you’re glad to know you and your friends enjoy the same activities.

Now I want you to imagine you and two of your friends running together at the park. Imagine how much fun you are having with your two pals. You and your friends are laughing and smiling as you run around having fun. Now, I want you to picture two more friends come to join you. Now you and four other friends are playing together. Think of how happy you are to see everyone and how excited you are to play with everyone. All five of you are happy to be playing together. You are having even more fun with everyone together. Think about how happy being with those friends’ makes you feel. You enjoy playing with your friends because you get along with your friends and like the same things. Think about the joy you feel when playing with your

pals. Let yourself feel all sensations you get when you play with your friends. Feel the happiness and the joy. The more you let yourself feel the sensations of happiness and joy, the more you want to play with your friends.

Now imagine yourself at the end of the day after playing with your friends. Think about how much fun you had with your friends at the park and in the swimming pool. You enjoy that your friends like to jump, run, and swim as much as you do. Imagine how it feels to do active play with your friends. You look forward to the next time you do active play so you can laugh and play with your pals.

Imagery Script 3

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

I want you to picture where your desk is located in your classroom. Do you see it? Now, I want you to picture your bedroom. Be aware of all your belongings in your bedroom- like your closet or your bed, or even a particular book sitting on your bookshelf. When you picture things in your mind like your desk at school or your bedroom, you are using imagery. You can even use imagery to picture things when you are playing - like seeing yourself running quickly in tag or imagining how your legs move when you are riding your bike. If you are moving your body, you are doing active play. Active play activities can be skipping, swimming, kicking a ball around, or freely dancing. Remember, active play does not mean organized sport like playing on a hockey team or competing for a gymnastics club.

I want you to imagine yourself at a park. It's a bright sunny day with a strong breeze. It's a great day to do active play because it's the perfect temperature. As the wind crashes against the back side of your body you can smell the freshly cut grass beneath your feet. The active play activity you choose to do is jumping. Imagine yourself in the perfect position just about to take your first jump. Your feet are squashed tightly together...your legs are slightly bent...your upper body is titled forward...your arms are placed gently at your sides...your shoulders are relaxed and your head is facing forward. You are ready to jump. Imagine your legs pushing off the ground and your arms swinging up into the air, towards the clear blue sky. Imagine yourself softly landing on the grass. You continue to jump and jump because you feel skilled and confident. Imagine your movements are smooth, consistent, and effortless. Now picture yourself completing difficult jumps...others can see how confident and comfortable you. Feel the sense of accomplishment, the feelings of happiness and confidence, the feelings that you can do this with ease. Imagine how proud you are about your ability to do active play so well.

Imagine yourself feeling so good at jumping you want to do another active play activity...like running. As you begin to start running you enjoy the strong breeze brushing up against your face. Feel the grass being torn up beneath you as your feet push hard off the ground. Be aware of how perfect your movements are. Imagine yourself being very skilled at running. Feel your legs muscles working hard with each stride. As you begin to feel more and more confident you start to quickly dash through objects at the park. Picture yourself darting through a row of small trees. You know in your mind you can do active play that it is hard...like running quickly through obstacles at the park. Let yourself feel the success, the joy, and the happiness.

Now, I want you to imagine yourself slowing down from running and beginning to skip. Be aware of how your body movements change as you move from running to skipping. Focus on your body: it's comfortable, relaxed, and balanced. Think about how good you feel to be skilled and confident at another active play activity, such as skipping. Picture yourself skipping around the park...other people notice how skilled you are. Just by looking at your body movements and your face...they see you are confident and talented. Imagine how satisfied you are with your active play skill level. Let yourself feel how proud you are about your ability to do active play so well.

Now I want you to imagine what your body feels like while you are jumping, running, and skipping. Picture your body feeling strong and energetic...you feel like you could keep going and going without stopping. Imagine what your heart looks like as it begins to beat faster and faster as you move quicker and quicker. You notice you are beginning to breathe harder. Imagine your chest as a balloon. It quickly fills with air as you take a deep breath in and quickly deflates as you breathe out. Be aware of these positive messages your body is sending to you. Imagine your body enjoying the feeling of when you jump, run, and skip.

Now imagine yourself cooling down after successfully completing these active play activities. As you walk around the park, still enjoying the beautiful weather, reflect on how you feel...be aware of how successful you at completing this active play activities. You feel satisfied and happy. You look forward to the next time you do active play.

Imagery Script 4

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Remember, when you picture things in your mind, like chasing your friends at the park or walking your dog, you are using imagery. Active play is when you move your body. Active play activities include things like swimming, playing balance games, kicking a ball around, or dancing. Remember, active play is activities you do on your free time. This does not mean playing on a soccer or hockey team.

I want you to imagine yourself in your backyard. The sky is filled with big white fluffy clouds and parts of the grass is covered with colourful leafs. You feel the warmth of the sun against your skin as it pops out from behind the clouds once and awhile. Imagine yourself feeling excited to move your body after a long day at school. Now, I want you to picture a ball sitting on the ground about two car lengths in front of you. Feel your shoulders rise as you take a deep breath and start to run quickly towards the ball. Imagine how good you feel because you are doing an active play activity you like so much. Imagine yourself taking a long step or a leap just before you make contact with the ball. Picture your non-kicking foot is placed slightly behind the ball. Now, picture your kicking foot swinging back behind your body, your leg muscles contracting and, with full force, you kick the ball with the shoelace area of your foot. Picture yourself feeling comfortable and confident at kicking. Picture all the perfect movements your body made before you made contact with the ball. You feel skilled and happy you can do this activity so well. You continue to kick the ball around your backyard and try different strategies. Now, I want you to picture yourself standing with the ball in between your feet and your eyes looking ahead at an imaginary target, like the empty space in between two big trees. Feel yourself dribbling the ball quickly with your feet, in a straight line towards the imaginary target. Now, picture the bottom of your shoe gripping firmly into the grass as you extend your other leg backward. You make contact with the ball and you watch the ball soar through the air and smash into the imaginary target. Feel the sense of accomplishment, the feeling of happiness and confidence, and the feeling that you can do this with ease.

Now, imagine you choose to do a different active play activity, like throwing a ball. Focus on your upper body...it's upright and your shoulders are relaxed. Feel the firm grip of your throwing hand wrapped around the ball. Be aware of how confident you are with your body positions. I want you to imagine the same imaginary target you had when you were kicking the ball. Your body is perfectly lined up with target. Picture your throwing arm bending back towards your shoulder and then straightening out in front of your body as the ball leaves your hand. Watch the ball strike the imaginary target. You are happy with how well you threw the ball: smoothly, effortlessly, straight, and consistent. You know in your mind that you can do this throw, now and other times you do this active play activity. Imagine yourself feeling more and more confident as you continue to throw the ball around. Picture yourself having lots of fun because you feel you are good at doing active play.

Now, I want you to imagine what your body feels like while you are kicking or throwing a ball. Imagine yourself feeling re-energized because the smell of fresh air and the warm sun on your

skin. Pretend the air is filled with lots of energy. As you continue to move your body, you increase the amount of air you breathe in. This gives you lots and lots of energy...you feel like you could keep going and going without stopping. Feel the sense of happiness and joy while you move your arms and your legs during active play.

Now, I want you to picture yourself when you have finished doing all the active play activities you wanted to do...like kicking or throwing a ball. Think about how good you were today when you were playing outside in your backyard. You feel satisfied and happy with your ability to do active play so well. Imagine yourself feeling excited about the next time you will do active play.

APPENDIX I

Control Group Stories

Study 2

The case of the daily telegraph – Chapters 1-6

Chapter 1

I was a P.I., and my job was doing what my clients wanted, no questions asked. I was just starting to stand up when someone jumped behind the bushes I'd been using as cover.

"What's the deal?" I asked

"Stay down" he said, grabbing my shoulder and shoving me lose to the ground He was a big guy, but no taller than six foot fix, and no more than three hundred pounds. His hand was about the size of my head, and it felt like me might break my shoulder if he didn't let it go soon.

"Easy there boss" I groaned. "I'm not going anywhere"

"Huh?" he said, not looking at me. He was peering over the bush, but I couldn't see what he was looking at

"Could you please ease up on my shoulder, brother?" I won't blow your cover. I promise. He was wearing a black jacket with the hood up and a ball cap pulled low underneath, so I couldn't get a good look at his face. "Oh, sorry, he said.

"I'll hold tight, but can you tell me what we're supposed to be looking at?"

"Across the field, the can"

"The garbage can? I asked, following his gaze to the far side of the football field.

"I just made the drop, they'll be here soon" he said

The two of us squatted there, watching the garbage can, but no one came to pick anything up. The first bell rang, and my oversized friend glanced at his watch.

"They've got to come they've got to come, he whispered. We both sat and watched the can in silence The back lot was completely empty.

"What's in the can?" I asked He didn't answer

"What's in the can?" I repeated

"Shhh...be quiet!" he whispered

"I'll be quiet when you let me know what's in the garbage can"

"Would you be quiet! He hissed. "Who are you anyways?" he asked.

“Easy guy, you’re the one who invited me to stay for this party, remember? I’m just wondering what the surprise is going to be.”

He glared at me for a second, then glanced at his watch again. “Why aren’t they coming to get it?”

I was beginning to thin this guy was loony tunes, and I didn’t like the idea of spending my morning hiding in the bushes with a goofy galoot. “Look pal, I don’t know what game you’re playing, but if you don’t bring me into the loop, then I’m getting up and going inside.”

“It’s an essay all right? Now be quiet”

“Why did you put an essay in the garbage can?

“I put it in the can because someone’s got Carver That’s why. Because they have Carver” he said, punching the ground with one giant fist.

“Who’s Carver?”

“Here” he said, pulling a folded piece of paper out and tossing it to me. It was a picture of a hamster, standing in front of a newspaper. There was a message scrawled in red letters across the bottom: “Write the essay or the rodent dies”

“Carver’s a hamster” I said

“Yeah, he’s a hamster, he’s my hamster.”

“So whoever has Carver made you write this essay for them, or Carver gets to meet his maker?”

“That’s right” he said, turning to me. “Say you put that together pretty quick, are you in on this?”

He looked suspicious, and I didn’t like the idea of a guy that big getting suspicious. “I don’t know a thing about Carver the hamster. I do know a little something about blackmail. I know too much about it. See, I solve problems, and blackmail seems to be a problem that’s going around Iona High in spades.

“You solve problems? What are you, like a detective or something?”

“Detective, private eye, gumshoe, last resort – you can call me whatever you like”

“Well, he said, I wish you could solve this problem”

“That can be arranged” I said

“How’s that”?

“Like I said, I solve problems for people. I could solve this one for you. But before you put me on the case, you should know there’s a price. There’s always a price.”

“Oh yeah, what’s that?” he asked

“If I solve this problem for you, then sometime down the line, I’ll pay you a visit, and I’ll need a favour”

“Man, if you can find Carver, you can ask me for whatever you want”

“Then it looks like I’m on the case” I said, holding out my hand. “Name’s Jack Lime.

“Tyrone Johnson” he said, shaking my hand. I was afraid he might break it. The late bell rang, and he checked his watch again. “I’m going to be late for pre-call”

“That’s why you hire a peeper like me, Tyrone. So you can drift off to class and I’ll make sure nobody walks away with your essay”

“All right” he said, getting up and heading for the door. He stopped halfway turned around a came back.

Monday, June 2, 2:02 pm, Iona High, the back lot

I’d just spent an entire day staking out a garbage can instead of going to classes. Good thing Tyrone was bringing me my fourth bottle of water that day. I thought the jacket he’d been wearing when I first met him might have bulked him up, but he wasn’t wearing his jacket this time and he was just as big as I remembered.

“Bad news,” I said, as he squatted down beside me. No one has even glanced at that can all day. Not even a whiff of interest.

“I can’t figure it out, he said, why would someone make me write an essay and then not come to pick it up?”

“Maybe they’re patient” I said

“What do you mean?”

“They might be back after school, or maybe even tonight But I have to let you know, Tyrone, I can’t stick around here forever. I’ll stay until 5, and then I have to head home. When my grandmother finds out I cut classes today, I’ll fry, but if I’m late for supper she’ll have the fuzz scouring the town for me again. Meet me in the cafeteria tomorrow morning at eight”

Chapter 2

[Recap: Jack Lime met Tyrone and has decided to help him find out who has taken Carver, his hamster]

June 3rd 8:09am, Iona High Cafeteria

I was sitting at the back of the cafeteria eating a bacon and egg sandwich and sipping a frosty root beer that I had picked up on the way to school when Tyrone blew in through the main doors

"Did they pick it up" he asked

"Nope, and I stuck around until 5, but the place was a ghost town.

"I don't understand, I just don't understand it"

"Tyrone, if I'm going to help you, I'm going to need some information. Why don't you tell me how this crazy dance got started. From the beginning this time"

"Well a little over two months ago, I brought Carver to school for a biology experiment. After I finished my presentation, the lunch bell rang. I left Carver in his cage in the lab for lunch, and when I got back, he was gone. A couple of days later, there was an envelope taped to my locker. Inside was a picture of Carver. There was a message on the back that said to do the French take home test that was in the envelope or I'd never see Carver again. They told me to put the test in a black garbage bag and drop it in the trash can on the far side of the football field first ting Monday morning.

"The drop's always on Monday mornings"

Tyrone nodded

"How many projects have you done?"

"About one a week. I just don't know why they wouldn't pick the stuff up. The extra work is starting to kill me, and then they don't pick the stuff up. It's crazy.

"They might have come in the middle of the night, for all we know. We'll check the can once I finish eating, but there's got to be a better way of catching this guy than sitting outside and melting in this heat. I'll need a description of every project you've had to do. Maybe I can narrow down which classes this fakeloo artist takes based on the assignments you've had to do" I said

"I can tell you one thing, Tyrone said, Whoever it is, they're not in any of my classes"

"How's that?" I asked

"Besides the English essays and the French test, they've given me some economics and an ancient history project"

“What do you take?” I asked

“Physics, pre-cal, advanced chemistry and advanced biology. There’s a small group of people who take those classes, and we pretty much follow each other around all day. Plus the first thing I did was ask around the class. Nobody takes any of those courses this semester.

“That could be important. Write up that list for me, and I’ll start pounding the pavement, knocking on doors and asking the kind of tough questions people don’t like to answer.

“No problem” Tyrone said, now let’s go check that can.

Tuesday June 3rd, 8:33am Iona High, Mr. Kurtz class

The essay was still in the garbage, right where he’d left it. I told him I couldn’t afford missing school two days in a row, so I took his list of project and headed to my morning class. I had English first, and the essay in the can was on *The Old Man and the sea,* so I decided to hit up Mr. Kurtz with a few razor-sharp questions

“It’s not one of mine” Kurtz said. “And I can tell you this, Mr. Lime, it doesn’t belong to any other teacher at Iona High.

“what do you mean?” I asked

“That essay hasn’t been assigned in two years. So if your friend is planning on selling it or something, he may as well forget it. It’s worthless. That essay was one of Brian Murdock’s assignments. Brian retired two years ago.

“So there’s not a single solitary teacher in this building who would assign this essay?”

“That’s right” Mr. Kurtz said

That’s when I had an idea “Got to go” I said and bolted out of the room

“Get back here Mr. Lime!” yelled Mr. Kurtz, I’ll mark you absent”

The late bell rang just as I stepped out of the school. I raced across the field and tossed the lid off the can. It was empty, completely empty. Even the few cups and soggy cigarette butt that had been sitting at the bottom were gone. Someone had collected the garbage. I raced to the far side of the building where the big green dumpsters sat. Tony Leoni, the school’s custodian was tossing the bags into the dumpsters.

“Stop! I hollered, as I bolted across the field. “Stop”

“What? What? What do you want kid?”

“I need to look through those bags!”

“Are you crazy?”

“I dropped something in one of them, and I need to get it back. It’s valuable. I need to look through the bags. Please”

“What’s with you kids? Last week some mooyu chucked his wallet in the garbage. He ripped the bag apart and I had to clean up the mess. So you listen close kid, you want to dig through the trash, be y guest, but I’m warning you, if I see one bit of garbage floating around out here when you’re done, I’m going to come after you.

“It’ll be spic and span” I promised.

“Do you always collect the garbage on Tuesdays?” said to his back

He whirled around and learned into me again, breathing stale coffee into my face. “You know darn well I collect on Mondays, don’t you kid? He hissed, poking me in the chest with a thick pudgy finger. “Are you some kind of snitch or something? Did the principal put you up to this? Does Snit want a piece of me? well you can tell Snit that I had an appointment yesterday. I don’t need a snotty kid telling me I’m a day late! I know I’m late1

“Just wondering...Just wondering is all!”

