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Validating the Children's Active Play Imagery Questionnaire

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VALIDATING THE CHILDREN'S ACTIVE PLAY IMAGERY QUESTIONNAIRE

by

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ABSTRACT

This study examined convergent and discriminant validity for the Children's Active Play Imagery Questionnaire (CAPIQ; Cooke et al., 2014), which assesses the frequency of one's imagery use for active play. In order to establish validity for the CAPIQ, four questionnaires were utilized including the Physical Activity Enjoyment Scale for Children (PACES for children; Moore et al., 2009), the Sport Imagery Questionnaire for Children (SIQ-C; Hall et al., 2009), the Sport Friendship Quality Scale (SFQS; Weiss & Smith, 1999), and the Competitive State Anxiety Inventory for Children (CSAI-2C; Stadulis et al., 2002). One hundred and ninety-four elementary school students (9-14 years of age) were recruited (n = 82 male; n = 111 female). Spearman correlation coefficients were calculated to determine relationships between the CAPIQ and the subscales of the PACES for children, SIQ-C, SFQS, and the CSAI-2C. Results provided support for both the convergent and discriminant validity of the CAPIQ.

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RESEARCH ARTICLE

Introduction

Imagery is a mental training tool that is widely utilized by both athletes (Munroe, Giacobbi, Hall, & Weinberg, 2000) and exercisers (Hausenblas, Hall, Rodgers, & Munroe, 1999). For example imagery use in physical activity has been found to enhance performance (Martin, Moritz, & Hall, 1999), improve concentration (White & Hardy, 1998), and increase self-efficacy (Munroe-Chandler, Hall, & Fishburne, 2008) and arousal regulation (Giacobbi, Hausenblas, Fallon, & Hall, 2003). Due to the expansive benefits of imagery use in physical activity (i.e., sport and exercise), preliminary research has been conducted on children's use of imagery during their leisure time physical activity, or active play (Tobin, Nadalin, Munroe-Chandler, & Hall, 2013), using the newly developed Children's Active Play Imagery Questionnaire (CAPIQ; Cooke, Munroe-Chandler, Hall, Tobin, & Guerrero, 2014). Yet, in order for research in this area to continue and evolve, it is important to further validate the CAPIQ. Questionnaire validation ensures researchers are accurately measuring the phenomenon of interest. Without validated measures, inventories may measure constructs they are not intending to measure thus providing inaccurate results. Active play is considered a major component of physical activity for children (Active Healthy Kids Canada [AHKC], 2014) and therefore understanding and measuring imagery as a strategy to increase active play is crucial for increasing children's levels of physical activity.

An often cited definition of imagery was advanced by White and Hardy (1998) in which they note:

> Imagery is an experience that mimics real experience. We can be aware of "seeing" an image, feeling movements as an image, experiencing an image

> of smell, tastes or sounds without actually experiencing the real thing… it differs from dreams in that we are awake and conscious when we form an image. (p. 389)

Paivio's (1985) analytic framework of imagery has been the foundation for much of the sport and, to a lesser extent, exercise imagery research. Paivio proposed that imagery has two functions, cognitive and motivational, that operate on general and specific levels. Cognitive specific (CS) includes images of developing or executing specific skills such as performing a volleyball serve or holding a tree pose in yoga, whereas cognitive general (CG) refers to images of strategies of play such as a serve and volley strategy in tennis or a step-aerobic routine. Motivational specific (MS) involves imaging specific goals such as winning an event or losing weight from running. Motivational general (MG) imagery refers to images relating to arousal levels and emotions such as imaging feeling relaxed prior to competition or invigorated after a spin class. Subsequent to Paivio's framework, researchers (Hall, Mack, Paivio, & Hausenblas, 1998) posited that imagery may be used for additional functions resulting in the MG function being further divided into motivational general-arousal (MG-A) and motivational general-mastery (MG-M). MG-A imagery refers to images related to arousal or stress and MG-M imagery refers to images of self-confidence and being mentally tough (Hall et al., 1998).

The interest in children's imagery use in a physical activity context began to evolve in the early 1990s with a review article on the psychological skill development with children and adolescents athletes (Weiss, 1991). In her article, Weiss (1991) suggested that imagery is an inherent skill for children, and is often used during the practicing and learning of sport skills. This suggestion follows classic psychology

research in which Piaget and Inhelder (1971) found that children between the ages of 8-12 years have the ability to construct transformational images and are able to alter the form and location of the images. By the age of 14 years, children are able to construct images similar to their adult counterparts (Piaget & Inhelder, 1971).

Research delving into youth athletes' use of imagery did not begin to flourish until the mid-2000s, after an in-depth qualitative study (Munroe-Chandler, Hall, Fishburne, & Strachan, 2007) and the subsequent development of the Sport Imagery Questionnaire for Children (SIQ-C; Hall, Munroe-Chandler, Fishburne, O, & Hall, 2009). Children's (ages 7-14 years) imagery use has been found to be related to increases in self-efficacy (O, Munroe-Chandler, Hall, & Hall, 2014), sport performance (Munroe-Chandler, Hall, Fishburne, Murphy, & Hall, 2012), collective efficacy (Munroe-Chandler & Hall, 2005), self-confidence (Munroe-Chandler et al., 2008), and anxiety control (Strachan & Munroe-Chandler, 2006). Similar to adult athletes, young athletes between the ages of 7-14 years report using imagery for both motivational and cognitive purposes (Hall et al., 2009).

Hall (1995) was the first to suggest that adult exercisers use imagery for motivation akin to athletes in sport. As a result of this recommendation, Hausenblas et al. (1999) explored this avenue through development of the Exercise Imagery Questionnaire (EIQ) for aerobic exercise. Over three quarters (75.7 %) of the 144 aerobic exercisers identified using imagery for cognitive and motivational purposes. Although children do not partake in structured exercise similar to their adult counterparts, they do participate in unstructured physical activity including active play. As such, researchers (Tobin et al.,

2013) began to examine whether imagery use could impact children's active play in much the same way it impacts youth sport and adult exercise.

Recent studies have shown that 93% of Canadian children are not meeting the daily recommended physical activity guidelines, which include 60 minutes of moderate to vigorous physical activity per day (AHKC, 2014). Children can accumulate their daily physical activity through either structured (e.g., organized sport) or unstructured (e.g., active play) physical activity (AHKC, 2014). Active play is defined as unstructured physical activity that takes place in a child's free time (Veitch, Salmon, & Ball, 2008). Examples of active play include playing freeze tag with friends, throwing a football around in the backyard, and climbing trees. Active play is an accessible and cost-effective way for children to meet the daily recommended physical activity guidelines.

Research has shown that active play has the capability to improve the physical, emotional, social, and cognitive aspects of a child's well-being (Burdette & Whitaker, 2005). Further, children may develop problem solving abilities during active play which stimulates executive functioning including attention, planning, organizing, sequencing, and decision making (Burdette & Whitaker, 2005). Active play can further minimize anxiety, depression, and aggression aiding in the improvement of a child's overall emotional well-being (Burdette & Whitaker, 2005).

A focus group study that contained 77 children (10-11 years of age) examined the factors that limited or facilitated active play activities, to better understand the reasons children participate in active play (Brockman, Jago, & Fox, 2011). The results indicated that freedom, socialising, prevention of boredom, and obtaining health benefits motivated children to engage in active play. Factors that were found to limit children's active play

included parental constraints and children's perceived constraints, whereas neighbourhood play spaces and technology (i.e., use of cell phones) facilitated children's active play. The methods of facilitating active play activities in children advanced by Brockman et al. (2011) will aid in the development of specific interventions aimed at increasing children's physical activity levels.

In the most recent report card on Canadian children's physical activity levels, active play was given an "incomplete" grade due to the limited research within this area (AHKC, 2014). Indeed, more research is needed due to the possible positive influence active play has on children's overall physical activity. Recently, Tobin et al. (2013) conducted a focus group study with 104 (male and female) children (7-14 years) with the purpose of exploring children's imagery use during active play. The results indicated that children utilize imagery during their active play activities and that these images were related to the Self Determination Theory's three basic psychological needs (Deci & Ryan, 2002). Within the need of autonomy, images included active play activities they participated in often or were their favourite. Within the need of relatedness, children's images related to participating in active play activities with friends and family. Finally, within the need of competence, images referred to children being successful during their active play activities (Tobin et al., 2013). These qualitative results led to the development of the CAPIQ and subsequent research examining the relationship between children's active play imagery and the three basic psychological needs.

Cooke et al. (2014) used a three phase approach to develop the CAPIQ, which included item development, content validity, and factorial validity. After establishing an operational definition of active play in the first phase, which reads unstructured physical

activity that takes place in a child's (7- 14 years) free time, an initial pool of 32 items were developed under three themes. Items were further minimized in accordance with previous active play research (e.g., Tobin et al., 2013) to 16 items. The three themes included capability imagery, fun imagery, and social imagery. Capability imagery refers to self-efficacy and competence, fun imagery includes enjoyment and interest, and social imagery includes peer's participation and encouragement from friends and family. Tobin et al.'s (2013) study results corresponded with the three themes of the CAPIQ outlined above. Assessment of item-content relevance was conducted by an expert panel not involved in the development of the CAPIQ. Aiken's (1985) item-content validity coefficient (V) was utilized in calculations to assess the significance of the expert panels rating for each item. Within Phase 1, an expert panel noted an issue with the capability items. In particular, they had concerns with comprehension (i.e., poor content relevance) and a lack of association between items within the capability subscale. Due to these concerns, all (four) original capability items were removed and replaced with newly developed items, and a stem was inserted of *"When thinking about active play"* to increase clarity. Utilizing feedback from the expert panel and statistical results, the preliminary version of the CAPIQ following Phase 1 was reduced to 12 items.

Phase 2 of the development of the CAPIQ focused on factorial validity of the 12 item measure with children ($N = 300$, 7-14 years). A principal component analysis (PCA) was conducted allowing variables to associate freely with one another and to identify underlying components. The PCA findings supported the retention of 11 items within the three subscales: capability imagery (four items), social imagery (four items), and fun imagery (three items; Cooke et al., 2014). Two of the three subscales of the CAPIQ had

adequate internal consistency, namely capability and social imagery (α's > 0.70), with the third subscale, fun imagery, approaching adequate internal consistency (α = 0.65; Cooke et al., 2014). The version of the CAPIQ following Phase 2 consisted of 11 items.