Folks, there are parts of this PI game that are nastier than cleaing the boys’ bathroom with a broken toothbrush. Digging round in those dumpsters was one of them. But I found the essay.

Chapter 3

[Recap: Jack has discovered that the essay Tyrone has been writing has not been assigned by any teacher for the past 2 years. He also found the essay in the garbage bin…no one ever came to collect it]

Tuesday June 3 9:32 am – A street with no name, Grandma’s House

Snit, the principal, decided I couldn’t go back to class stinking like week-old fish burgers, so he wrapped me in some old blanket and drove me home. Apparently, Snit, had issues with me skipping classes to work on my investigations. My grandma seems to have issues with that too. So we all sat down and have a very pleasant chat over tea and crumpets to address the matter. I made nice with Principal Snit, and they decided that suspension was out of order, but I had to promise to keep my nose clean. Snit said his good-byes and I hopped in the shower.

Tuesday June 3rd 12:31pm – Iona High, The cafeteria

Tyrone was about as hard to find in the cafeteria as a wolf at a sheep convention. Except in this case, he was the sheep, and somewhere in the crowd there was a wolf who was ready to bite the head off little old Carver if I didn’t watch my step. Tyrone was sitting at the back with two

empty trays of food in front of him and a physics textbook jammed under his nose. I tossed the essay onto the table. He grimaced at the stink before he realized what it was. “What are you doing?” he cried. “If that’s not in the can, Carver’s a goner!”

“Relax” I said. “I haven’t figured it all out yet, but I think we’re dealing with a fakeloo artist who’s just blowing a lot of hot air.”

“What are you talking about?” he asked.

“I talked to my English teacher today. We don’ even have a copy of *The Old Man and the Sea* at Iona High. The teacher who used to torture his students with this particular essay retired two years ago. Plus, Leoni collects the garbage on Mondays. I don’t think your hamster napper ever intended on making off with this easy or any of your work. It just all got collected with the trash”.

“I don’t understand” he said. “Why would someone want me to write an essay that was never assigned and that they’d never pick up?”

“That’s why I’m here. I need to pick your brain. Who would get a kick out of you doing a whole bunch of projects? Why would someone do that to you?”

“Well,” Tyrone started, “it’s kept me pretty busy. I mean, it’s kept me up late, and I don’t have much time for my own homework. It’s made my grades slip a little.

“That’s a start” I said. “What kind of grades do you get?

“Perfect grades”

“What do you mean perfect grades?”

“Perfect. One hundred percent”

“You always get 100%. On everything?”

“I used to, until Carver disappeared. The extra work has hurt me. I think I’ve got a 98% average now. I need those grades so I can win the Luxemcorp Prize. If I don’t win that, I’m not going to university.

“How much is it worth?”

“Thirty five grand each year you’re in university” he said, and then slammed his hand down on the table. “That’s it, they’re after the scholarship. They want me to lose”

“Tyrone, I said, why don’t we walk and talk. If the person who has Carver knows we’re on to him, Carver’s life might be in danger”

“I can’t believe I didn’t figure this out earlier. It’s got to be someone going after the scholarship”

“There can’t be too many people on that list,” I said “do you have anyone in mind?”

“I don’t know...not really. I mean, I thought they were my friends”

“There’s got to be someone who’s close to your grades who might want to take you out of the running.” Who’s your main competition?”

“Well, there are only two people who are really close to me” he said. “Walter Hampton and Polly Chew”

“Then we just have to track them down and figure out if one of them has Carver. It’s a start” “Do you have that picture of Carver they sent you?”

He pulled it out of his pocket and handed it to me. I scanned the photo, looking for some kind of clue. Then it hit me. It was right in front of us, in black and white.

“Look at the paper,” I said.

“What?” he asked. “What I am looking for?”

“The bum who is pulling this con job takes these snap shots of Carver so you know he’s alive the day he took the picture. The date’s right there, at the top of the page. But there’s something else at the top of the page” I said

“The Daily Telegraph” he said

“That’s right. We just need to stake out Hampton and Chew and find out which one gets The Daily Telegraph”

“You’re brilliant” Tyrone said.

Chapter 4

[Recap: Jack has figured out that whoever stole Carver did it so Tyrone’s grades would drop, meaning it’s probably someone who doesn’t want him to get the scholarship].

Wednesday June 4th 7:02 am – 34 Kuper Belt Crescent, The Hampton Place

There I was squatting behind the neighbour’s fence, waiting for the Hamptons to get their paper. This line of work isn’t all glitz and glamour, that’s for sure. 99% of the time it’s dreary and dirty and dull. It’s about rooting around in dumpsters and eating a stale granola bar you found in your

pocket for breakfast instead of your grandma's buttermilk pancakes because you're waiting for the morning paper to show up, and the kicker is, you're not going to get to read it. But when the action happens, all the waiting pays off – big time. The newsie had just turned the corner on his bike, tossing the paper onto lawns as he went, and he was heading my way. I hunkered down and waited for him to pass by, and then I scurried across the street to see what the Hamptons liked to read with their morning coffee. Bingo! It was The Daily Telegraph. I was just about to drop the paper back onto their step, when the front door flew open and two people rushed out

"Thanks kid" said the first one, grabbing the paper out of my hand.

Now to check in to find out what paper is at Polly Chew's house. Unfortunately, it was The Daily Telegraph as well. This job was turning into a real brain twister and I was getting nowhere fast.

Wednesday June 4th – 8:17am Iona High, The science hallway

Things were getting desperate for yours truly. I hate to admit it, but on my way back to school, I started to wonder if Carver was worth it. Thirty five thousand could buy a lot of hamsters, even after all the other expenses of getting high-class education. I found Tyrone standing alone in the science hallway, staring at pictures of the illustrious winners of Iona High's Science Fair, past and present.

"Did you find out who it is? Is it Polly?" he said.

I shook my head. "We struck out. They both get The Daily Telegraph.

I didn't know what I was going to do now. Chew and Hampton were just two possible suspects. It could have been anyone who was interested in winning the Luxemcorp Prize. Or it could have been anyone who didn't want Tyrone to win the prize. I was getting nowhere fast.

"I guess I can see why they'd be mad at me" he said.

I followed his gaze. All the people in the pictures were smiling back at us without a care in the world. There was Amelia Freeman dressed in a white lab coat and holding a beaker full of blue stuff. Next to her was Glenn Patterson standing beside a bubbling barrel of red goo. Then there was David Philips holding blowtorch and laughing, and next to him was Ralph Hampton squirting some kind of liquid out a syringe. Wait a minute! There was Ralph Hampton squirting some kind of liquid out of a syringe. Ralph Hampton; the same Ralph Hampton I watched fall on his face that morning. There was no doubt about that sharp honker of his. You could slice tomatoes on that thing. Under his picture there was a small gold engraving that read: *First Prize – Grade 12 Science Fair – Awarded to Ralph Hampton*. So Ralphy graduated from Iona High two years ago. Fireworks went off in my head. Connections were being made. Things were starting to make sense.

“I have to go” I said, yanking the picture off the wall.

Wednesday June 4th 8;26am – Iona High, The Guidance Office

Ms.Mickle knew everyone who had passed through Iona High’s front doors since it had opened 12 years.

“Ms. Mickle” I said, holding up the picture, “do you know this guy?”

“Well if it isn’t Jack Lime. Come in, come in” she said. You haven’t been in recently”.

“Please Ms. Mickle, do you know Ralph Hampton?” I asked.

“Ralph Hampton?” she said. “Now that name sounds familiar”

She leaned back and closed her eyes for a long time. For a second, I thought she’d fallen asleep and then she blurted out, “Oh, sure Ralph Hampton. He was smart as whip, but the clumsiest kid I ever met. Do you know he set himself on fire in his economics class? He didn’t even have any matches. He was our top student until Cindy Hooper came here”

“Cindy Hooper?” I asked

“Cindy came here her senior year. Her parents moved from Boston. I think her father was a professor...or a scientist...or maybe an engineer. No, I think he was a lawyer. Oh, I guess it doesn’t matter now, does it? Anyways, Cindy was only 15, but she was the brightest young lady we’ve ever had at our school. She was a genius. A real genius. Poor Ralph, probably would have won the Luxemcorp Prize if she hadn’t arrived on our door step. Poor Ralph.

“Thanks Ms. Mickle” I said, getting up.

Chapter 5

Here’s what I knew so far:

- Ralph Hampton had taken some economics
- Tyrone had been given an economics project to finish
- Ralph had graduated two years ago, which meant he could have had Murdock for his English teacher, and he probably would have done the essay *The Old Man and the Sea*
- Tyrone was given the exact same essay to finish two years after the novel had been taken out of school
- Ralph had lost the most prestigious scholarship to a girl who arrived on the scene at the last minute
- Tyrone has arrived at Iona High at the last minute, and now he was about the steal the Luxemcorp Prize out from under Walter Hampton’s sharp nose

Tyrone was moving in on sacred territory and the blond model of the Hampton family wasn't going to let anything stand in his way of winning the Luxemcorp Prize. He'd gotten his slimy fingers on some o fhis brother's old work and now he was making Tyrone do useless projects to keep him so busy that he'd lose the scholarship. Well, I was tired of squatting in bushes holding early morning skateouts and rooting around in dumpsters. It was time to take the bull by the horns, to stand and deliver, to draw a line in the sand. I was going to pay Walter Hampton a visit and I was going to get Carver back. Things might get rough, they might even get a little messy but I was okay with rough and messy as long as I could shut the lid on this dirty case.

Wednesday June 4th – 3:43pm – 34 Kuper Belts Crescent – The Hampton Place

I avoided Tyrone like the plague for the rest of the day. I was tired of talk. The next time I saw him, I wanted to have Carver in hand. I was out of school before the bell finished ringing and made a dash for the Hampton place. I was sitting on his steps when Walter stepped onto is front walk.

"Hello Walter" I said getting up. "I think we both know why I am here"

"Who are you?" he asked, stopping in his tracks.

"You want to play it that way?" I said. "That's fine. Let's play coy. My name is Jack Lime. You probably know my client, Tyrone Jonson.

"Sure i know Tyrone" he said, playing the innocent rube.

"Still playing dumb? Well I'm tired of that game, Walter. I'm really tired of it. So why don't we cut the chase". I marched over to him. We were face to face. You've got something that Tyrone wants back, and I'm here to collect it".

"I don't know what you are talking about".

"Something small and furry" I said.

"Get out of my way" he said, and tried to push past me. I grabbed him and spun him around to face me again.

"No dice" I said. You're not going anywhere until you fess up to the kidnapping and the blackmail scam you've been playing at. It's a filthy graft, Hampton, and as sure as ten dimes an make a dollar you're the one pulling the strings".

That's when Walter did some fancy judo moves that sent me back, then up, and then down to the ground. Before I knew what had hit me, he had his knee pressed into my back. "Now you listen to me clown" he said. "Yeah, I've got the rodent. He's upstairs, in my room, probably asleep in an old toilet paper tube. It doesn't matter if you know or if Tyrone knows. Actually this will make things much easier. You can be my messenger boy. Go tell Tyrone if he wants to see

Carver alive, he'd better get me some research on the wind turbine project we've got for physics class. Tell him I want it by Friday, and it'd better be good".

"Why would he do that?" I gasped trying to get myself out of Walter's wrestling hold.

"Because if he doesn't I'm going to feed Carver to my pet python, Cindy. How's that sound?"

"How does he know you'll give him Carver back?"

"He'll get Carver back the day I leave for university next fall. And he'd better make sure that I'm going with a thirty-five thousand dollar check in my pocket. You got that?"

I could feel him ease up on my back, so I shifted my weight quickly to my right. He slipped off and I was about to pounce on him like a cat on a mouse. Unfortunately, that's why my condition kicked in, and I passed out.

Wednesday, June 4th 4:47pm – 41 Main Street, Sam's butcher

There is no Sam at Sam's butcher. There never was a Sam. The placed is owned and operated by Luxemcorp Inc, the same company that owns all the stores in Iona. Luxemcorp just slaps hockey names on each sotre so people think they're quaint, family owned businesses. It was suppose to make everyone feel warm and fuzzy. Tyrone was sitting in the corner of the place reading a chemistry book. When I walked in, he jumped up.

"Jack! Am I glad to see you. I worked out our problem"

"I've got some news too," I said.

"Whoever's getting me to do this, thinks that I don't know about the whole garbage collection thing They think that I think they're actually handing the stuff in. But I know they don't even look at it. So all I have to do is put some paper in the black garbage bag and make the drop every Monday, and they'll never know the difference. That way I can focus on my work and still win the Luxemcorp Prize.

"Great" I said, "but..."

"No no wait, it gets better. Whoever has Carver can't kill him, or I'll stop doing the extra work. They want carver to stay alive. As long as he's alive, I'll have to do the assignments for them. It's called leverage. So carver will be safe until we figure out a way to save him. I worked it all out in physics class. It hit me like a meteor dropping on my head. It's all so obvious that I can't believe I didn't think about it sooner"

Chapter 6

[Recap: Jack found out that Walter Hampton has stolen the hamster and doesn't plan on returning him to Tyrone any time soon].

“Yeah, i wish you had figured it out soon”

“What do you mean,” he said.

“I found out Walter was our man, so I decided to pay him a visit after school”

“And?”

“He’s got Carver”

I watched Tyrone’s beefy first clench shut.

“And he doesn’t care if you know it. Like you said, he’s got leverage”

“What’s he going to do?”

“Nothing” I said, He’s going to keep Carver alive and he’s going to keep you working overtime. Only now you’ll be doing real work instead of stuff that winds up in the trash”

“So” he said, you’ve made things worse?”

“I’ve made things a whole lot worse Tyrone” I said. And I’ve got a message for you. Walter wants you to do some research on some wind turbine project you have for physics. And he wants it by Friday.

“Well” Tyrone said, at least I’ve got most of that done already”.

“You’re a keener” I said, through and through”

“Not really” he said, “I did something just like this for my Science Fair project last year. I just have to find the copy of the video”

“You’ve got a video of your Science Fair project?”

“Of course” he said, “I record all of my projects, remember?”

An idea hit me like a runaway locomotive. “Tyrone, I know I’ve botched things pretty bad, but I think I know a way to make everything right again”.

“I don’t know Jack” he said, shaking his massive head “I think it’s time to go our separate ways”.

“Just hear me out. I need you to go home and write a paper on wind turbines that so good Walter Hampton will think three times before he decides not to use it. Just make sure you use the exact same words you used in the original video; use the same terms, the same phrases. Make sure anyone who reads that paper will know that it’s based on your first project. You see where I’m going with this?”

He brightened a little “it might work, he said, it’s worth a try”

Monday June 9th 3:43 pm – 34 Kuper Belt Crescent The Hampton Place

It was the last Monday of classes before exams started. All the wind turbine projects had been handed in. Grade 12 physic students all over Iona High were celebrating. I was sitting on the front steps of the Hampton residence waiting for Walter to get back home.

“Hello Walter,” I said. “Good to see you again”

“What do you want Lime? Another beating?”

“How did the wind turbine project go?”

“Fine,” he said. “Just fine”

“All handed in and wrapped with a bow?” I asked.

“That’s right,” he said. Now could you get out of my way? I have a hamster to feed. And a pyton too”.

“You don’t have to worry about Carver anymore” I said.

“What are you blabbering about now” he asked.

I pulled a DVD out of my pocket. “You know what’s on this? A video of the winning Science Fair project from City Heights High School. It’s all about wind turbines Tyrone Jonson did it last year. It’s fantastic. You should watch it, Walter”

Walter pursed his lips and his nose got a little sharper. He snatched the DVD out of my hand.

“You’re welcome Walter. Consider it a graduation present. Of course there are plenty of copies: one for your physics teacher, one for Principle Snit, one for the execs at Luxemcorp. They might get a special delivery this week. But that depends on whether or not you give up Carver”

“There’s nothing on this” Walter spat at me.

“there’s lots of good material on there Walter. You can watch it to your heart’s content tonight. And you’d better hope your paper isn’t too much like Tyrone’s Science Fair Project. Think back Walter, how much did you use out of that paper Tyrone sent you? A little? A lot? Academic fraud would take you out of the running for the Luxemcorp Prize”

“I’m going to kill that little ball of fur right now” he barked, stepping by me. “I’ll feed it to Cindy”

“that’s a lose-lose situation Walter” I said before he got inside. You’d be out of the running for the big prize and Tyrone loses his precious hamster. But Tyrone will get over it, I’m sure. Thirty

five grand a year will do that to a person. Plus, he'll finally get the chance to stuff you in a toilet paper roll without worrying about Carver getting fed to the snake. I don't think you'd look good stuffed in a toilet paper roll walter. How about you? No, I think the smarter play would be you bringing Carver down here now and taking your chances on the prize the right way, the fair way, using your brain instead of Tyrone's".