Within Phase 3 of development, a confirmatory factor analysis (CFA) was performed on the 11 item measure developed in Phase 2. The purpose of the CFA was to analyze the fit of the three factor model developed. The initial CFA resulted in acceptable fit with the comparative fit index (CFI) = 0.95, normative fit index (NFI) = 0.92, Tucker-Lewis Index (TLI) = 0.93, root-mean-square error of approximation (RMSEA) = 0.07, and standardised root-mean-square residual (SRMSR) = 0.06 (Cooke et al., 2014), which met or closely approached the cut-off values (Browne & Cudeck, 1993). An ANOVA was then conducted to examine the differences in active play imagery based on age and gender. Results noted no differences between the age cohorts (7-10, 11-14 years) and that both genders utilized fun imagery most often followed by social imagery then capability imagery. Further girls were shown to utilize capability imagery more than their male counterparts. The final CAPIQ (11 items) measures children's (7-14 years) use of imagery in active play on a 5-point Likert scale (1 = *not at all* to 5 = *very often*) with all the items including a stem of "*When thinking about active play.*" The CAPIQ includes three subscales: fun, capability, and social imagery.

A pilot physical activity intervention, using the recently developed CAPIQ as a measure of active play imagery use, was conducted with 17 female students between the ages of 9-10 years (Guerrero, 2013). Participants were randomly assigned to an imagery (automated imagery script) or control group (automated short story). Each group listened to an automated active play script or short story three times per week throughout the two

week study. Adequate internal consistencies were found for all of the CAPIQ subscales with alphas ranging from 0.73 - 0.90 (Guerrero, 2013). The participants in the imagery group reported higher frequency of imagery use on all three imagery subscales (i.e., capability, fun, social) when compared to the control group. Although the imagery group did not show a significant increase in imagery use scores from pre- to post-intervention, Guerrero (2013) suggested this may have been due to methodological issues within the study (i.e., length of intervention, nature of pilot study).

The relationship between children's active play imagery (fun, social, capability imagery) and the three basic psychological needs (autonomy, competence, relatedness) was recently undertaken by Tobin et al. (2015). Participants (N = 253, ages 7-14) completed the CAPIQ (Cooke et al., 2014) and the Basic Needs Questionnaire for Children (BNQ-C; Gray, Prapavessis, & McGowan, 2009). Capability imagery and fun imagery were both found to be positively related to the need for competence. Further, social imagery was shown to be positively related to the need for relatedness. These findings highlight the potential for imagery use to motivate children's active play activities and ultimately increase physical activity participation in children.

Due to the recent development of the CAPIQ, Cooke et al. (2014) suggested the psychometric properties should be further validated using convergent validity. This would confirm that the constructs of the CAPIQ are theoretically related to other constructs utilized with children. Construct validity, which involves the measurement of the operationalized concepts of inventories and includes both convergent and discriminant validity (Trochim, 2006) was not established during the initial development of the CAPIQ. Further development through convergent validity, which assesses the

factors within a questionnaire and the degree of similarity to factors they should be theoretically similar to (Trochim, 2006) is warranted. As convergent validity and discriminant validity both provide evidence for construct validity, discriminant validity will also be assessed. Discriminant validity measures the degree to which concepts that should not be theoretically related to one another are found to be unrelated (Trochim, 2006).

Hypotheses for Current Study

The purpose of this study was to establish convergent and discriminant validity of the CAPIQ (see Table 1). In order to do so, four inventories developed for use with children were utilized that included the SIQ-C (Hall et al., 2009), the Physical Activity Enjoyment Scale for Children (PACES for children; Moore et al., 2009), the self -esteem enhancement and supportiveness (e.g., friend's support) and companionship and pleasant play subscales of the Sport Friendship Quality Scale (SFQS; Weiss & Smith, 1999), and the Competitive State Anxiety Inventory for Children (CSAI-2C; Stadulis, MacCracken, Eidson, & Severance, 2002).

The SIQ-C was used to establish convergent validity for the CAPIQ. The MG-M subscale of the SIQ-C has been associated with confidence (e.g., Munroe-Chandler et al., 2008) and efficacy (e.g., O et al., 2014) and therefore should strongly correlate with the capability subscale of the CAPIQ. The content of the remaining subscales of the SIQ-C all refer to one's use of imagery, as does the CAPIQ, and therefore are expected to correlate with the fun and capability subscales of the CAPIQ (providing further evidence for convergent validity). More specifically, both CS and CG imagery relate to imaging

specific skills and strategies (Munroe-Chandler et al., 2007), constructs which are theoretically similar to the capability imagery subscale of the CAPIQ.

The CSAI- 2C will be utilized to establish convergent validity through the confidence subscale, which is expected to positively correlate with the capability subscale from the CAPIQ. These subscales are expected to correlate as children's imagery use has been shown to increase confidence (O et al., 2014) and efficacy (Munroe-Chandler & Hall, 2005) in children. Further, the cognitive and somatic anxiety subscales of the CSAI-2C are not expected to positively correlate with any subscales of the CAPIQ providing evidence of discriminant validity.

The PACES for children is expected to positively correlate with the fun subscale of the CAPIQ providing support for convergent validity. PACES for children measures children's enjoyment during physical activity, of which active play is a component. Children have been shown to image most for fun (Tobin et al., 2013) therefore, the PACES for children should strongly correlate with the fun subscale of the CAPIQ.

Finally, two of six subscales of the SFQS were utilized for convergent validity as they were believed to be theoretically linked to active play imagery. Both self-esteem enhancement and supportiveness (i.e., friend's support) and companionship and pleasant play (i.e., getting along well with friends) from the SFQS are expected to positively correlate with the social subscale of the CAPIQ. The SFQS is related to the relationship between a child and their closest relationship within sport. Further, children report images involving friends and family during their active play (Tobin et al., 2013), which is theoretically similar to the two aforementioned subscales of the SFQS.

Method

Participants

Based on the measurement being used in the data analysis of Spearman's correlation coefficient, a minimum sample size of 140 children was determined. Researchers have noted that within the social sciences to obtain a reliability coefficient of approximately 0.80, 10 cases should be utilized for each variable (Tabachnick & Fidell, 2007). Within the five questionnaires that were administered to participants there were a total of 14 variables thus requiring a minimum of 140 participants.

Although a total of 212 participants completed the questionnaire package, participants who did not have any organized sport experience were removed due to the nature of two of the questionnaires (i.e., SIQ-C and SFQS). Therefore, the participants included a total of 194 elementary school students (82 boys and 111 girls) between the ages of 9-14 years (which included grades 4-8; $M = 10.87$, $SD = 1.36$) who had or were participating in organized sport. Children in this age range were recruited due to the reading level of the questionnaires used. Flesch-Kincaid readability grade levels were calculated for all the questionnaires (2.1- 4.6). Children were recruited from five elementary schools within Windsor-Essex County, Ontario. Parents' average income from the participating schools ranged from $48,300 - $96,400 per year as of 2013 (Cowley & Easton, 2013). The schools' academic performance ratings out of ten ranged from 2.5 – 7.0 (Cowley & Easton, 2013).

Measures

Demographics. All participants completed demographic questions which assessed age, gender, elementary school, grade, and if they participated in organized

sport. If they did participate in organized sport, they were asked to indicate which sport (see Appendix A).

Active play imagery. The CAPIQ (Cooke et al., 2014) assesses children's use of imagery during active play. The CAPIQ (see Appendix B) is an 11 item self-report questionnaire consisting of three subscales: fun imagery (three items), social imagery (four items), and capability imagery (four items) measured on a 5-point Likert scale (1 = *not at all* to 5 = *very often*). Each item contains the stem of "*When thinking about active play*" to secure an association to the context of active play. A sample item from the capability imagery subscale reads, "*I imagine the moves that are needed*." A sample item from the social imagery subscale reads, *"I imagine joining in with others."* A sample item from the fun imagery subscale reads, *"I picture myself having fun."* Previous research has demonstrated adequate internal consistency with alpha coefficients between 0.73- 0.82 for each of the three subscales (Cooke et al., 2014).

Sport imagery. The SIQ-C (Hall et al., 2009) is a self-report inventory assessing children's frequency of imagery use in sport. The SIQ-C (see Appendix C) includes 21 items measured on five subscales: MS, MG-M, MG-A, CS, and CG. Each item is measured on a 5-point Likert scale (1= *not at all* to 5 = *very often*). A sample item from the MS subscale reads, *"I see myself doing my very best."* A sample item from the MG-M subscale reads, *"I imagine myself being confident in competition."* A sample item from the MG-A subscale reads, *"In my head, I imagine how calm I feel before I compete."* A sample item from the CS subscale reads, *"I can usually control how a skill looks in my head."* A sample item from the CG subscale reads, *"I make up new game plans or routines in my head."* Previous studies have demonstrated adequate internal

consistencies (e.g., Hall et al., 2009) ranging from 0.69-0.82, and adequate fit indices (CFI= 0.89, RMSEA= 0.7) from a CFA assessing the fit for the five factor model (Hall et al., 2009).

Enjoyment of physical activity. The PACES for children (Moore et al., 2009) is a self-report questionnaire which assesses the enjoyment of physical activity for children (see Appendix D). The PACES for children includes 16 items and is a unidimensional inventory measured on a 5-point Likert scale (1= *disagree a lot* to 5= *agree a lot*). Each item includes a stem of *"When I am physically active" and* a sample item reads, "*I enjoy it*." A CFA supported the unidimensional structure of PACES for children (CFI= 0.99 and non-normed fit index NNFI= 0.98) and good internal consistency was established (α = 0.87; Moore et al., 2009).

Sport friendship. The SFQS (Weiss & Smith, 1999) assesses friendship quality within the sport domain in reference to the child's relationship with their closest friend. The SFQS (see Appendix E) is a six factor 22 item self-report inventory measured on a 5-point Likert scale (1= *not at all true* to 5= *really true*). The six factors within the SFQS include: self-esteem enhancement and supportiveness (four items), loyalty and intimacy (four items), things in common (four items), companionship and pleasant play (four items), conflict resolution (three items), and conflict (three items). For the current study, two of the six subscales were utilized for convergent validity with the CAPIQ self-esteem enhancement and supportiveness (i.e., friend's support), and companionship and pleasant play (i.e., getting along well with friends). A sample item from the self-esteem enhancement and supportiveness subscale reads, "*My friend gives me a second chance to perform a skill*." A sample item from the companionship and pleasant play subscale

reads, *"My friend and I do fun things."* Adequate internal consistencies have been reported for both subscales: self-esteem enhancement and supportiveness (α = 0.77) and companionship and pleasant play (α = 0.76) (Weiss & Smith, 1999). Further, a CFA conducted on the 22 item six factor model resulted in adequate fit CFI= 0.94, NNFI = 0.93, and RMSEA = 0.56 (Weiss & Smith, 1999).