"How do I know you won't send the disk anyways" he asked?

"Its called leverage Walter. We send the DVD and we lose our leverage"

Monday June 9th 5:28pm – 2 Main Street, The Train Station

The train station is a busy pace at rush house. Parents are getting home from a hard day's work. Kids are crowding onto the trains to go earn a dime at part-time jobs in the city. But Tyrone Jonson is not a hard person to find, even in a crowd.

"Thanks again Jack" he said, putting Carver into his cage and draping a blanket over it.

"I'm just glad you've got him back"

"how did Walter take it?"

"Not good" I said. "I'd keep an eye on him for the rest of the year"

"I'm not worried" Tyrone said, "as long as we've got some leverage".

The Case of the Broken Lock – Chapters 1-6

Chapter 1

It was a hot and sunny day. The first hot and sunny day we'd had in Iona in nearly two weeks. The kind of hot and sunny that makes your shirt sticks to your back. All the other kids in Iona were outside, soaking up the heat like a bunch of lizards but not me. I was inside, tucked into the rear booth of The Diner, where not even the rays of the sun could touch me, nursing a root beer float and trying to ignore my throbbing left eye as it swelled shut. The place was empty except for the owner, Moses, who was in the back clinking dishes together. That's when Sandra Kutcher walked into my life. Sandra was a tall 12th grader, with long blond hair pulled back in a ponytail.

"I'm looking for Jack Lime", she said, before the door had a chance to close behind her. My eyes started to throb a little harder. Members of the social elite at Iona High had been hunting me down all day. When they found me, it always meant trouble. I figured Sandra was just another angry grad looking for a chance to pay me back for breaking up Iona High's Prom King and Queen a month before the big night. Just one more kid from the inner circle who wanted to pay me back for showing the world the truth. Well sorry folk, but showing the world the truth is my job.

"I'm Jack" I muttered.

"Oh, thank God I found you!" she said.

I was waiting for a slap in the face, so "Oh thank God I found you! Was not the reaction I was expecting.

I thought we were alone until she started toward my booth, revealing a grim, ghostly boy standing in her shadow. He was short and doughy with a bowl cut of jet-black hair. "Well come on Ronny" she said. "You're the reason we're here, after all."

She waited for Ronny to join us, then leaned across the table and whispered, "They told me you find things out."

"Finding things out is how I got this" I said, pointing at my shiner.

"Ronny's bike was stolen last night, and it's his birthday tomorrow and he loves that bike because he had it, like forever, so he really wants it back for his birthday, and if you could find it that would be just supper".

"Sounds like an interesting case," I said. I was lying, but I was willing and able to do anything for this girl, including making ridiculous promises. "I'll tell you what. I'll find that bike and I'll get it to you by tomorrow, or I'll personally buy Ronny a new bike".

“Great!” she exclaimed, and started pushing Ronny out of the booth. They were halfway to the door when she turned back and added, “Oh and by the way, Jack, can you get it to us by two? That’s when Ronny’s party starts. Thanks!” Then she was gone.

Was it possible to track down a missing bike in less than 24 hours in a town like Iona? Probably not, but I wasn’t going to tell Sandra that. So I figured I’d better get cracking on the case.

I pushed the float away, slid out of the booth and headed for the door. I was just stepping outside when I realized I didn’t know thing one of about this case. I didn’t know what the bike looked like. I hadn’t even asked a single solitary question. That’s what Sandra did to me; she turned me into a slobbering amateur without a sweet clue how to investigate a case. I took a long deep breath, gathered my wits and marched back into The Diner. There was a pay phone on the back wall. I grabbed the phone book and flipped to K. Lucky for me there was only one Kutcher in town.

Friday May 23rd 3:56 pm – 14 Mercury Lane- The Kutcher Place

I strolled down the walk and knocked on the front door. I have to admit, I didn’t mind asking Sandra if she’d step outside to answer a few questions.

We all gathered in the driveway. Ronny stood off to the side, tracing imaginary lines on the ground with his shiny black dress shoes. Sandra stood beside me.

“Ronny always locked his bike to the fence”, she said.

“Where exactly was it locked?” I asked.

She led me to the spot, and I took a close look at the fence. There was no damage to the wood or even to the paint.

“What kind of lock was it?” I asked

“It was just a regular lock”

“One of those U-shaped locks? I asked

“Look” Sandra said, “we don’t care about the lock. Ronny wants his bike back, not the lock, the bike! It’s red, with like, a yellow banana seat, white streamers and a silver bell on the handlebars. We don’t care about the lock. We can get a new one of those”.

“Could I at least see the lock?” I asked.

“Why would we have the lock? They robbed us. Remember? Are you even taking this seriously Jack?”

Before I had a chance to answer, Ronny spoke up. “It was a U-shaped lock, with a blue plastic covering”.

“Were you the only one with a key?” I asked.

Ronny nodded

“Do you know anyone who would want to steal it?

“If we knew who wanted to steal the bike, we’d, like go find them ourselves” Sandra said.

“Maybe the Riverside Boys took it” Ronny said, ignoring Sandra

“Ronny” said Sandra, walking over to him and putting her hand on his shoulder “those boys are too big to be interested in your bike. They couldn’t even ride it”

“But they could sell it” Ronny said, obviously getting excited about being involved in a real investigation.

“At a Flea Market” I added with a smirk.

FYI – The Riverside Boys are a bunch of high school thugs who get their kicks stealing stuff from honest kids like you and me. Then they unload the merchandise down by the Iona River on Friday nights. They call their little business venture the Flea Market. Real classy.

“Sounds like a good lead” I said. But I had serious doubts that anyone, let alone the Riverside Boys would get much on the black market for a bike with a yellow banana seat and streamers.

“No one would steal Ronny’s bike to sell lit” Sandra whispered, leaning close to me. “He got it for his seventh birthday, but he hasn’t grown for like, five years, so he can still ride it. He loves that bike so much that Mum and Dad can’t bear to get him another one. But nobody else would want it. It’s just someone out for a cruel joke”.

“Don’t worry Sandra” I whispered. “I’ll find the bike, and I’ll get it to you by 2”.

She smiled and squeezed my arm, sending the most pleasant electrical tingle through my whole body. “Let me know if you need anything else” she said. “Come on Ronny, we have to set the table for supper”

Chapter 2

[RECAP: Jack Lime has just been introduced to Sandra and Ronny and they’ve hired him to look for Ronny’s stolen bike.]

I wandered down the street and sat on the curb. I had less than 24 hours to find a bike that nobody in their right mind would want to steal. If I was going to crack the case I had to stick to the facts:

- Ronny's bike was stolen last night
- It was attached to the fence with a U-shaped lock
- The lock and the bike are gone
- Ronny loves his funny bike

I walked back up the driveway and squatted by the fence where the bike had been locked. In my experience, and I've dealt with a few stolen bikes in my time, most bicycle thieves worth their salt would use liquid nitrogen to smash Ronny's lock to bits. It's easy, quick and quiet. The thing is, there's always chunks of metal and plastic left behind on the ground. Granted it rained last night, but I'd still bet dollars to doughnuts there's be a few pieces scattered here and there. But there was nothing, nada, niet. More importantly, if the perps smashed part of the lock or even if they used heavy duty cutters why would they take a broken lock with them? It was a small detail, but it bothered me.

All this speculation was adding up to bupkes, and I'm not a big fan of bupkes. The problem was I had nothing to work with except Ronny's crazy hunch that the Riverside Boys had swiped his bike to sell on the black market. It was probably a dead end, but it was something to go on, and I knew exactly who to talk to.

Friday May 23rd 4:27pm – 2 Ganymede Court – Iona Elementary

Missy King is Bucky King's little sister. Bucky is the Grand Poo-bah of the Riversied Boys. He's as big as an ox and twice as strong. He's the only kid in Iona who drives to school on a Harley, the only student who's taller than all of the teachers at Iona High. I couldn't just wander over to Bucky and ask him about stealing Ronny's dinky little bike without risking my life, but I could ask Missy. She owed me one

Missy owes me a favor. I helped her out of a tight jam about a month ago.

"Hi Missy" I said, approaching the playground.

"Lime" she said, flipping off the bars and stamping toward me.

"I'm calling in my favor" I said, stopping her in her tracks. She didn't answer. She just looked me up and down and smacked her gum a little harder.

"I'm looking for a bike" I said.

"I didn't have nothing to do with it" she said.

"So you know something about the bike that's been swiped?"

“I didn’t have nothing to do with it. Bucky took it. I tried to take it back”

“Don’t make it hard on yourself” I said. “Just tell me where the bike’s at”

“You calling me a liar” she asked.

“I don’t have time for your cat-and-mouse games, Missy. Tell me where I can find that bike”.

“I tried to bring it back but the kid had a new one”.

I ignored this. Missy is like the devil; she’ll mix her lies with the truth. “Where’s the bike?” I demanded again.

Without warning, she sprang across the few feet that separate use and kicked me, kung-fu style, in the stomach. I crumpled to my knees, winded. I heaved myself up, staggered across the playground and caught a glimpse of Missy’s pigtails bobbing up and down on the other side of a fence as she raced across someone’s back yard. Just as I was pulling myself onto the fence, I passed out. I woke up gasping for air, but all I got was a mouthful of fur –cat fur, to be exact. A fat orange and white cat had decided to take a nap on my face while I was passed out. Ten minutes had passed. Missy was long gone. I plucked cat hair out of my mouth and decided to head back to the Kutchers.

Friday May 23rd 5:35pm – 14 Mercury Lane The Kutcher Place

Standing on the Kutcher front stoop, I replayed what Missy had said. A bike had been snatched; there was no doubt about that. I didn’t know where she was going with the whole “I tried to bring it back, but the kid has a new one” spiel, but I had a hunch it was a smoke screen to keep her out of trouble. One thing I was pretty sure about – if the Riverside Boys had a hot bike, they’d be bringing it to the Flea Market tonight.

“Oh my gosh, Jack!” Sandra gasped, opening the door and breaking my train of thought. “What happened to your face?”

“Huh?” I said. I leaned to the side and caught a glimpse of my reflection in the window beside the door. I was covered in scratches. “Oh that. It’s nothing” I said. “You got a minute?”

“Well we’re just starting supper” Sandra said. “You can come in but it’ll have to be quick”.

“Is Ronny around?” I asked.

“Just a sec” she said, gliding up the stairs and disappearing into a side room. She returned with Ronny

“I’ve got some news about the bike”.

“You found it” Sandra chirped, rising up on her toes and clapping her hands.

“Not exactly” I said. “But I did find out that Bucky King and his merry band of hooligans are probably unloading the bike tonight at the Flea Market”

“What does that mean?” Sandra asked.

“It means that yours truly will be crashing the Riverside Boys’ party tonight and I’ll out if it’s Ronny’s bike”.

“Won’t that be dangerous?” Sandra asked.

“Yes it will” I said. “It’s going to be incredibly dangerous but you’re my client and I’m willing to take that chance”.

Sandra took my hand and looked deep into my eyes. “Be careful Jack”

“Yeah be careful! Ronny boomed from the stairs.

“Find his bike Jack” Sandra said, squeezing my hand and then she went up the stairs and gave her brother a hug. “Don’t worry Ronny, Jack will get your bike back”

I let myself out.

Friday May 23rd, 6:28pm – A street with no name – Grandma’s house

Chapter 3

[RECAP: Jack has just told Sandra and Ronny that he plans on going to the Flea Market to see if Ronny’s bike is the one Bucky King took]

I had a plan. I was going to stake out the Flea Market, go undercover and infiltrate the Riverside Boys. This would be cloak-and-dagger stud, and like any good snooper, I had a stash of top-secret paraphernalia that would get me into places that I wasn’t suppose to get into. So I headed home to get my disguise together, check in with Grandma and grab a bite to eat.

Grandma was sitting in her rocking chair, knitting something red and watching Jeopardy when I slunk in through the front door.

“Sorry I’m late” I said.

“Off solving some great mystery, I suppose?” she said.

“I don’t know if I’d call it great” I said. “Just trying to find some kid’s bike.

“Oh they’re all great mysteries, Jack. Even the small ones” she said

“Anyway” I said, I’ll just grab something quick for dinner. I’ve still got a few loose ends to tie up tonight”

“There’s meatloaf, potatoes, and carrots on a plate in the oven, and a lemon meringue pie in the fridge”.

“Thanks Grandma”

After I wolfed down some chow, I headed upstairs and got into character. I put on my disguise, which consisted of a blond wig, an old Cubs baseball cap and a black Nike hoodie. I managed to transform myself from the tall, dark and handsome Jack Lime you all know and love to my scruffy alter ego for the evening, Roger Daltry. I topped off my new look with a pair of glasses that I’d found up in the attic. They were a little retro and the prescription made things kind of blurry, but it wasn’t anything I couldn’t handle. Plus, I hoped they’d cover up my black eye a little just in case Missy had let her brother know what I looked like.

Friday May 23 8:57pm – Riverside Park, The Flea Market

Riverside Park is a green belt that runs alone the Iona River. I hunkered down behind some bushes with a good view of the trash-infested clearing the Riverside Boys used for their illicit business venture. The sun was just about to set but here in the trees it was already getting dark. Farther down the river, ordinary people joked about the ordinary things they did in their ordinary lives. Here at the fat end of the park, an assortment of Iona’s shadiest kids were setting up shop, ready to sell their wares to anyone with enough dough to grease their dirty little paws.

I took off my retro glasses and tucked them into my pocket so I could actually see the seedy activities that were just heating up as kids started to trickle into the clearing. They stumbled over rocks and slogged through the thick, black mud that lined the river just to find a cheap deal. These were kids who got good grades, kids who never got into trouble, all handing over their allowances to buy things that had probably been stolen out of their best friend’s locker. I didn’t spot a bike in the mix, but I couldn’t be sure there wasn’t one being kept out of sight for the big rollers. I had to get a closer look, but I couldn’t just march out of the trees like a guy busting in on his sister’s pj party. I had to be subtle about things.

I made my way back up to the main asphalt path that wound its way through the park and spotted the narrow trail that led to the market. I started down the path and went over the cover story I’d made for Roger. He was an out-of-town kid who’d heard the Flea Market was the place to be if you were looking for something cheap.

The path led me straight down to the clearing I’d been watching from the trees. I spotted three goons standing at the edge of the river and decided to see if they had the dope on this crooked operation.

“What’s up, what’s up, what’s up fellas?” I said, getting into character.

“What’s up” the tallest one said.

“You’re not from Iona, are you?” another one of them asked.

“No I’m from out of town, but word is this is the place to go if you want to sweet deal on some high end merchandise”

“So, what are you looking for?” asked one of them.

“A bike” I said. “Something cheap, if you know what I mean”.

“Yeah, I think I know what you mean” the one said. Then he turned and disappeared into the trees.

When he returned, he was wheeling a slick yellow and black mountain bike. It had heavy-duty wheels, shocks and a lot of gears. This is not Ronny’s bike. But at that particular moment it wasn’t the bike that I was concerned about. It was the beast emerging from the trees behind the bike that got my attention. This was Bucky King in the flesh.

“Is this what you’re looking for?” the one asked, stopping the bike in front of me. Bucky stood a few feet away.

“Ah, actually, I was looking for something smaller” I said, trying to play it cool, “maybe with a few streamers, a banana seat, and a little bell”. I had to be careful; I didn’t want to blow my cover.

“You’re serious?” the one tall guy asked.

“Yeah” Is said, “it’s for my little brother Tommy. He’s got a thing for streamers, banana seats and little bells”.

“You must think I’m stupid” Bucky cut in. “I don’t suppose your little brother’s last name is Lime? Tommy Lime? Is that his name?” he asked, stepping over to me and poking me hard in the chest with a massive finger. “Cause I’m 100% certain that you’re Jack Lime. My sister told me you might be crazy enough to come down here tonight”.

“You got me Bucky” I said, holding up my arms. “Do you have the bike?” I asked, ignoring the fact that I was in no position to be asking questions.

Bucky smiled, started to turn away, then spun around and slammed his fist into my gut like a runaway locomotive. The wind blew out of me like a deflating balloon.

“Do you...”I said, sucking in air, “have...the...bike?”

“What bike Lime?” Bucky said.

“Streamers...banana seat...little bell” I said, just starting to get my breath back.
“Ronny...Kutcher’s”

“Kutcher? Sandra Kutcher’s little brother?” he said. “Man, doesn’t that kid still ride around on a tricycle?” The crowd laughed again. “Let me tell you something, Lime. Nobody’s in the market for that kid’s bike. That’s small time. Real small time, and Bucky King ain’t small time.”