Competitive anxiety. The CSAI-2C (Stadulis et al., 2002; see Appendix F) assesses children's state anxiety in sport. It is a 15 item self-report inventory measuring three subscales of cognitive anxiety (worry), somatic anxiety (physical), and confidence (degree of certainty). During its initial development the CSAI-2C was modified for use with play and it was that version that was utilized within this study (Stadulis et al., 2002). Items are ranked on a 4-point Likert scale from (1= *not at all* to 4= *very much so*). A sample item from the somatic anxiety subscale reads, "*My body feels tense*." A sample item from the confidence subscale reads, *"I feel self-confident."* A sample item from the cognitive anxiety subscale reads, *"I am concerned I will not play as well as I can today."* Previous research has demonstrated adequate internal consistencies for all subscales: somatic anxiety (α = 0.78), confidence (α = 0.73), and cognitive anxiety (α = 0.75) (Stadulis et al., 2002). Further, a CFA provided support for the three factor model through the GFI (0.96), Adjusted Goodness of Fit Index (AGFI= 0.94), and RMSR= 0.04 (Stadulis et al., 2002).

Procedure

Ethics approval was first obtained from the University of Windsor's Research Ethics Board followed by the approval from the superintendent (see Appendix G) from a school board in Windsor-Essex County. Recruitment emails were sent out to 36 school

principals (see Appendix H). Email responses were received from five schools indicating they were interested in participating thus resulting in a 13.88% response rate. The principals from the interested schools were then met in person by the lead researcher to obtain permission to enter the grades four through six classrooms. Once permission was granted, the lead researcher entered the classrooms and provided a brief overview of the research study and distributed an information package containing a letter of information (see Appendix I), parental consent form (see Appendix J), participant assent form (see Appendix K), and a parent recruitment script to all students (see Appendix L). Upon the return of parental consent forms and participant assent forms to teachers, the lead researcher returned to the schools to distribute the questionnaire package to the eligible participants (children between the ages of 9-14 with parental consent). A total of 1167 consent form packages were handed out to students across all five elementary schools. Overall, 212 consent forms were returned to researchers representing a response rate of 18.16%.

The questionnaire package was randomized for each school and re-assent forms (see Appendix M) were completed immediately prior to the completion of the questionnaires. The questionnaire package, which included a demographic questionnaire was distributed in a designated area during the students' school day. This was coordinated by the individual teachers and principals to ensure minimal disruption to the students' classes. The questionnaire package took students approximately 20 minutes to complete, which included a short break during questionnaire completion.

Data Analysis

Prior to conducting the main analysis, all the data were analyzed for data entry accuracy, missing values, and outliers (Tabachnick & Fidell, 2007). Alpha coefficients were analyzed for reliability for the measurement subscales and descriptive statistics (i.e., means and standard deviations) were then calculated. Convergent and discriminant validity were assessed using the Spearman's correlation coefficient to determine the strength of the relationships between active play imagery and sport friendship, play anxiety, confidence, enjoyment, and sport imagery use. Spearman correlation coefficient was utilized as the assumption of normality for Pearson product moment correlation was violated. Interpretation of correlation magnitude were analyzed using values established by Brace, Kemp, and Snelgar (2006; weak ≤ .2, moderate = .3 - .6, strong ≥ .7).

Results

Data Screening

A missing data analysis was conducted in order to determine the amount of missing data as well as the pattern of the missing data. Results revealed that there was less than 1% of data missing and that values were missing completely at random (Fox-Wasylyshyn & El-Masri, 2005). Due to the small amount of missing data, all missing values were replaced using case mean substitution (Fox-Wasylyshyn & El-Masri, 2005; Tabachnick & Fidell, 2007). The assumptions of the Pearson product moment correlation (i.e., normality assumptions) were then examined.

The assumptions of normality were examined using the Kolmogorov-Smirnov test and the Shapiro-Wilk test, wherein a *p*-value less than or equal to .05 indicates a non-normal distribution (Field, 2013). The results showed that all variables were non-normally distributed. Outliers were then examined and removed in an effort to improve

the data. Removal of the outliers improved the data but all of the variables were still non-normally distributed. Given the variables still violated the normality assumption, transformations were implemented in another attempt to meet this assumption. Both square root and logarithmic transformations were applied to the non-normally distributed variables; however, neither transformation improved the data. Consequently, it was deemed appropriate to examine the data using the non-parametric equivalent of the Pearson product moment correlation, the Spearman's correlation coefficient. Spearman's correlation coefficient includes fewer restrictions on the data (i.e., assumption of normality; Field, 2013).

Descriptive Statistics

All subscales were examined for internal consistency using alpha coefficients (see Table 2). The Cronbach alphas indicated that 10 subscales achieved an acceptable minimum reliability of .70 (Nunnally & Bernstein, 1994), with the remaining four subscales ranging from .61- .69. Devellis (1991) suggested that although alpha values below .60 are unacceptable, it is not uncommon to see alphas within the .60- .69 range for published scales. Further research has indicated that alphas greater than .60 have been suggested to be acceptable for factors comprising fewer than 10 items (Loewenthal, 1996). As the remaining four subscales all included less than 10 items the alpha coefficients were deemed acceptable. The means and standard deviations were calculated for all 14 subscales and are also presented in Table 2. The highest mean was found for the fun imagery subscale from the CAPIQ, followed by social and capability imagery.

Convergent and Discriminant Validity

The Spearman's correlation coefficients between the subscales of the CAPIQ and the subscales of the SIQ-C, CSAI-2C, SFQS and PACES for children are reported in Table 3. The results revealed that MG-M imagery (from the SIQ-C) was moderately positively correlated with capability imagery (r_s = .47, p < .01; Brace et al., 2006), which was consistent with the hypothesis. All other subscales from the SIQ-C had small to moderate correlations (r_s = .19 - .44, p < .01) with the imagery subscales of the CAPIQ (social, fun, capability) supporting the hypotheses for the SIQ-C. A moderate positive correlation was found between the confidence subscale of the CSAI-2C and fun imagery of the CAPIQ (r_s = .36, p < .01), which was contrary to the hypothesis. A weaker moderate positive correlation was found between the confidence subscale and capability imagery (r_s = .30, p < .01), which provided partial support for the hypothesis. The cognitive anxiety subscale had a weak negative correlation with the fun and social imagery subscales from the CAPIQ (r_s = -.14; -.17, p < .05). The remaining correlations between cognitive anxiety and somatic anxiety and the subscales of the CAPIQ were not significant (ps > .05) providing support for the hypotheses. Further, a moderate positive correlation was found between the PACES for children and the fun imagery subscale of the CAPIQ (r_s = .40, p < .01), which supported the hypothesis. Finally, the self-esteem enhancement and supportiveness and companionship and pleasant play subscales from the SFQS had weak to moderate positive correlations with all subscales from the CAPIQ including social imagery, which supported the hypotheses (r_s = .17 - .18, p < .05; r_s = .25 - .34, ps < .01).

Discussion

The overall purpose of this study was to examine the convergent and discriminant validity of the CAPIQ. During the development of the CAPIQ (Cooke et al., 2014), both content and factorial validity were established in a large independent sample. Following previous studies that have assessed convergent and discriminant validity (i.e., Hall et al., 2009; Martin, Carron, Eys, & Loughead, 2013) and as suggested by Mayers (2013), the association between the CAPIQ subscales and the subscales of the SIQ-C, CSAI-2C, PACES for children, and SFQS (i.e., self-esteem enhancement and supportiveness and companionship and pleasant play) were examined. The mean scores for all subscales of the CAPIQ were high (ranging from 3.33 – 4.21 out of 5), suggesting children within this study frequently used imagery during their active play activities. This finding supports previous research studies with similarly aged children (e.g., Cooke et al., 2014). The fun imagery subscale was found to have the highest mean score ($M = 4.21$) of the CAPIQ subscales, which also supports previous active play imagery research (e.g., Cooke et al., 2014; Tobin et al., 2013). The high reported use of fun imagery is not surprising given that fun is a primary reason for why children participate in physical activity (Allender, Cowburn, & Foster, 2006; Gould, Feltz, & Weiss 1985). Further, research noted one of the common characteristics of active play behaviours is that they are pleasurable (Garvey, 1990). Taken together, it is important future active play imagery research not underestimate the influence of fun on children's physical activity.

In the current study, it was hypothesized that the five subscales from the SIQ-C (i.e., CS, CG, MS, MG-M, MG-A) would be positively correlated with the fun and capability subscales of the CAPIQ, thereby providing evidence for convergent validity. This hypothesis was made because the basic underlying component of both

questionnaires is children's imagery use in a physical activity context. More specifically, it was hypothesized that MG-M imagery would correlate most strongly with capability imagery of the CAPIQ, in comparison to the remaining subscales of the SIQ-C. A significant moderate correlation was found between MG-M imagery and capability imagery thus supporting the hypothesis. Previous sport imagery research has found an association between MG-M imagery and efficacy (e.g., O et al., 2014), and MGM-imagery and confidence (e.g., Munroe- Chandler et al., 2008) in young athletes thus providing additional support for the current positive moderate correlation. Previous research has also found that self-efficacy has been regarded as one of the most reliable predictors of physical activity (Weinberg & Gould, 2011). Further, research has shown that children with higher self-efficacy are more likely to participate in physical activity than children with lower self-efficacy (Chase, 2001). Collectively, these findings are important as children's use of capability imagery may enable active play adherence. More specifically, an intervention targeting capability imagery may help facilitate an increase in children's physical activity (active play) participation and adherence.