“Toss him in the river with the rest of the trash” he said.

I kicked. I thrashed. I fought the good fight, and I wish I could tell you I escaped, but that would be a lie. They started swinging me back and forth, building momentum. “One...two...three!” they hollered. For a moment, I was flying through the air, then I hit the water.

After hitting the water, I struggled out, soaking wet. After that adventure I decided to head home and rethink this whole case.

Friday May 23, 11:38pm – A Street with no name – Grandma’s House

Chapter 4

[RECAP: Jack has just gotten back from the Flea Market where he didn’t find Ronny’s bike and Bucky King and his goons threw him in the river]

My hat, my wig, and my glasses had fallen off in the river. I’d been beaten up three times today .And what did I have to show for it? Nothing. I didn’t even have a few coins to rub together. The way I figured, it was time to take down my shingle and take a permanent vacation from the P.I. business.

That’s what I was thinking as I staggered home, so I didn’t notice my grandma sitting on the porch as I stepped onto the front walk. I’d also forgotten about the 10 o’clock curfew and the fact that I was half covered in mud

“Burglar!” she yelled, grabbing the broom she used to sweep our porch. Unfortunately, Grandma didn’t recognize the ragged stranger stumbling up her front walk, so she charged at me, waving the broom above her head like a helicopter warming up. Like I said my grandma’s not a small lady. So I did the only thing I could think of; I ran. She would have woken up the whole neighbourhood if we’d had any neighbours to wake up. As it is, my grandma lives on a deserted dead-end dirt road without streetlight or even a name. She used to have neighbours until Luxemcorp bought up the town. My grandmas and Moses (he owns The Diner) were the only two people who didn’t sell out. Luxemcorp just built around them. So there I was, being chased down a deserted road in the middle of the night by my own grandmother. It was the perfect end to the perfect day.

“Grandma! It’s me!” I yelled, but she didn’t have her hearing aid in. We were halfway down the street when she clocked me in the head with the broom and knocked me to the ground. “It’s me! Jack!” I yelled, rolling onto my back. She had the broom raised above her head ready to drop the hammer on my noggin when she realized who I was.

“Jack,” she growled, “you’re late!”.The she turned and without another word, marched back to the house.

While I grabbed a hot shower, got into a clean pair of pajamas and wrapped myself up in a dressing gown, Grandma warmed up some chicken soup. My eye was a stunning shade of purple and completely sealed shut, and my stomach felt like someone had driven over me with a truck.

“Jack,” Grandma said, as I stepped into the kitchen, “I raised your father to have an inquisitive mind, and it served him well. But I’m a little worried about this detective agency you’re running. Being late for dinner all the time or losing a few gadgets to some juvenile delinquent is one thing. Coming home in the middle of the night soaked to the bone and covered in mud is another thing altogether.

“Technically” I said, sitting down at the kitchen table “the middle of the night isn’t until two or three in the morning”.

“Cut the sass Jack” she said, putting a steaming bowl of chicken soup in front of me and sitting down on the other side of the table. “When you got here in January, I knew I had to give you some space. You’ve had a rough go of it. And it can’t be easy living out here with me, when everyone thinks I’m some kind of crazy old witch. But there’s got to be a better way for you to make friends.

Make friends? If I hadn’t been so tired and beaten down, I would have laughed in my soup. “Don’t worry Grandma, I’ve decided to quit the detective game for good”.

“Smart boy” she said. “Why don’t I call Moses on Monday and get you a proper job at The Diner?”

I started to agree but she held up her hand. “No arguments. It’s my way or the highway from now on dear boy. Now, unless Your Majesty needs anything else, I’m going to hit the hay, and don’t wake me up in the morning, I’m sleeping in.”

Lying in bed that night, I decided to take myself off this case first thing in the morning. I’d been beaten up by a little girl, by Bucky and his buffoons all for a strange little kid and his pretty sister. His pretty sister who use to date Bucky. The image of them together burned in my mind. I won’t lie, it hurt. It hurt bad.

Saturday May 24th 9:26am – 14 Mercury Lane, The Kutcher Place

Standing on the Kutcher front stoop, I promised myself I wouldn’t mention Bucky. That was Sandra’s private business, and as a professional, I wouldn’t get involved in the private life of one of my clients.

“Jack” Sandra said, opening the door. “You don’t look so good”

“It’s nothing” I said, playing it cool “nothing at all. Getting beaten up is just part of the job. I hardly notice it. It certainly didn’t bother me last night. Not in least. Even when Bucky was using my gut for boxing practice. You remember Bucky, don’t you Sandra? Bucky King?” The heck with professionalism and privacy, this was personal. “I believe you had a love affair with him”

“Well-” she started, but I wasn’t going to give her a word in edgewise. I was just getting warmed up.

“Bucky King! The guy who runs the Riverside Boy. The guy who was the chief suspect in your burglary investigation. The guy who broke up with you! That Bucky King. Is this ringing any bells?” I was being cruel, but I couldn’t help it.

“Gosh Jack, calm down. We went out for like two weeks in grade eight. I wouldn’t exactly call it a love affair.”

“Yeah” I said, “well...”

“So, you don’t have the bike?” she asked, trying to change the topic.

“Well...but...Bucky!”

“Do you think you’ll find it before two? Ronny’s really counting on you Jack.”

She was being so business like, so cold hearted. Well if that’s how she wanted to play it, I could play it that way too. “That’s why I’m here, Miss Kutcher” I said. I’m dropping the case”

“What?”

“I think you heard me loud and clear, toots. I’m out, finished, finito benito. I’m done with this gig for good. Next time you see me, I’ll be just another sap washing dishes for a living”.

“So you’re like giving up?” she asked.

“That’s right” I said. Our eyes met, and she knew no amount of eyelash batting or hand squeezing was going to change my mind.

“Well, you wait right here, Jack Lime, because you’re breaking this to Ronny, not me”. She darted up the stairs and turned down a side hallway, leaving the front door open.

Chapter 5

[RECAP: Jack got discouraged regarding the case of the missing bike, and after getting nowhere he went to tell Sandra and Ronny that he was off the case, which of course made Sandra upset]

What was with this girl? She just couldn't let it go. I was done like dinner, and she was practically begging me to stay on the case. Out of the corner of my eye, I caught a glimpse of her flip-flops lying just inside the door. Those were the ones she had worn when she drifted into my life. It seemed like only yesterday. I looked to the left of her flip-flops and noticed Ronny's shiny black dress shoes. Beside his shoes was a pair of little sneaker's caked in mud. They must've been Ronny's too (unless Mr. Kutcher had extremely small feet). What kind of kid walks around in dress shoes instead of sneakers even filthy sneakers? My own sneakers were covered in the thick black mud that lined the river, and you didn't see me gallivanting around town wearing my Sunday best. Heck, thanks to all the rain we'd been getting, every kid who'd been down to the river in the past two weeks had sneakers covered in that exact same black mud.

And that's when it hit me like a diamond bullet shot right through the middle of my forehead. I didn't wait for Sandra. I was back on the case.

Saturday May 24th -9:44am 2 Ganymede Court, Iona Elementary

There were things that had been bothering me about this case. One, why did the perp take the broken lock? Two who in their right mind would want to steal Ronny's bike anyways? And three, what did Missy mean when she said she tried to return the bike, but the kid she was returning it to already had a new one? Obviously, the new bike she was talking about was the slick mountain bike that had been wheeled out last night just before Bucky laid into me, but who owned that bike? I had to pay Missy King another visit.

Missy was a creature of habit. I found her back at Iona Elementary hanging upside down from the monkey bars.

"Missy" I called, standing back a bit from the playground equipment.

"What do you want Lime?" she said hoping down.

"I just need you to answer a question for me" I said.

"I don't owe you nothing anymore" she said, taking a few steps towards me

"You're right" I said, taking a few steps back, "but I wonder how your brother would feel if he knew you'd tired to take some of his merchandise back to its rightful owner?"

"He wouldn't listen to a word you said" she said, with a smirk.

"Probably not" I said. "But I don't have to tell him myself. I'd just have to call in a few favors, get a few people to start talking about how they saw Missy King riding around town on a new yellow and black mountain bike with heavy duty wheels and shiny shocks".

"How d'you know what it looks like?" she hissed.

I smiled. “I saw it last night. I might even get them to mention that the bike was stolen, and that it was up for sale at the Flea Market. Heck, I might even get someone to talk to Principal Snit about the whole messy affair.

“I’ll rip you apart Lime” she said

“A name” I said, holding my ground. “Just give me the name of the kid who owns the bike, and I’ll keep my mouth shut”.

“A name?” she said hesitating.

“That’s all I want” I said, holding my hand up. “Then I’m out of your pigtails for good”.

She frowned, then glanced around the empty playground. “Tommy Delane” she said. And then Missy did something I’d never seen her do; she blushed. “Now am-scray or I’m going to pull your eyebrows out.

She didn’t have to ask me twice.

Saturday May 24th – 1:54 pm – 14 Mercury Lane, The Kutcher Place

When I rounded the corner of the Kutcher house, Ronny’s party was in full swing. Mr. and Mrs. Kutcher, Sandra, Ronny, and a few of Ronny’s friends were standing around a purple piñata in the shape of a bear riding a bike. They were all clapping in rhythm. Ronny was spinning one of his friends around like a top. The kid was blindfolded and gripping onto a short wooden bat. When Ronny was done the poor sap stumbled forward, fell on his face, tried to get back up and then fell down again. Mrs. Kutcher ran over and hoisted him up, but before she could clear out, the kid whacked her in the back of the legs with the bat. Mrs. Kutcher stumbled to the ground. Mr. Kutcher tried to get her away from the kid with the bat, but he got socked in the stomach. Sandra was yelling “Stop!” and Ronny was laughing so hard, he nearly fell over. I ran into the chaos just about got clobbered then ripped the blindfold off the poor lug. He looked like he’s just woken up from a terrible nightmare.

“What are you doing here Jack?” Sandra walked over and asked me.

“Can I talk to Ronny for a second?”

“In case you hadn’t noticed, we’re, like, in the middle of a birthday party here?”

“It’ll only take a second”

Sandra frowned and huffed. “It better be quick” she said.

“What’s going on Sandra?” Mrs. Kutcher called, leaning on Mr. Kutcher for support. “We still have to break the piñata.”

“It’ll only take a second Mum” Sandra said, and the three of us retreated around the corner of the house.

“I thought you were off the case Jack” Sandra asked as soon as we were out of sight.

“I need to speak with Ronny privately Sandra,” I said.

“No way!” she said, “what you have to say to Ronny you can say to me”

“Ronny” I said, ignoring Sandra, “I’d rather talk to you alone”.

Ronny shook his head.

“It would be better if we spoke man to man Ronny”

Ronny shook his head again

“All right” I said, stepping away from the two of them “but remember I tried to speak with you alone”.

“What’s this all about Jack?” Sandra demanded.

“Follow me” I said, and led them to the front of the house. There leaning up against the white picket fence, was Ronny’s old bike: banana seat, streamers, and one silver bell.

“You found it! You found it!” Sandra squealed, jumping up and down, clapping her hands. Ronny walked to the bike and rang the bell. It emitted a squelching ring.

“I’m afraid it’s a little soggy, Ron, but it should be as good as new by tomorrow” I said.

“Soggy?” Sandra said. “Where did you find it?”

“At the bottom of the Iona River”, I said.

Chapter 6

[***RECAP: Jack has just brought back Ronny’s bike to Ronny and Sandra, which he found in the River.]***

“You’ve got to be joking” Sandra said.

“Afraid not” I said. “It meant calling in three favors and borrowing half a dozen underwater masks, a fishing net and a U.S. Navy metal detector from a nut job who thinks he’s in the Marines, but hang the expense! So long as Ronny here has his precious bike back for his birthday”.

“How did you know? Ronny asked. His face had gone from very pale to extremely pale.

"I'm glad you asked me that Ron. You'll have to bear with me for a few minutes while I explain. You see the first clue was the lock, or the fact that there was no lock. I wondered why anyone would break your lock and then take it with them. Why would anyone want a broken lock? Then I started to wonder who would be interested in your bike, but Sandra didn't think there was anyone interested in this particular bike-" I turned to Sandra, "-because it had a certain special...quality. Ronny suggested the Riverside Boys took it and were planning to sell it at the Flea Market. I have to admit, that seemed like a long shot, but it was the only clue I had, so I followed it. That's how I ended up getting into a rather sticky situation with Missy King. But just before things got messy with Missy, she said something very interesting. She said she had tried to return the bike but the owner already had a new one"

"What?" Sandra said. "Ronny doesn't have a new bike".

"Exactly" I said. "That's what confused me. So I chalked it up to one of Missy's outrageous lies to throw me off the trail. But clearly there was a bike that had been stolen, and it was going to be sold at the Flea Market. I didn't have any other clues to go on, so I decided to check it out just in case it was Ronny's. Turns out the bike Missy was talking about was a brand new twenty one speed mountain bike. I found out this morning it belonged to a kid named Tommy Delane. His bike was stolen about a week ago and he was all broken up about it. But his Dad has got some serious cabbage to spread around, so he went out and bought him a new one. Tommy just happens to be in Missy's class and it didn't take a whole lot of digging to find out that she's got a major crush on the poor guy. So that's why she decided to return to the bike and risk getting her knees broken by her big bro, Bucky. But, like I said, Tommy already had a new bike, so Missy took the old one back before Bucky had a chance to find out it was even missing. I didn't find out the bike Bucky had wasn't Ronny's until I was getting better acquainted with Bucky's hairy knuckles. But like his sister, Bucky said something very interesting just before we had to say good bye". He said, "throw him in the river with the rest of the trash". At that time I wasn't in the condition to reflex on what he meant. However, today when I came to tell you I was off the case, I noticed Ronny's muddy sneakers and it all came together. And that's how I found your bike".

"What?" Sandra said. "That's it? I don't understand. What do Ronny's muddy sneakers have to do with anything?"

I looked over at Ronny, who was still standing beside the bike, but he didn't look back. "Good question, Sandra. Normally, a pair of muddy sneakers isn't a big deal. Heck, there's a lot of kids in Iona walking around in muddy sneakers right now. But you've got to ask yourself how did they get muddy?"

"There're lots of places they can get muddy" Ronny said in a low growl.

“That’s right Ron. There are a lot of places they can get muddy, but your sneakers are so covered in mud, that you’ve been wearing your dress shoes around. You’re wearing them right now. I’d bet dollars to doughnuts he’s been wearing those dress shoes since Friday morning”.

“That’s right!” Sandra said.

“So how’d they get so dirty? Well we’ve been getting so much rain that anyone who’s been down by the river would get their shoes covered in mud.”

“Wait a minute” Sandra said, her eyes growing wide. “You don’t mean...”she couldn’t finish. She just stared at her brother

“That’s right” I said. “There’s no need to break the lock if you’ve already got the key”.

“Oh, all right” Ronny said. “I did it! I took my stupid bike down to the river, and I rolled it in! I hate that bike! I hate it! I don’t care if you all think it’s great and how I’ve had it forever and ever and how Dad fixed it all up for me just like I wanted it. It’s stupid and it’s slow and the other kids make fun of me for it. If I just got rid of it, I thought I’d get a new bike. And I would have, if it wasn’t for this stupid face”. Ronny was crying and pointing one pale finger right at me.

“Oh, Ronny” Sandra said.

“What’s the matter big guy” Mr Kutcher asked coming around the corner of the house.

“It’s nothing Dad” Sandra said.

“Is this your old bike?” Mr. Kutcher asked, walking over to the fence. “I thought it was stolen”

“Not exactly” I said.

“Well” Mr. Kutcher said, pulling a garage door opener from his pant pocket. “I guess you won’t be wanting this then”. The garage door opened, revealing a brand new bike.

“Golly” Ronny said, running to the bike.

“A new bike! A new bike” Sandra said jumping up and down.

“And just in time for summer|” Mr. Kutcher said.

APPENDIX J

Telephone call in instructions

Study 2

Audiotape Instructions

YOU ARE IN THE **TIGER GROUP**

YOUR **ID NUMBER** IS: _____

Hi! Thank you for participating in my study! I need you to listen to the audiotape I've created for you as a part of my study. Here are the instructions:

WEEK 2 (October 24th- October 31st): I want you to listen to the audiotape 3 times but on different days. For example, you can listen to the audiotape once on Wednesday, once on Friday, and once on Sunday. It doesn't matter what 3 days you listen to it on, just make sure you listen to it 3 times during WEEK 2.