Positive weak to moderate correlations were also found with the remaining subscales of the SIQ-C (i.e., CS, CG, MS, MG-A) and the subscales of the CAPIQ. Again, this was expected given the conceptual link between active play imagery use and sport imagery use. Of note, the moderate positive correlation found between CG imagery and capability may be due to the fact that items from the CG subscale reflect images of strategies or routines, which are similar in content to the items from the capability subscale. This can be highlighted in an example item from the capability imagery subscale which reads, *"When thinking about active play, I imagine the movements that*

my body makes." The correlation between capability imagery and CG imagery suggests that imaging strategies or game plans in sport can be related to imagining oneself feeling capable during one's active play activities. Previous research has found that children who were motor competent were more physically active in a variety of physical activity settings (Castelli & Valley, 2007). As such, it is possible that an increase in capability imagery may facilitate motor competence during children's active play activities thus resulting in greater adherence to active play and an overall increase in children's physical activity. It is important to note that the mean scores of both the CAPIQ and SIQ-C provide support for the use of imagery while participating in active play (Cooke et al., 2014) and organized sport (both motivational and cognitive imagery; Hall et al., 2009).

It was hypothesized that the confidence subscale of the CSAI-2C would be positively correlated with capability imagery from the CAPIQ, thus providing additional evidence for convergent validity. A significant positive moderate correlation was found, which provides partial support for the hypothesis. A stronger positive moderate correlation was found between confidence and fun imagery rather than capability imagery as was expected. Research by Tobin et al. (2013) may help to explain this finding. They noted that children who imagined themselves having fun during active play were more likely to feel capable of successfully performing their active play activities. Further, fun has been noted as the most prominent reason for children's participation in physical activity (Gould et al., 1985), thus suggesting that it is possible children who image fun active play activities may increase their motivation to become physically active.

An explanation as to why capability imagery was not as strongly correlated with confidence may be due to the sample. Given that all the children in the current study indicated participating in an organized sport, it is possible they already had a high perceived competence for physical activity. This is supported by previous research which suggests that children who are highly motivated to participate in physical activity are also characterized as having a high perceived competence (Wang, Chatzisarantis, Spray, & Biddle, 2002). Previous research also noted that children who are more inexperienced in physical activity may have a greater need for employing capability imagery (Cooke et al., 2014). Taken together, it is possible the current sample did not have a high need for employing capability imagery (and this is also reflected in capability imagery having the lowest mean score of all active play imagery subscales) and may have focused more on fun imagery. These findings highlight an important relationship between confidence and both fun and capability imagery use in active play.

For the remaining subscales from the CSAI-2C, it was posited that both cognitive and somatic anxiety would not positively correlate with any of the subscales of the CAPIQ (providing evidence for discriminant validity). Indeed this was the case as no significant positive correlations between cognitive and somatic anxiety and the CAPIQ subscales were found. Due to the lack of significant correlations, it can be suggested that cognitive and somatic anxiety may be low when children imagine themselves being capable, social, and having fun in their active play. Overall, the results from the correlations between the CSAI-2C and the CAPIQ establish evidence for both convergent and discriminant validity.

To further establish evidence for convergent validity, it was hypothesized that the PACES for children and fun imagery of the CAPIQ would be positively correlated. Given the PACES for children measures children's enjoyment during physical activity, and active play is freely chosen (Laaksonen et al., 2002) and fun for the child (Garvey, 1990), it was expected these two subscales (PACES and fun) would be correlated. Indeed, the PACES for children and the fun imagery subscale of the CAPIQ were moderately correlated, thus providing further evidence for convergent validity for the CAPIQ. Moreover, children reported using fun imagery most during their active play, which supports the findings from previous active play studies (Cooke et al., 2014; Tobin et al., 2013). By targeting and thus increasing fun imagery use with children, it may facilitate an increase in the children's enjoyment during active play. Given that fun is one of the main reasons children participate in physical activity (Gould et al., 1985), children's use of fun imagery could aid in increasing their overall physical activity participation.

In regards to the SFQS, it was hypothesized that two subscales, self-esteem enhancement and supportiveness and companionship and pleasant play, would correlate positively with the social subscale of the CAPIQ thus providing evidence for convergent validity. A significant moderate positive correlation was found between self-esteem enhancement and supportiveness and social imagery. Given the social imagery subscale relates to imaging oneself engaging in active play with friends and family (Cooke et al., 2014), and the self-esteem enhancement and supportiveness subscale relates to the support received from one's sport friend (Weiss & Smith, 1999), the two are theoretically similar and therefore it is not surprising they were correlated. A weak significant positive correlation was found between the companionship and pleasant play subscale and the

social subscale from the CAPIQ however, the strongest correlation was found between the companionship and pleasant play subscale of the SFQS and the fun imagery subscale of the CAPIQ. Previous research conducted with a young sample (7-14 years) found that children often reported imaging themselves alone while performing their active play activities (Tobin et al., 2013). As a result, they did not frequently imagine themselves socializing in an active play setting nevertheless, they were still imaging themselves having fun. This could help to explain the stronger correlation found between the companionship and pleasant play subscale of the SFQS and the fun imagery subscale than the social imagery subscale. The results from the current study also show a weak positive relationship between companionship and pleasant play and social imagery, thus indicating the importance of friendship and friend's support to a child's self-esteem. As such, interventions aimed at increasing the use of social imagery may provide another avenue of enhancing children's self-esteem in an active play context. These results provide additional support for the establishment of convergent validity for the CAPIQ and further highlight the importance of fun for children participating in active play (through the positive relationship found between companionship and pleasant play and fun imagery).