To listen to the audiotape: I want you to call this number from your home phone: [redacted]. Don't worry; it doesn't cost any money to call. It's free (toll free number). Once you have dialed the number this is what will happen:

1. Since you are from London, you will be asked to press 2 on your telephone key pad.
2. Next you will hear a Welcome Menu! Because you are in the **TIGER GROUP**, you will be asked to press 1 on your telephone key pad.
3. After you have pressed 1 on your telephone key pad, the audiotape I've created for you will start! The audiotape is about 5 minutes long! Make sure you listen to the full audiotape!
4. After the audiotape is done, you will be told to say your first and last name and your ID number then press the number (#) sign on your telephone key pad once you hear the tone! For example, after the tone I would say "Danielle Tobin ID number 66" then press the number (#) sign and then hang up. Make sure you leave your first and last name and the ID number so I know you called in!

If you make a mistake and hit the wrong button, don't worry! Just hang up and call back in.

REPEAT THIS PROCEDURE EVERYTIME YOU CALL IN!

Audiotape Instructions

YOU ARE IN THE **LION GROUP**

YOUR **ID NUMBER** IS: _____

Hi! Thank you for participating in my study! I need you to listen to the audiotape I've created for you as a part of my study.

WEEK 2 (October 24th – October 31st): I want you to listen to the audiotape 3 times but on different days. For example, you can listen to the audiotape once on Wednesday, once on Friday, and once on Sunday. It doesn't matter what 3 days you listen to it on, just make sure you listen to it 3 times during WEEK 2.

To listen to the audiotape: I want you to call this number from your home phone: [redacted]. Don't worry; it doesn't cost any money to call. It's free (toll free number). Once you have dialed the number this is what will happen:

1. Since you are from London, you will be asked to press 2 on your telephone key pad.
2. Next you will hear a Welcome Menu! Because you are in the **LION GROUP**, you will be asked to press 2 on your telephone key pad.
3. After you have pressed 2 on your telephone key pad, you will be able to choose from Chapter 1 by pressing 1 on your telephone key pad, Chapter 2 by pressing 2, or Chapter 3 by pressing 3. I want you to listen to the chapters in order. So once you have listened to Chapter 1, you can listen to Chapter 2, and then Chapter 3. Don't forget what chapter you've listened to last! The audiotape is about 5 minutes long. Make sure you listen to the full audiotape!
4. After the audiotape is done, you will be told to say your first and last name and your ID number then press the number (#) sign on your telephone key pad once you hear the tone! For example, after the tone I would say "Danielle Tobin ID number 66" then press the number (#) sign and then hang up. Make sure you leave your first and last name and the ID number so I know you called in!

If you make a mistake and hit the wrong button, don't worry! Just hang up and call back in.

REPEAT THESE STEPS EVERYTIME YOU CALL IN!

APPENDIX K

Imagery Scripts

Study 3

Imagery Script 1 – Participant 2 (Badminton)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

Remember when you picture things in your mind, like chasing your friends at the park or walking your dog, you are using imagery. Active play is when you move your body. Active play activities include things like swimming, playing balance games, kicking a ball around, or dancing. Remember, active play is activities you do on your free time. This does not mean playing on a soccer or hockey team.

Imagine that you are getting ready to go and play badminton. You are getting excited, because badminton is one of your favourite active play activities. Imagine that it is a bright and sunny day outside. You head to the park, where there is a badminton net set up. You are very excited to be playing badminton outside. It's the perfect day to be playing outside; the sun is shining with no clouds in the sky. You get to the park with your Dad, and you are excited to play badminton. You decide to start hitting the birdie back and forth with your Dad. You have you racquet in hand, as you hold the birdie in your other hand. You get ready to hit the birdie to your Dad. You take a deep breath, look at your racquet, and you take a step as you hit the birdie. See it fly over the net, a perfect hit. Your Dad hits it back. As you watch it fly over the net, you get ready to hit it. Your racquet it up, your feet are in position, and as it nears you, you hit the birdie in a quick swing. It flies over the net and your Dad swings, and misses the birdie. You feel happy that you are able show off your skills in badminton. You are having so much fun playing outside with your Dad. You Dad gets ready to serve the birdie to you. You stand there with your feet apart, and your racquet it up. You are ready to the birdie. Feel your heart beat as you are getting ready to hit the birdie. You feel confident that you will be able to hit any shot. Your Dad hits the birdie, and it comes over the net. You look at it. As it gets closer to you, you swing your arm back and hit it with your racquet. It flies over to the other side, and your Dad misses it. Now imagine it's your turn to serve again. You get ready, your heart is beating faster, since you've been playing for a while. You get into position, racquet in one hand, birdie in the other. You hit the birdie and it flies over the net on to the other side. Your Dad hits it back to you. You get ready. You swing your arm back, and hit the birdie. You and your Dad rally back and forth. You are having so much fun.

Now I want you to imagine that you are done playing badminton. Think about how much fun you had playing with your pals. Badminton is one of your favourite active play activities, and you are happy every time you get to play. Feel how tired you are after moving your body while playing. Think of how great it was to be able to show off your badminton skills.

Imagery Script 2 – Participant 2 (Biking)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next few minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Remember when you picture things in your mind, like chasing your friends at the park or walking your dog, you are using imagery. Active play is when you move your body. Active play activities include things like swimming, playing balance games, kicking a ball around, or dancing. Remember, active play is activities you do on your free time. This does not mean playing on a soccer or hockey team.

Now picture a beautiful sunny day. Image the sky is bright blue with no clouds and the sun is shining brightly. You get excited because this is a perfect day for a bike ride. You get your helmet and step outside to get on your bike. When you get outside, feel the sun hitting your skin and warming you up. Feel like small wind upon your face. You are ready for your bike ride. You get on your bike and start riding. You start with just a slow pedalling. Feel yourself get in to a good pedalling rhythm. Think about how happy you are to be biking. Think about excited you are to be doing one of your favourite active play activities. Now imagine yourself going faster. Your legs start pedalling faster and faster. Feel the breeze on your face, and you speed down the bike path. Your legs feel strong as you pedal faster. Think about how much you are enjoying being able to move your body while doing this fun activity. You are having so much fun. You enjoy biking on the path through the park. You come up to a really big hill. You feel confident you can bike up the hill. Feel the confidence building, as you approach the hill. You start pedalling faster, as you start up the hill. Feel your legs working hard. Your legs feel strong as you pedal up the hill. The last part of the hill is difficult, but you are able to get to the top. Think about how excited you are that you made it to the top of the hill. You are having a lot of fun on your bike.

Now picture yourself meeting up with your friends. You decide to all go biking together. You are even happier to be biking with your friends. You and your friends are laughing and playing together. You decide to race each other. You and your friends pick a start line. You get ready to race. On your marks….get set….go! And you're off! You start pedalling fast. Your friend is right next to your biking quickly. You are getting near the finish line. You pedal faster and faster and faster. You are putting all your strength in your legs. You win! You are so excited. Think about how much fun you are having biking with your friends.

Now I want you to picture yourself when you have finished biking. Your body is feeling tired, but you are also feeling great that you were able to bike up the big hills. Think about how much fun you had. Think about how great it was to be biking with your friends. You look forward to biking again really soon.

Imagery Script 3 – Participant 2 (Squash)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

I want you to picture where your desk is located in your classroom. Do you see it? Now, I want you to picture your bedroom. Be aware of all your belongings in your bedroom- like your closet or your bed, or even a particular book sitting on your bookshelf. When you picture things in your mind like your desk at school or your bedroom, you are using imagery. You can even use imagery to picture things when you are playing - like seeing yourself running quickly in tag or imagining how your legs move when you are riding your bike. If you are moving your body, you are doing active play. Active play activities can be skipping, swimming, kicking a ball around, or freely dancing. Remember, active play does not mean organized sport like playing on a hockey team or competing for a gymnastics club.

Now I want you to imagine yourself getting ready to go play squash. You've arrived at the squash courts. You have your squash racquet in hand, as you step onto the court. As you wait for your Dad to join you, you decide to hit the ball to practice. Feel the rubber ball in your hand, you let it go and swing with your racquet. The ball flies across the court and hits the front wall. As the ball is coming back to you, you prepare yourself to hit it again. Your racquet is up, and you are feeling ready to swing. Just as the squash ball comes closer, you swing your arm back, and then forward again, and with a big swing of the racquet you hit the ball again. The ball hits the wall hard and comes back quickly. You get prepared to hit it again. You hit the ball back and forth. You feel the strength in your arm every time you hit the ball. Feel how strong your legs are…you are able to run across the court to get the ball. Your heart starts beating faster. You are excited to be playing squash. You feel competent in your squash skills.

Now I want you to picture your Dad coming to join you on the court. You two are going to play squash together for fun. You feel excited and happy because you love being active and playing squash with your Dad. You serve the ball first. As you step into the service box, you feel very happy to be playing squash. This is one of your favourite active play activities, and you can't wait to start playing. You hit the ball with your racquet, and it flies onto the wall, and comes back. Your Dad swings and hits it back. You get prepared to hit the ball again. You and your dad hit the ball back and forth, and then you finally hit a hard shot and your dad misses it. It's now your Dad's turn to serve. You get ready for the ball to come your way. He serves it, and you hit it right back with a nice hard shot. He hits it back to you, and you hit it again, and he misses it. Think about how good it feels to be playing. You are so happy to be playing squash.

Now imagine you are done playing squash. As you walk off the court, think about how great it was to be playing such a fun game. You are so excited that you were able to play today. Your body feels tired, from playing so much.

Imagery Script 4 – Participant 2 (Dancing)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Imagine that you are getting ready to dance. You really like dancing because you like being able to get your whole body moving and it's a great way to be active. Now I want you to imagine your favourite song is playing. Hear it playing in the background. You get excited, because you love this song. You turn the volume louder. As the song starts to play, you start moving your body around to the beat. First you just start bobbing your head to the beat. Then, your foot starts to tap the floor. Listen to the beat. You start moving your feet side to side. You then get your hips moving as well. Feel the music with each movement you make. As the music starts to pick up, you get your arms moving too. Your heart starts beating faster and you dance faster. You notice you are beginning to breathe harder. Imagine your chest as a balloon. It quickly fills with air as you take a deep breath in and quickly deflates as you breathe out. Be aware of these positive messages your body is sending to you. You are having a lot of fun dancing, because you get to be active. You think dancing is a great way to pass your time. Feel how your body is moving, with each step you take. You are dancing all around the room. You are taking some big leaps in the air, as you dance. When you leap in the air, feel the strength in your legs as you push off the ground into the air. You lift your body off the ground with the strength of your legs. Your arms go up in the air as you leap across the room. As the music starts to slow down, you slow down your dancing. You are still moving your feet, and hips and arm, but your movements are slowed down.

Now imagine yourself once you are done dancing. As you are catching your breath, think about how much fun you had dancing around. You really enjoy dancing because it is a lot of fun. You look forward to being able to dance again.

Imagery Script 5 – Participant 2 (Swimming)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Now I want you to picture yourself getting ready to go swimming at the pool. You are very excited about going swimming because you think swimming is a lot of fun. When you get to the pool you get even more excited to go swimming. Picture yourself standing on the edge of the pool getting ready to jump in. 1…2…3…jump! You jump into the pool and make a big splash. Now you are getting ready to swim. You start with the front crawl. Your legs are kicking fast, as you take a stroke with each arm. Each stroke you take, your arm is stretched out as far as you can. Your arm comes out of the water as you reach far out in front of you. As your arm hits the water again, you stroke your arm underwater quickly as the opposite arm reaches out. Your legs are kicking faster and faster. You are moving so quickly. You heart is beating really fast because you've been swimming so fast. You take a second to catch your breath. Then you start swimming again. Feel the strength in your legs as you kick faster and faster. You're having lots of fun.

Now picture yourself meeting up with your friends. Your friends have come to the pool to swim too. Picture yourself swimming over to them. Now you are all swimming in the pool together. You decide to throw a ball around in the pool. Your friend throws the ball to you, and you jump and dive to catch it. You are having a great time with your friends. Now you decide to race each other to see who can swim the fastest across the pool. You start holding the side of the pool. You are getting excited. Your heart starts beating quickly. You are getting ready. You know you can swim fast. And now you're off. You and your friends are all swimming really quickly. Your arms feel strong with each stroke you take. You kick your legs faster and faster. You are getting close to the end of the pool, you and your friend are both very close. You push your legs quickly, and with your last stroke you reach your arm out and touch the end of the pool. You win! You and your friends are laughing and smiling after the race. Imagine how much fun it was to be playing with your friends. You love going to the pool and being able to move around with your friends. You enjoy being able to move your body and be active. You are really happy that you got to do one of your favourite active play activities.

Imagery Script 6 – Participant 2 (Badminton2)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next few minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

Imagine that you are getting ready to go and play badminton. You are getting excited, because badminton is one of your favourite active play activities. Imagine that it is a bright and sunny day outside. You head to the park, where there is a badminton net set up. You are very excited to be playing badminton outside. It's the perfect day to be playing outside; the sun is shining with no clouds in the sky. You get to the park with your Dad, and you are excited to play badminton. As you begin to rally with your Dad, you are feeling excited to be playing. With each hit, you watch as the birdie flies high up into the sky, as it soars over the net. You and your Dad are rallying for a while. With each hit, you feel more and more confident about your skills. It's your turn to serve the birdie. You have the birdie in hand; you take a deep breath, and look where you want the birdie to land. You swing your arm back, and drop the birdie; it hits your racquet perfectly. It flies over the net. Your dad hits it right back to you. You get prepared to hit it. Your feet at slightly apart, and your racquet it ready. You hit it back, and it flies over the net. Your dad hits it back to you again. He hits a high lob shot. As you see the birdie soar through the sky, you think that it is the perfect shot to smash the birdie. You get ready…your racquet is up. With a full force you hit the birdie downwards, and your dad tries to get it but he misses it. What a perfect shot! You feel happy that you were able to hit a perfect smash. You feel confident in your badminton abilities. You continue to rally just for fun with your dad. He serves the birdie to you and you hit it right back to him. You rally back and forth, for a really long time. Your heart is beating faster and faster because you are moving so much. Feel the strength in your arms and legs, every time you hit the birdie.

Now I want you to imagine that you are done playing badminton. Think about how much fun you had playing with your pals. Badminton is one of your favourite active play activities, and you are happy every time you get to play. This was a great way to for to pass the time. Feel how tired you are after moving your body while playing. Think of how great it was to be able to show off your badminton skills.

Imagery Script 7 – Participant 2 (Biking 2)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next few minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Now picture a beautiful sunny day. Image the sky is bright blue with no clouds and the sun is shining brightly. You get excited because this is a perfect day for a bike ride. You get your helmet and step outside to get on your bike. When you get outside, feel the sun hitting your skin and warming you up. Feel a small wind upon your face. You are ready for your bike ride. You get on your bike and start riding. You decide to go biking through the park. Imagine yourself biking on a bike path. You are excited to be outside doing one of your favourite active play activities. You start with a slow pedal; feel yourself get into a good pedalling rhythm. As you start pedalling quicker, feel the wind upon your face. Now imagine yourself going faster. Your legs start pedalling faster and faster. You are having a great time biking. . Feel your legs working hard as you pedal down the bike path. You can feel the strength in your legs. You are very skilled at biking.

Now picture yourself meeting up with your friends, on the bike path. You are even happier to be biking with your friends. You and your friends are laughing and playing together. You are biking together down the path, and come up to a big hill. You look up to the big hill, and you know that you can bike up the hill. You have confidence in your biking skills. You start biking the hill with your friends. Feel how strong your legs are. You get to the top of the hill first, and you feel really happy. You are so excited. Think about how much fun you are having biking with your friends.

Now I want you to picture yourself when you have finished biking. Your body is feeling tired, but you are also feeling great that you were able to bike up the big hills. Think about how much fun you had. Think about how great it was to be biking with your friends. You look forward to biking again really soon.

Imagery Script 8 – Participant 2 (Squash 2)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

Imagine yourself getting excited because you are going to play squash. You arrive at the courts, and put on your shoes, grab your racquet and a ball, and step onto the court. Picture yourself on the squash court getting ready to play. As you wait for your dad to join you on the court, you decide to practice hitting the ball. You swing your racquet back and forth to start just to get your arm warmed up and ready. After a few swings, you hit the ball with your racquet, and it goes off the front wall. It comes back quickly to you, but you are ready, and you hit it again. You are hitting nice long shots, right up against the wall. You are feeling confident with each hit you make. Feel how strong your arm is with every hit you make. You feel confident in your squash abilities. Once you are all warmed up, your Dad comes to join you on the court. You two are going to be a fun game of squash.

Your dad serves first. You stand there with your racquet up, and you are ready to hit the ball when it comes your way. Your dad hits it, and it goes off the wall, and comes straight for you. You are ready, and with a big swing you hit the ball back. You rally back and forth a few times, until you hit a really nice shot and your dad misses it. Feel your heart beating quickly, because you've been running so much. You take a moment to catch your breath. It's not your turn to serve. You step up to the service line, and hit the ball. It goes off the front wall, and straight towards your dad. He hits it back to you. You hit it back and forth to each other for another rally. You are having lots of fun rallying with your dad.

Now imagine you are done playing squash. As you walk off the court, think about how great it was to be playing such a fun game. You are so excited that you were able to play today. Your body feels tired, from playing so much.

Imagery Script 1 - Participant 3 (Skipping)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

Remember when you picture things in your mind, like chasing your friends at the park or walking your dog, you are using imagery. Active play is when you move your body. Active play activities include things like swimming, playing balance games, kicking a ball around, or dancing. Remember, active play is activities you do on your free time. This does not mean playing on a soccer or hockey team.

I want you to picture yourself outside, on a bright and sunny day. You grab your skipping rope, and get ready to go outside to skip. As you walk outside, you realize it is the perfect day to be outside playing skipping rope. The sun is shining and you feel a light breeze upon your face. You are looking forward to start skipping. You feel excited to be playing one of your favorite active play activities. You are holding the skipping rope with one end in each hand, with the rope on the ground just behind your feet. You take a deep breath and with a turn of your arms, the rope goes over your head. As it gets closer to the ground, your quickly lift your feet off the ground and jump over the rope. As the rope goes around you again you get ready to jump once again. You are enjoying your time skipping rope outside. You start jumping faster and faster. Your heart is beating fast. Imagine what your heart looks like as it begins to beat faster and faster as you move quicker and quicker. You notice you are beginning to breathe harder. Imagine your chest as a balloon. It quickly fills with air as you take a deep breath in and quickly deflates as you breathe out. Be aware of these positive messages your body is sending to you. Imagine your body enjoying the feeling of when you skip rope. Picture yourself with your friends jumping rope. You are all having a great time together. Think of how much fun you are having skipping rope outside with your friends.

Now picture yourself doing a criss-cross jump with the rope. As you are jumping rope, the rope is going around you and you jump up as it goes under your feet. You are getting ready to criss-cross your arms. You feel confident you can do this trick. As your turn the rope up and over your head, you cross your arms, and jump up. As you jump over the rope and it goes under your feet, you un-cross your arms back to your side. You feel happy that you were able to do the criss-cross jump. Think about how good you feel to be skilled and confident at jump rope. Think about how much fun you had jumping rope. You look forward to the next time you get to go outside and jump rope.

Imagery Script 2 – Participant 3 (Tag)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next few minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Remember when you picture things in your mind, like chasing your friends at the park or walking your dog, you are using imagery. Active play is when you move your body. Active play activities include things like swimming, playing balance games, kicking a ball around, or dancing. Remember, active play is activities you do on your free time. This does not mean playing on a soccer or hockey team.

I want you to imagine yourself in a park. The sky is filled with big white fluffy clouds and parts of the grass are covered with colorful leafs. You feel the warmth of the sun against your skin as it pops out from behind the clouds once and awhile. Imagine yourself feeling excited to move your body after a long day at school. Now I want you to picture yourself at the park with your friends. You are all getting ready to play tag. You feel really happy and excited because playing tag is one of your favorite active play activities. Now imagine your friend is it. The game is about to start, you feel your heart beating faster. You are trying to figure out where you are going to run to in order not to become it. The game starts. Picture yourself running away from the your friend who is it. Your heart is beating faster you are continue to run. You turn around and see that your friend who is it is approaching you. You can feel them behind you. They reach out with their arm to tag you, but you quickly turn so they miss you. You start running faster and faster. Your legs are moving super fast. As you begin to start running faster, you enjoy the strong breeze brushing up against your face. Feel the grass being torn up beneath you as your feet push hard off the ground. Be aware of how perfect your movements are. Imagine yourself being very skilled at running. Feel your legs muscles working hard with each stride. You realize that the person behind you cannot catch you. You feel happy because your friend can't catch you. You are running so fast. Picture yourself escaping being it, because you were able to run quickly. Feel how fast your legs are moving. Feel how fast you are breathing. You start to slow down because the person who is it, is not close to you anymore. You take deep breaths to try and catch your breath. Think of how happy you are, knowing that you did active play well. You are happy to be playing with your pals in the park.

Now, I want you to picture yourself when you have finished playing tag. Think about how much you enjoyed playing tag with your friends. You like playing tag because you think it is a lot of fun. Think about how good you were today when you were playing outside in the park. You feel satisfied and happy with your ability to do active play so well. Imagine yourself feeling excited about the next time you will do active play. You and your pals are laughing and smiling talking about how much fun tag was and how much you all enjoyed playing together.

Imagery Script 3 – Participant 3 (Biking)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next few minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Remember when you picture things in your mind, like chasing your friends at the park or walking your dog, you are using imagery. Active play is when you move your body. Active play activities include things like swimming, playing balance games, kicking a ball around, or dancing. Remember, active play is activities you do on your free time. This does not mean playing on a soccer or hockey team.

Now picture a beautiful sunny day. Image the sky is bright blue with no clouds and the sun is shining brightly. You get excited because this is a perfect day for a bike ride. You get your helmet and step outside to get on your bike. When you get outside, feel the sun hitting your skin and warming you up. Feel like small wind upon your face. You are ready for your bike ride. You get on your bike and start riding. You start with just a slow pedalling. Feel yourself get in to a good pedalling rhythm. Think about how happy you are to be biking. Think about excited you are to be doing one of your favourite active play activities. Now imagine yourself going faster. Your legs start pedalling faster and faster. Feel the breeze on your face, and you speed down the bike path. Your legs feel strong as you pedal faster. Think about how much you are enjoying being able to move your body while doing this fun activity. You are having so much fun. You enjoy biking on the path through the park. You come up to a really big hill. You feel confident you can bike up the hill. Feel the confidence building, as you approach the hill. You start pedalling faster, as you start up the hill. Feel your legs working hard. Your legs feel strong as you pedal up the hill. The last part of the hill is difficult, but you are able to get to the top. Think about how excited you are that you made it to the top of the hill. You are having a lot of fun on your bike.

Now picture yourself meeting up with your friends. You decide to all go biking together. You are even happier to be biking with your friends. You and your friends are laughing and playing together. You decide to race each other. You and your friends pick a start line. You get ready to race. On your marks….get set….go! And you're off! You start pedalling fast. Your friend is right next to your biking quickly. You are getting near the finish line. You pedal faster and faster and faster. You are putting all your strength in your legs. You win! You are so excited. Think about how much fun you are having biking with your friends.

Now I want you to picture yourself when you have finished biking. Feel how tired your body is from biking for so long. Think about how much fun you had. Think about how great it was to be biking with your friends. You look forward to be able to go biking again.

Imagery Script 4 – Participant 3 (Swimming)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Imagine you are getting ready to go and play one of your favourite active play activities, swimming. You get excited about swimming, but you are looking forward to being active and moving your body. Once you've arrived at the pool, you jump right in. As you jump in, you make a big splash. You start to swim. You decide to work on your backstroke. You turn onto your back, and start kicking with your legs. As you kick with your legs, you swing your one arm up and out of the water, and then it falls back into the water right by your ear. As that arm hit the water again, your other arm comes out. With each stroke you take, feel how strong your arms are. Feel all the muscles you are using to glide yourself across the pool. Feel the power in your legs as you kick faster and faster. You are moving so quickly. You heart is beating really fast because you've been swimming so fast. You take a second to catch your breath. Then you start swimming again. Feel the strength in your legs as you kick faster and faster. You're having lots of fun.

Now picture yourself meeting up with your friends. Your friends have come to the pool to swim too. Picture yourself swimming over to them. Now you are all swimming in the pool together. You decide to throw a ball around in the pool. Your friend throws the ball to you, and you jump and dive to catch it. You are having a great time with your friends. Now you decide to race each other to see who can swim the fastest across the pool. You start holding the side of the pool. You are getting excited. Your heart starts beating quickly. You are getting ready. You know you can swim fast. And now you're off. You and your friends are all swimming really quickly. Your arms feel strong with each stroke you take. You kick your legs faster and faster. You are getting close to the end of the pool, you and your friend are both very close. You push your legs quickly, and with your last stroke you reach your arm out and touch the end of the pool. You win! You and your friends are laughing and smiling after the race. Imagine how much fun it was to be playing with your friends. You love going to the pool and being able to move around with your friends. You are really happy that you got to do one of your favourite active play activities.

Imagery Script 5 – Participant 3 (Skipping 2)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next 5 minutes and listen to this tape I've made for you. If you would like, you can close your eyes as you listen.

I want you to picture yourself outside, on a bright and sunny day. You grab your skipping rope, and get ready to skip. You realize it is the perfect day to be skipping rope. The sun is shining and you feel a light breeze upon your face. You go outside to play with your skipping rope. You have one end of the rope in one hand, and the other end in the other hand. You start skipping. You turn the rope around your head, and just as it touches the ground by your feet you jump over it. You are enjoying your time skipping rope outside. You start jumping faster and faster. Your heart is beating quickly, because you are being very active.

Now picture yourself doing a criss-cross jump with the rope. As you are jumping rope, the rope is going around you and you jump up as it goes under your feet. You are getting ready to criss-cross your arms. You feel confident you can do this trick. As your turn the rope up and over your head, you cross your arms, and jump up. As you jump over the rope and it goes under your feet, you un-cross your arms back to your side. You feel happy that you were able to do the criss-cross jump. Think about how good you feel to be skilled and confident at jump rope.

Your friends come to join you in skipping. You grab the long rope, and hold one end while your friend holds the other end. You both turn the rope together, as you friend jumps in, and starts jumping. You are all laughing and smiling together. Now it’s your turn to jump into the rope. As your friends turn the rope, you are jumping over it with great confidence. You are now jumping on just one leg. You feel very confident in your skipping skills. Think of how much fun you had skipping rope with your friends outside.

Imagery Script 6- Participant 3 (Tag 2)

Before we begin I want you to find a quiet place, free of any distractions...a place where you can sit comfortably for the next few minutes and listen to this story I've written for you. You can close your eyes as you listen if you want. Remember when you picture things in your mind, like seeing yourself at the park with your friends, you are using imagery.

I want you to imagine yourself looking out the window of your house. It's a bright and sunny day outside. You get your running shoes on, and you run out the door, excited to go play outside. Once you get outside, the sun hits your face and warms you up. It's a perfect day to play tag. You meet up with your friends. You are all excited to play tag together. Imagine yourself feeling excited to move your body. You start the game of tag as the person who is it. You feel confident that you will be able to run after your friends and get someone it quickly. You five your friends a 5 sec head start before you start running after them. 1…2…3…4…5…ready or not here I come. And you're off. You start running towards your friends. As you are running, feel the strength in your legs with each stride you take. Feel your heart beating faster as you are running quickly. You are getting close to one of your friends. You feel confident that you can catch her and make her it. As you get closer, you run even faster. You stretch your arm out, and touch her. She's now it. You feel happy that you were able to get someone else it. Imagine your heart beating quickly, as you were running really hard. Think of how much fun it is to be playing tag with your friends. Now picture your friend being it. Your start running away from your friend who is it. You turn around and see that your friend who is it is approaching you. You can feel them behind you. They reach out with their arm to tag you, but you quickly turn so they miss you. You start running faster and faster. Your legs are moving super fast. As you begin to start running faster, you enjoy the strong breeze brushing up against your face. Feel your legs muscles working hard with each stride. You realize that the person behind you cannot catch you. You feel happy because your friend can't catch you. You are running so fast. Picture yourself escaping being it, because you were able to run quickly. Think of how happy you are, knowing that you did active play well. You are happy to be playing with your pals in the park.

Now that you are done playing, think about how much you enjoyed playing tag with your friends. Playing tag is a lot of fun. Think about how good you were today when you were it. Think about how quickly you were able to run. You are a really fast runner, which makes you really good at tag. You feel satisfied and happy with your ability to do active play so well. Imagine yourself feeling excited about the next time you will do active play. You and your pals are laughing and smiling talking about how much fun tag was and how much you all enjoyed playing together.

Imagery Script 7 – Participant 3 (Biking 2)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next few minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Now picture a beautiful sunny day. Image the sky is bright blue with no clouds and the sun is shining brightly. You get excited because this is a perfect day for a bike ride. You get your helmet and step outside to get on your bike. When you get outside, feel the sun hitting your skin and warming you up. Feel a small wind upon your face. You are ready for your bike ride. You get on your bike and start riding. You decide to go biking through the park. Imagine yourself biking on a bike path. You are excited to be outside doing one of your favourite active play activities. You start with a slow pedal; feel yourself get into a good pedalling rhythm. As you start pedalling quicker, feel the wind upon your face. Now imagine yourself going faster. Your legs start pedalling faster and faster. You are having a great time biking. . Feel your legs working hard as you pedal down the bike path. You can feel the strength in your legs. You are very skilled at biking.

Now picture yourself meeting up with your friends, on the bike path. You are even happier to be biking with your friends. You and your friends are laughing and playing together. You are biking together down the path, and come up to a big hill. You look up to the big hill, and you know that you can bike up the hill. You have confidence in your biking skills. You start biking the hill with your friends. Feel how strong your legs are. You get to the top of the hill first, and you feel really happy. You are so excited. Think about how much fun you are having biking with your friends.

Now I want you to picture yourself when you have finished biking. Your body is feeling tired, but you are also feeling great that you were able to bike up the big hills. Think about how much fun you had. Think about how great it was to be biking with your friends. You look forward to biking again really soon.

Imagery Script 8 – Participant 3 (Swimming 2)

Before we begin, I want you to find a quiet place, free of any distractions…a place where you can sit comfortably for the next 5 minutes and listen to this audio recording I've made for you. If you would like, you can close your eyes as you listen.

Now I want you to picture yourself getting ready to go swimming at the pool. You are very excited about going swimming because you think swimming is a lot of fun. When you get to the pool you get even more excited to go swimming. Picture yourself standing on the edge of the pool getting ready to jump in. 1…2…3…jump! You jump into the pool and make a big splash. Now you are getting ready to swim. You start with the front crawl. Your legs are kicking fast, as you take a stroke with each arm. Each stroke you take, your arm is stretched out as far as you can. Your arm comes out of the water as you reach far out in front of you. As your arm hits the water again, you stroke your arm underwater quickly as the opposite arm reaches out. Your legs are kicking faster and faster. You are moving so quickly. You heart is beating really fast because you've been swimming so fast. You take a second to catch your breath. Then you start swimming again. Feel the strength in your legs as you kick faster and faster. You're having lots of fun.

Now picture yourself meeting up with your friends. Your friends have come to the pool to swim too. Picture yourself swimming over to them. Now you are all swimming in the pool together. You decide to throw a ball around in the pool. Your friend throws the ball to you, and you jump and dive to catch it. You are having a great time with your friends. Now you decide to race each other to see who can swim the fastest across the pool. You start holding the side of the pool. You are getting excited. Your heart starts beating quickly. You are getting ready. You know you can swim fast. And now you're off. You and your friends are all swimming really quickly. Your arms feel strong with each stroke you take. You kick your legs faster and faster. You are getting close to the end of the pool, you and your friend are both very close. You push your legs quickly, and with your last stroke you reach your arm out and touch the end of the pool. You win! You and your friends are laughing and smiling after the race. Imagine how much fun it was to be playing with your friends. You love going to the pool and being able to move around with your friends. You enjoy being able to move your body and be active. You are really happy that you got to do one of your favourite active play activities.

APPENDIX L

Letter of Information, Consent Form and Assent Form

Study 1, Study 2, and Study 3

Parent/Guardian Letter of Information

Imagery Use and Psychological Needs Satisfaction among Children in Leisure Time Physical Activity – Study 2

Your child is being asked to participate in a research study conducted by Dr. Craig Hall from the School of Kinesiology at the University of Western Ontario. Working with Dr. Krista Munroe from the Faculty of Human Kinetics at the University of Windsor, imagery use in leisure time physical activity will be investigated.

If you have any questions or concerns about the research, please feel free to contact Dr. Craig Hall at [redacted]

Purpose of the Study

The purpose of the present study will be to further validate the Physical Activity Imagery Questionnaire for Children (PAIQ-C) and the Psychological Needs Satisfaction in Exercise Scale (PNSES) for children, and examine the relationship between imagery use and psychological needs satisfaction, all with children 7-14 years.

Procedures

If you volunteer your child to participate in this study, we would ask he/she do the following:

The participants will be asked to fill out two questionnaires: The first questionnaire will be the Physical Activity Imagery Questionnaire for Children (PAIQ-C) which assess how frequently children 7-14 years of age employ imagery during their leisure-time physical activity using 11 questions. The second questionnaire is the Psychological Needs Satisfaction in Exercise Scale (PNSES) for children which will assess how one feels when they engage in physical activity. The questionnaire is composed on 16 questions. The completion of both questionnaires will take approximately 10-20 minutes, with younger children taking longer to complete the questionnaires. The questionnaires will be completed during pick-up and drop-off times at the Huron Flats Parking Lot at The University of Western Ontario. Subjects will have the opportunity to enter their names into a draw for a chance to win one of four $25 gift certificates to a local sporting goods store

Feedback from the Study

The investigator will provide feedback to you upon request. If you have any additional concerns or questions you can email or call the investigator at the address or number provided above. Please keep this Letter of Information.

Potential Risks and Discomforts

Since these questionnaires have been employed in the past and there haven't been any discomforts, the risk is very small.

Potential Benefits to subjects and/or to Society

This study is part of a larger study examining imagery use in leisure physical activity. The information gained from this study may be used in further research study exploring imagery use and psychological needs among genders. The researchers may gain valuable insight regarding imagery use during leisure time physical activity among children.

Confidentiality

Any information that is obtained in connection with this study and that can be identified with your child will remain confidential and will be disclosed only with your permission. All responses from the questionnaires will be kept in strict confidentiality. The information obtained from the study will not be used for any purpose other than the research and the communication of the results. All information obtained from the questionnaires will be kept in a locked cabinet in the investigator's office. There is no access to this cabinet by anyone other than the investigator.

Participation and Withdrawal

Participation in this study is voluntary. Your child can choose whether to be in this study or not. If your child volunteers to be in this study, he/she may withdraw at any time with no impact on your child's participation in Sport Western. You may remove your child's data from the study. Your child may also refuse to answer any questions he/she doesn't want to answer and still remain in the study. Your child will still be entered into the draw even if he/she doesn't complete both questionnaires.

Rights of Subjects

If you have questions regarding your rights as a research subject, contact:
Office of Research Ethics
The University of Western Ontario
[redacted]

Assent Form

Imagery Use and Psychological Needs Satisfaction among Children in Leisure Time Physical Activity – Study 2

Purpose of the Study

We are two student researchers who want to understand the pictures you create in your mind about physical activity and why you like to participate in physical activity. Your parent/guardian knows we are asking you questions.

Procedure

We would like you to fill out two questionnaires about these topics. The questionnaires should not take longer than 20 minutes and can be returned to us when you have finished.

Confidentiality

We want you to know that we will not be telling anyone what you answer. Everything you write down will only be read by us. The only exception is if you tell us that someone has been hurting you. If we think that you are being hurt or abused we will need to tell your parents or someone else who can help you. Otherwise, we promise to keep everything that you tell me private.

Potential Risks and Discomforts

Other kids have answers these questionnaires in the past and there haven't been any discomforts, the risk is very small.

Potential Benefits to subjects and/or to Society

This study is part of a bigger study looking at pictures children create in their mind about physical activity. The information from this study may be used in other research studies. The researchers may gain valuable insight regarding the pictures children create in their mind about physical activity

Participation

You can ask questions at any time, now or later. If you decide to answer the questions you can stop answering them at any time, and you don't have to answer any question you do not want to answer. It's entirely up to you. You won't get into any trouble if you say "no." If you don't want to be in the study, just say so, and even if you say yes now, you can still change your mind later. Would you like to tell us about the pictures that you see in your mind during activities?

I understand what I am being asked to do to be in this study, and I agree to be in this study.

Parent/Guardian Letter of Information

Children's Imagery Use in Leisure Time Physical Activity – Study 3

Your child is being asked to participate in a research study conducted by Dr. Craig Hall from the School of Kinesiology at the University of Western Ontario. Working with Dr. Krista Munroe from the Faculty of Human Kinetics at the University of Windsor, imagery use in leisure time physical activity will be investigated.

If you have any questions or concerns about the research, please feel free to contact Dr. Craig Hall at [redacted]

Purpose of the Letter

The purpose of this letter is to provide you with information required for you to make an informed decision regarding participation in this research.

Purpose of this Study

The purpose of the present study is to see if a 6 week imagery intervention can help increase physical activity in children in grades 4-6 (9-12 years old). Imagery is creating or re-creating images in your mind. The study will attempt to understand if using imagery will influence children's motivation to participate in leisure-time physical activity.

Study Procedures

If you volunteer your child to participate in this study, we would ask he/she do the following:
Week 1: Your child will be asked to meet the researcher with his/her class to fill out several questionnaires (approx. 15-20 minutes). The first questionnaire will assess how frequently children employ imagery during their leisure time physical activity (11 items). The second questionnaire will assess how one feels when they engage in physical activity (16 items). The third questionnaire, comprised of one item, will assess the child's intention to engage in physical activity over a specific amount of time.). The final questionnaire assesses physical activity during free time (10 items). Your child will be given a pedometer (approximately the size of a child's palm), which will measure physical activity patterns and instructed on how to use the device (i.e., placement on the hip). Your child will be asked to wear the pedometer for the duration of the study (i.e., during all waking hours except when in water, during organized sports

or physical education classes, or sleeping). The pedometer is small and non-obtrusive. Your child will be asked to meet with the researcher once a week for the next 5 weeks.

Week 2-4: Your child will meet with the researcher at school, during a designated time by the teacher, to collect the physical activity data from the pedometer and complete the questionnaire assesses physical activity during free time (9 items) and the one item intention to engage in active play question. During this meeting your child will be provided with a 1-800 number in which they call and enter their identification number provided by the researcher. The researcher will assist your child, as they will be expected to repeat this procedure over the next week from home. After your child has entered their identification number they will proceed to listen to an audiotape on imagery in physical activity or a children's short story (age appropriate and neutral in nature). The audiotape will last no longer than 5 minutes. Your child will be asked to listen to this audiotape three times before the next meeting with the researcher following the same procedure (i.e., dial 1-800 number, enter ID number, and listen to audiotape).

Week 5: Your child will be asked to meet with the researcher at school to collect the physical activity data from the pedometer and to complete the same questionnaires as those given in Week 1.

3 months later: You child will meet with the researcher one last time, 3 months after the completion of the study. Your child will be asked to complete the same questionnaires from Week 1 and Week 5 of the study.

Possible Risks and Harms

There are no known risks associated with taking part in this study. The questionnaires that will be administered have been employed in the past and we have received no indication of any reported discomfort. Also, pedometers are an accurate, reliable, and safe measure of children's physical activity. The imagery and short story audiotape will pose no risk.

Possible Benefits

Although there are no known benefits to the participants, there are possible benefits to society. This study is part of a larger study examining imagery use in active play. The information gained from this study may be used in further research studies exploring imagery use and psychological needs among children. The researchers may gain valuable insight regarding imagery use during active play among children and imagery as a motivator for children to be physically active.

Compensation

A class who successfully complete the 6-week study will receive a gift certificate to Sport Chek as an incentive. Successful completion of the intervention involves (1) the class and researcher meet once a week for 5 weeks and (2) the participants makes 3 phone calls per week for 4 weeks (Weeks 1 through 4 for a total of 12 phone calls) in order to listen to the designated audiotape imagery or short story. Children who call in 12 times (3 phone calls per week for 4 weeks) and meet with the researcher to return their pedometer and fill out the questionnaire package (Week

5) will add to the total of the class gift certificate. The class will also receive another gift certificate when the class participates in the 3-month follow up. If a participant decides to withdraw from the study at any point prior to completion, the total of their participation will be added to the final gift card total for the class.

Voluntary Participation

Participation in this study is voluntary. Your child may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on their future academics. You may remove your child's data from the study. Your child may also refuse to answer any questions he/she doesn't want to answer and still remain in the study. Each time the researcher and your child meet, your child will be provided with a re-assent form in order to confirm they want to continue to participate in the study. However, you or your child may withdraw at any time throughout the study.

Confidentiality

All data collected will remain confidential and accessible only to the investigators of this study. If the results are published, your child's name will not be used. If your child chooses to withdraw from this study, their data will be removed and destroyed from our database. All responses from the questionnaires will be kept in strict confidentiality. The information collected from the pedometer will be kept confidential. The information obtained from the study will not be used for any purpose other than the research and the communication of the results.

Contacts for Further Information

If you require any further information regarding this research project or your child's participation in the study you may contact Dr. Craig Hall at [redacted] You may also contact Danielle Tobin at [redacted]

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics [redacted]

Publication

If the results of the study are published, your name will not be used. If you would like to receive a copy of any potential study results, please contact Dr. Craig Hall at [redacted] In addition, a written summary of the study's findings will be posted at the University of Windsor's Ethics Board website by December 2013 (www.uwindsor.ca/reb). The study's findings will also be posted in the school's monthly newsletter. If you have any additional concerns or questions you can email or call the investigator at the address or number provided above. Please keep this Letter of Information.

This letter is yours to keep for future reference.

Consent Form

Project Title: Children's Imagery Use in Leisure Time Physical Activity –Study 3

Study Investigators Names: Dr. Craig Hall and Danielle Tobin

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Child's Name: _____

Parent / Legal Guardian / Legally Authorized Representative Print: _____

Parent / Legal Guardian / Legally Authorized Representative Sign: _____

Parent / Legal Guardian / Legally Authorized Representative Date: _____

Person Obtaining Informed Consent (please print): _____

Signature: _____

Date: _____

Children's Assent Form

Study Title: Children's Imagery Use in Leisure Time Physical Activity – Study 3
Investigators: Dr. Craig Hall and Danielle Tobin

Purpose of the Study
I am a student researcher who wants to understand the pictures you create in your mind about active play. **Active play** can be riding your bike, dancing, playing tag, kicking a ball, or going swimming. It makes you sweat, makes your legs feel tired, or makes you breathe harder. Your parent/guardian knows we are asking you questions.

What will happen to you?
If you want to be in the study I will ask you to do the following. The first time we meet you will be asked to fill out questionnaires about the pictures you create in your mind when you are playing. During the first meeting, you will then be given a small electronic device. This will let me see how much you are moving when you play each day. You will be asked to wear it (on your waistband) all day except when in water, during sports or gym class, or sleeping. You will be asked to make a phone call from your home where you will listen to a 5 minute story I've made for you. I will come to your school to meet your class once a week for the next few weeks. I'll ask you to fill out questionnaires again, with the same questions as the first week. The final week I will ask you to answer some questions on the pictures you create in your mind about active play.

Will there be any tests?
No there will not be any tests or marks on the report card regarding this study.

Will the study help you?
No this study will not help you directly but in the future it might help other children participate in active play.

What if you have any questions?
You can ask questions at any time, now or later.

Confidentiality
We want you to know that we will not be telling anyone what you answer. Everything you write down will only be read by us. The only exception is if you tell us that someone has been hurting you. If we think that you are being hurt or abused we will need to tell your parents or someone else who can help you. Otherwise, everything that you tell us is private.

Do you have to be in the study?

You do not have to be in the study. It's entirely up to you. You won't get into any trouble if you say "no." If you don't want to be in the study, just say so, and even if you say yes now, you can still change your mind later.

I want to participate in the study

Print name of Child: _____ Age:_____

Signature of Child: _____ Date:_____

Signature of person obtaining assent:_____ Date_____

Project Title: Active Play Imagery

Principal Investigator: Dr. Craig Hall, Kinesiology Department, Western University

Children's Active Play Imagery

Invitation to Participate

Based on the recommendations of your child's physical education teacher, your child is being invited to participate in a research study conducted by Dr. Craig Hall from the School of Kinesiology at Western University. Working with Dr. Alan Edmunds and Danielle Tobin from Western University, active play imagery use will be investigated.

If you have any questions or concerns about the research, please feel free to contact Dr. Craig Hall at [redacted]

Purpose of the Letter

The purpose of this letter is to provide you with information required for you to make an informed decision regarding your child's participation in this research.

Purpose of this Study

The purpose of the present study is to see if a 20 week active play imagery intervention can help increase physical activity in children in grade 6 (10-12 years old). The study will attempt to understand if using imagery will influence children's motivation to participate in leisure-time physical activity. Given the general decline in children's physical activity levels, imagery could be a strategy to help increase their levels.

Study Procedures

If you volunteer your child to participate in this study, we would ask he/she do the following:
Week 1: Your child will be asked to meet the researcher at their school, in a room designated by their teachers, to fill out several questionnaires (approximately 15-20 minutes). The first questionnaire will assess how frequently children employ imagery during their leisure time physical activity (11 items). The second questionnaire will assess reasons for participation in leisure time physical activity (16 items). The third questionnaire, comprised of one item, will assess the child's intention to engage in physical activity over a specific amount of time. The final questionnaire assesses physical activity during free time (9 items). Your child will be given an accelerometer (approximately the size of a child's palm), which will measure physical activity patterns and instructed on how to use the device (i.e., placement on the hip). Your child will be asked to wear the accelerometer for the duration of the study (i.e., during all waking hours except

when in water, during organized sports or physical education classes, or sleeping). The accelerometer is small and non-obtrusive. Your child will be asked to meet with the researcher once a week for the next 20 weeks at school, for approximately 5-10 minutes. The meetings will take place in a room designated by the teacher.

This research is a single-subject-multiple baseline study. This means that each participant in the study starts the intervention at different times. However, the intervention is exactly the same for all participants. When your child starts the intervention, they will be asked to meet with the researcher once a week for approximately 5-10 minutes, to listen to an imagery script. The imagery script will be on an audio-recording, and they will be asked to bring it home and listen to it two more times. The following week, they will be asked to bring back the audio recording and get a new one to listen too. All imagery scripts will be based on active play activities. Each week that your child listens to an audio recording they will also be asked to complete two questionnaires from Week 1 (i.e. the intentions to engage in active play and the physical activity questionnaire). In addition, the participants will be asked to bring their accelerometer in each so that the researcher can take note of their physical activity from the past week. At the end of the 20 week intervention, your child will be asked to complete all the same questionnaires as the first week.

Possible Risks and Harms

There are no known risks associated with taking part in this study. The questionnaires that will be administered have been employed in the past and we have received no indication of any reported discomfort. Also, accelerometers are an accurate, reliable, and safe measure of children's physical activity. The imagery audiotapes will pose no risk.

Possible Benefits

Although there are no known benefits to the participants, there are possible benefits to society. This study is part of a larger study examining imagery use in active play. The information gained from this study may be used in further research studies exploring imagery use in active play. The researchers may gain valuable insight regarding imagery use during active play among children and imagery as a motivator for children to be physically active.

Compensation

Participants in the study will be compensated with a $5 gift certificate to Sport Chek each week when they meet with the researcher.

Voluntary Participation

Participation in this study is voluntary. Your child may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on their future academics. You may remove your child's data from the study. Your child may also refuse to answer any questions he/she doesn't want to answer and still remain in the study. Each time the researcher and your child meet, your child will be provided with a re-assent form in order to confirm they want to continue to participate in the study. However, you or your child may withdraw at any time throughout the study.

Confidentiality

All data collected will remain confidential and accessible only to the investigators of this study. The data will be kept locked in a cabinet, that only the researchers have access to. Data will be kept for 5 years, and then shredded. If the results are published, your child's name will not be used. If your child chooses to withdraw from this study, their data will be removed and destroyed from our database. All responses from the questionnaires will be kept in strict confidentiality. The information collected from the accelerometers will be kept confidential. The information obtained from the study will not be used for any purpose other than the research and the communication of the results.

Contacts for Further Information

If you require any further information regarding this research project or your child's participation in the study you may contact Dr. Craig Hall at [redacted]
You may also contact Dr. Alan Edmonds at [redacted] or Danielle Tobin at [redacted]

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics [redacted]

Publication

If the results of the study are published, neither you nor your child's name will be used. If you would like to receive a copy of any potential study results, please contact Dr. Craig Hall at [redacted]If you have any additional concerns or questions you can email or call the investigator at the address or number provided above. Please keep this Letter of Information.

This letter is yours to keep for future reference.

Consent Form

Project Title: Active Play Imagery Intervention

Study Investigator's Name: Dr. Craig Hall, Dr. Alan Edmonds, and Danielle Tobin

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Child's Name: _____

Parent / Legal Guardian / Legally Authorized Representative (if applicable) Print: _____

Parent / Legal Guardian / Legally Authorized Representative (if applicable) Sign: _____

Parent / Legal Guardian / Legally Authorized Representative (if applicable) Date: _____

Person Obtaining Informed Consent (please print): _____

Signature: _____

Date: _____

Project Title: Active Play Imagery Intervention
Principal Investigator: Dr. Craig Hall, Kinesiology Department, and Danielle Tobin

Assent Letter

Why you are here.

I am a student researcher who wants to understand the pictures you create in your mind about active play. **Active play** can be riding your bike, dancing, playing tag, kicking a ball, or going swimming. It makes you sweat, makes your legs feel tired, or makes you breathe harder. Your parent/guardian knows we are asking you questions

Why am I doing this study?
We just want to know about the pictures you create in your mind about active play.

What will happen to you?
If you want to be in the study I will ask you to do the following. The first time we meet you will be asked to fill out questionnaires about the pictures you create in your mind when you are playing. During the first meeting, you will then be given a small electronic device. This will let me see how much you are moving when you play each day. You will be asked to wear it (on your waistband) all day except when in water, during sports or gym class, or sleeping. You will be asked to listen to a 5 minute story I've made for you, on an audio recording I will provide you with. You will also take home the audio recording and asked to listen to the story two more times during the week. You will be asked to bring the audio recording back each week to get a new story to listen to. I will come to your school to meet with you once a week for the next few weeks. I'll ask you to fill out questionnaires again, with the same questions as the first week. Each week you will get to listen to a new story that I have made for you. The final week I will ask you to answer some questions on the pictures you create in your mind about active play.

Will there be any tests?
No there will not be any tests or marks on the report card regarding this study.

Will the study help you?
No this study will not help you directly but in the future it might help other children participate in active play.

Possible Risks and Harms
There are no known risks associated with taking part in this study.

What if you have any questions?
You can ask questions at any time, now or later. You can ask the researcher any questions, either in person, or by email at [redacted] at any time.

Confidentiality
We want you to know that we will not be telling anyone what you answer. Everything you write down will only be read by us. The only exception is if you tell us that someone has been hurting you. If we think that you are being hurt or abused we will need to tell your parents or someone else who can help you. Otherwise, everything that you tell us is private.

Do you have to be in the study?
You do not have to be in the study. No one will be mad at you if you do not want to do this. If you do not want to be in the study, just say so. Even if you say yes, you can change your mind later. It is up to you.

I want to participate in this study.

Print Name of Child _____ Date_____

Signature of Child _____

Age _____

Signature of Person Obtaining Consent: _____

Name of person obtaining consent (printed): _____

Date: _____

APPENDIX M

The University of Western Ontario

Research Ethics Board Approval Notices

Research Western

Use of Human Participants - Ethics Approval Notice

Principal Investigator: Dr. Craig Hall
Review Number: 17883S
Review Level: Full Board
Approved Local Adult Participants: 0
Approved Local Minor Participants: 200
Protocol Title: Imagery Use in Children's Leisure Time Physical Activity – Study 2
Department & Institution: Kinesiology,University of Western Ontario
Sponsor: Social Sciences and Humanities Research Council

Ethics Approval Date: May 24, 2011 **Expiry Date:** May 31, 2012

Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
UWO Protocol		
Letter of Information & Consent	Letter of Information ONLY	

This is to notify you that The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the applicable laws and regulations of Ontario has granted approval to the above named research study on the approval date noted above.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the NMREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

Members of the NMREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussions related to, nor vote on, such studies when they are presented to the NMREB.

The Chair of the NMREB is Dr. Riley Hinson. The UWO NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Ethics Officer to Contact for Further Information

Grace Kelly	Janice Sutherland

This is an official document. Please retain the original in your files.

Western Research

Research Ethics

Use of Human Participants - Ethics Approval Notice

Principal Investigator: Dr. Craig Hall
File Number: 102812
Review Level: Full Board
Approved Local Adult Participants: 0
Approved Local Minor Participants: 40
Protocol Title: Children's Imagery Use and Leisure Time Physical Activity - Study 3
Department & Institution: Health Sciences/Kinesiology,Western University
Sponsor:
Ethics Approval Date: September 13, 2012 **Expiry Date:** December 20, 2013

Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
Western University Protocol		
Other	Recruiting Script	2012/08/20
Other	Imagery Scripts for Relatedness	2012/08/20
Other	Imagery Scripts for Competence	2012/08/20
Revised Letter of Information & Consent	Letter of Information to the Parents - Revised	2012/08/17

This is to notify you that The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the applicable laws and regulations of Ontario has granted approval to the above named research study on the approval date noted above.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the NMREB's periodic requests for surveillance and monitoring information.

Members of the NMREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussions related to, nor vote on, such studies when they are presented to the NMREB.

The Chair of the NMREB is Dr. Riley Hinson. The NMREB is registered with the U.S. Department of Health & Human Services under t gis n number IRB 00000941

[redacted]

Ethics Officer to Contact for Further Information

'Grace Kelly

Janice Sutherland

This is an official document. Please retain the original in your files.

Western Research

Research Ethics

Use of Human Participants - Ethics Approval Notice

Principal Investigator: Dr. Craig Hall
File Number: 104154
Review Level: Full Board
Protocol Title: Active Play Imagery Intervention
Department & Institution: Health Sciences\Kinesiology, Western University
Sponsor:
Ethics Approval Date: October 02, 2013 **Expiry Date:** July 31, 2014

Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
Instruments	Example of Imagery Script	
Instruments	Intention to engage in active play (I-AP)	
Instruments	Children's Active Play Imagery Questionnaire (CAPIQ)	
Instruments	Situational Motivation Scale (SIMS)	
Letter of Information & Consent	Consent Form for Parents	
Western University Protocol		2013/08/06
Letter of Information & Consent	Letter of Information Revised	
Response to Board Recommendations	Response to revisions	
Assent	Assent Form Revised	
Instruments	Physical Activity Questionnaire (PAQ)	
Recommendations Form	Recommendations	2013/09/13

This is to notify you that The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the applicable laws and regulations of Ontario has granted approval to the above named research study on the approval date noted above.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the NMREB's periodic requests for surveillance and monitoring information.

Members of the NMREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussions related to, nor vote on, such studies when they are presented to the NMREB.

The Chair of the NMREB is Dr. Riley Hinson. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Ethics Officer to Contact for Further Information

Grace Kelly	[redacted]	Erika Basile

This is an official document. Please retain the original in your files.

CURRICULUM VITAE

Danielle Tobin, PhD.

EDUCATION

2011-Present PhD. Candidate, The University of Western Ontario, London, Ontario

2009-2011 M.A. Kinesiology, The University of Western Ontario, London, Ontario

2005-2009 B.A. with a Specialization in Sport Psychology (Honours), Laurentian University Sudbury, Ontario

AWARDS AND SCHOLARSHIPS

2014 – 2015 Social Science and Humanities Research Council (SSHRC), Doctoral Fellowship, Value $20,000/ year
2014-2014 Ontario Graduate Scholarship (OGS), $15,000/year, declined in lieu of SSHRC scholarship
2012 – 2013 Ontario Graduate Scholarship (OGS), $15,000/year,
2008-2009 Laurentian University entrance scholarship, $1,000.

PUBLISHED ARTICLES

Tobin, D., Munroe-Chandler, K.J., Hall, C.R., Guerrero, M.D., Shirazipour, C.H., & Cooke, L.M. (2015) The relationship between children's active play imagery and basic psychological needs. *International Journal of Sport and Exercise Psycholog*, doi: 10.1080/1612197X.2015.1069875

Guerrero, M. D., **Tobin, D.,** Munroe-Chandler, K. J., & Hall, C. R. (2015). Tigers and lions oh my! Effect of a guided imagery intervention on children's active. *Journal of Applied Sport Psychology*. (ahead-of-print). 1-18. doi: 10.1080/10413200.2015.1030797.

Tobin, D., Guerrero, M. D., Hall, C.R., & Munroe-Chandler, K. J. Can the school environment influence children's physical activity levels? A Comparison of a Private and a Public Elementary School. Submitted to *Journal of Physical Activity and Health*

Munroe-Chandler, K. J., Hall, C. R., Guerrero, M. D., & **Tobin, D.** (2015). Call me maybe: Delivering an imagery intervention to children through an automated telephone system. *Journal of Sport Sciences, 3* (2). doi:10.17265/2332-7839/2015.02.003

Pope, J.P., Hall, C.R., & **Tobin, D.** (2014). How do competitive level coaches identify with their roles as a coach?: Exploring coach identity through a role identity theory lens.

Identity: An International Journal of Theory and Research, 14, 136-152. doi: 10.1080/15283488.2014.897951

Cooke, L.M., Munroe-Chandler, K.J., Hall, C.R., **Tobin, D.,** & Guerrero, M.D. (2014). Development of the children's active play imagery questionnaire. *Journal of Sport Sciences,* doi:10.1080/02640414.2013.865250.

Tobin, D., Nadalin, E.J., Munroe-Chandler, K.J., & Hall, C.R. (2013). Children's active play imagery. *Psychology of Sport and Exercise, 14,* 317-378.

Tobin, D., & Hall, C.R. (2012). *More food for thought on imagery perspective and preference* [Peer Commentary on the article "A default hypothesis of the development of internal and external imagery perspectives by T. Morris & M. Spittle]. *Journal of Mental Imagery, 36* (1 &2).

Westlund, N., Pope, J.P., & **Tobin, D.** (2012). Cognitive general imagery: The forgotten imagery function? *Journal of Imagery Research in Sport and Physical Activity,* 7(1), article 1.

PUBLISHED ABSTRACTS

Munroe-Chandler, K. J., Hall, C.R., Guerrero, M. D., & **Tobin, D.** (2014). A phone call is all it takes: Improving levels of active play with an automated telephone system. [Abstract] *Journal of Physical Activity and Health, 11* (Suppl.), S138.

Tobin, D., Guerrero, M.D., Munroe-Chandler, K.J., & Hall, C.R., (2013, June). Examining the effects of an active play imagery intervention on the basic psychological needs. [Abstract]. *Journal of Sport and Exercise Psychology, 35,* (Suppl.) S116

Munroe-Chandler, K.J., Hall, C.R., Cooke, L., **Tobin, D.,** & Guerrero, M.D. (2013, June). CAPIQ: A measure of children's imagery use during active play. [Abstract]. *Journal of Sport and Exercise Psychology, 35,* (Suppl.) S102

Hall, N.D., Clive, N., Melnychuk, N., **Tobin, D.** (2012, June). Imagery on the fly: Imagery use by physical educators. [Abstract]. *Journal of Sport and Exercise Psychology, 34,* (Suppl.), S232.

Tobin, D., Nadalin, E.J., Munroe-Chandler, K.J., & Hall, C.R. (2011, June) Age Differences in imagery use by children in leisure time physical activity [Abstract]. *Journal of Sport and Exercise Psychology, 33,* (Suppl.), S190.

CONFERENCE PRESENTATIONS AND POSTERS

Munroe-Chandler, K. J., Hall, C. R., Guerrero, M. D., & **Tobin, D.** (2014, May). A phone call is all it takes: Improving levels of active play with an automated telephone system. Presented at the Active Play Global Summit, Toronto, Ontario, Canada.

Tobin, D., & Pope, J.P. (2013, October). Examining the influence of interpersonal coaching styles on competitive athlete's motives. Presented at the Canada Society for Psychomotor Learning and Sport Psychology, Kelowna, British-Columbia, Canada.

Guerrero, M.D., Hoffman, M.D., **Tobin, D.,** Munroe-Chandler, K.J., & Hall, C.R. (2013, October). Lessons Learned: Children's perceptions of an imagery intervention aimed to increase physical activity. Presented at the Canadian Society for Psychomotor Learning and Sport Psychology, Kelowna, British-Columbia, Canada

Munroe-Chandler, K.J., Hall, C.R., Guerrero, M.D., & **Tobin, D.,** (2013, October). Can an imagery intervention improve children's levels of active play? A pedometer study. Presented at the Canadian Society for Psychomotor Learning and Sport Psychology, Kelowna, Bristish-Columbia, Canada

Tobin, D., Guerrero, M.D., Munroe-Chandler, K.J., & Hall, C.R., (2013, June). Examining the effects of an active play imagery intervention on the basic psychological needs. Presented at the North American Society for the Psychology of Sport and Physical Activity in New Orleans, Louisiana

Munroe-Chandler, K.J., Hall, C.R., Cooke, L., **Tobin, D.,** & Guerrero, M.D. (2013, June). CAPIQ: A measure of children's imagery use during active play. Presented at the North American Society for the Psychology of Sport and Physical Activity in New Orleans, Louisiana

Guerrero, M.D., **Tobin, D.,** Munroe-Chandler, K.J., Hall, C.R. (2013, March). Imagine a world without play: Increasing physical activity behaviours in children through an imagery intervention. Presented at Eastern Canadian Sport and Exercise Psychology Symposium, in St-Catherines, Ontario, Canada

Tobin, D., Munroe-Chandler, K.J., Hall, C.R., Guerrero, M.D., Shirazipour, C., & Cooke, L.M. (2012, November). The Relationship between Children's Active Play Imagery and Basic Psychological Needs. Presented at the Canadian Society for Psychomotor Learning and Sport Psychology, Halifax, Nova Scotia, Canada

Guerrero, M.D., Cooke, L.M., **Tobin, D.,** Munroe-Chandler, K.J., & Hall, C.R. (2012, November). Assessing imagery use in active play: Validation of the Children's Active Play Imagery Questionnaire. Presented at the Canadian Society for Psychomotor Learning and Sport Psychology, Halifax, Nova Scotia, Canada

Munroe-Chandler, K.J., Hall, C.R., Cooke, L., **Tobin, D.,** & Guerrero, M.D. (2012, October). CAPIQ: A Measure of children's imagery use during active play. Sports Canada Research Initiative, Ottawa, Ontario, Canada.

Hall, N.D., Clive, N., Melnychuk, N., **Tobin, D.** (2012, June). *Imagery on the fly: Imagery use by physical educators.* Poster presentation at North American Society of Psychology of Sport and Physical Activity, Honolulu, Hawaii

Munroe-Chandler, K.J., Hall, C.R., **Tobin, D.,** & Nadalin, E.J. (2011, November). *Children's Use of Imagery as a Potential Motivational Tool for Enhancing Engagement in Active Play*. Poster presentation at Sport Canada Research Initiative, Ottawa, Ontario, Canada.

Nadalin, E.J., Munroe-Chandler, K.J., Hall, C.R., & **Tobin, D.** (2011, October). *Children's Use of Active Play Imagery.* Poster presentation at Canadian Society for Psychomotor Learning and Sport Psychology, Winnipeg, Manitoba, Canada

Tobin, D., Nadalin, E.J., Hall, C.R., & Munroe-Chandler, K.J. (2011, June). *Age differences in imagery use by children in leisure time physical activities.* Oral presentation at the North American Society for the Psychology of Sport and Physical Activity, Burlington, Vermont, USA.

Tobin, D., Nadalin, E.J., Hall, C.R., & Munroe-Chandler, K.J. (2011, March). *Age differences in imagery use by children in leisure time physical activities-preliminary results.* Oral presentation at the Eastern Canadian Sport and Exercise Psychology Symposium, Kitchener-Waterloo, Ontario, Canada

Nadalin, E.J., Munroe-Chandler, K.J., Hall, C.R., & **Tobin, D.** (2011, March) *Gender differences in Leisure Time Physical Activity Imagery Use in children aged 7-14.* Oral presentation at the Eastern Canadian Sport and Exercise Psychology Symposium, Kitchener-Waterloo, Ontario, Canada

Munroe-Chandler, K.J., Hall, C.R., Nadalin, E.J., & **Tobin, D.** (2010, October). *Imagery use in children's leisure time physical activities – Study1*. Poster presentation at the Sport Canada Research Initiative Conference, Ottawa, Ontario, Canada

TEACHING EXPERIENCE

Invited Lecture

September 2013 - 3rd International Symposium for Collaboration in Research, Teaching and Experience

Guest Lecture

October 2013 – KIN 2276; Exercise Psychology. Title: Physical Activity Intervention; Active Play Imagery

April 2013 – KIN 3474 – Psychological interventions in sport, exercise, and rehabilitations. Title: Physical Activity and Children

March 2013– KIN 374 – Psychological interventions in sport, exercise, and rehabilitation. Title: Exercise Imagery; Self-Talk in Sport

August 2010/2011 Elite Track and Field Camps. Title: Imagery, Goal Setting, Mental Training Skills

Teaching Assistant

September – December 2014 The University of Western Ontario. Exercise Psychology

January - April 2012 The University of Western Ontario. Psychological Interventions in Exercise, Sport, and Injury Rehabilitations

January – April 2011 The University of Western Ontario. Psychological Interventions in Exercise, Sport, and Injury Rehabilitations

January – April 2010 The University of Western Ontario. Psychomotor Learning and Performance