This study was not without limitations. One such limitation was that although the questionnaires were previously utilized with children (nine years of age or younger), it is possible there were some difficulties in comprehension. Two researchers were present to provide guidance for the children during questionnaire completion, as past research utilizing self-report questionnaires with children recommended a researcher's presence during completion (i.e., Cooke et al., 2014; Moore et al., 2009). In addition, the children

were informed to ask questions if they did not understand a word or statement. Despite these safeguards, which were in line with recommendations suggesting researchers should be present during questionnaire completion and provide instructions to children and youth prior to completion (Fargas-Malet, McSherry, Larkin, & Robinson, 2010), it is important to ensure children have an adequate understanding of the items. It may be necessary that when working with young children, the researcher read aloud each question and corresponding answer thus mitigating any possible barriers related to questionnaire completion (e.g., reading ability).

Additionally, the number of questions that students were asked to complete was extensive for students in grades 4-6 (i.e., 72 questions). It was anticipated that children would fatigue before questionnaire completion and therefore a short break was given midway through each session. Research with children has noted the importance of short breaks in order to keep the children engaged and focused (e.g., Goodenough, Williamson, Kent, & Ashcroft, 2003; Morgan, Gibbs, Maxwell, & Britten, 2002). It is important for future researchers working with children to be conscientious of the number of items requiring completion and that items be kept to a minimum (Borgers, de Leeuw, & Hox, 2000). It is also important to have the fewest possible questions while still having reliable questionnaires for children within the age range of (7-14 years; Hall et al., 2009; Stadulis et al., 2002). In the present study, we randomized questionnaires thus attempting to alleviate the negative effects of a lengthy questionnaire by keeping missing or incomplete data from occurring within the same questionnaire throughout data collection.

Further, as the CAPIQ draws on children's experiences from active play, one important limitation of this study is the time of year during which the study was

completed. During the warmer months (i.e., the summer), it has been noted that children participate more in physical activity sessions (active play; Belanger, Gray-Donald, O'Loughlin, Paradis, & Hanley, 2009). If the current study had taken place during the spring or summer months, children may have had more recent experiences to draw upon, possibly leading to different results. This study took place during the winter months of January and February. Attributable to the weather and temperature outside, many students may have had less active play experiences upon which to draw. Research has shown children participate in less physical activity (including active play) during the winter in comparison to the spring and summer months (Beighle, Alderman, Morgan, & Le Masurier, 2008). However, due to the time constraints of the project, the time of year was unavoidable. Future studies should take the time of year into consideration when planning and executing studies on children's active play experiences.

For active play imagery research to thrive and evolve, it is important to have a validated measure which will help guarantee the results provided are accurate. Taken together, the findings from this study provide new evidence as well as confirmation of the psychometric properties for the CAPIQ further ensuring its validity. Additionally, a valid and reliable inventory will allow for future research to be conducted within the active play imagery domain. As there has currently been a decline in children's physical activity (AHKC, 2014), it is important to identify strategies of motivating children to become more physically active (including engaging in active play). Imagery has been found to help motivate adult exercisers to participate in more physical activity (Hall, 1995), and as such imagery may be one such strategy to help children engage in more active play. The recent report card on children's physical activity (AHKC, 2014) also recommended

further research in the active play domain due to the incomplete grade awarded for active play. The validation of the CAPIQ will allow for continued active play imagery research and ultimately lead to the development of an evidence-based benchmark on which children can be compared thus allowing for the ability of awarding of a grade for the report card. This would increase the knowledge of children's active play levels and lead to a better understanding of children's overall physical activity levels.

Additionally, increasing research within the active play imagery domain may increase knowledge of relationships it may have with other constructs (e.g., self-efficacy, self-confidence). Imagery provides an active means for altering individuals' behaviours, thoughts and/or beliefs (Hall, 2001). By identifying the relationships of imagery with active play, future interventions designed to improve physical activity levels among children and youth can be established. The previous establishment of a reliable questionnaire for imagery use in youth sport (i.e., SIQ-C; Hall et al., 2009) allowed for imagery research with young athletes to flourish. Children's imagery use in sport has been shown to have many positive benefits including increased self-efficacy (O et al., 2014), sport performance (Munroe-Chandler et al., 2012), collective efficacy (Munroe-Chandler & Hall, 2005), self-confidence (Munroe-Chandler et al., 2008), and anxiety control (Strachan & Munroe-Chandler, 2006). The establishment of convergent and discriminant validity for the CAPIQ will allow future studies to utilize a valid and reliable questionnaire when examining similar relationships or benefits with children in an active play context.

References

Active Healthy Kids Canada (AHKC; 2014). Is Canada in the running? How Canada stacks up against 14 other countries on physical activity for children and youth. *The Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth.* Toronto, ON.

Aiken, L. R. (1985). Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement, 45*, 131–142.

Allender, S., Cowburn, G., & Foster, C. (2006). Understanding participation in sport and physical activity among children and adults: A review of qualitative studies. *Health Education Research: Theory & Practice, 21*(6), 826-835.

Beighle, A., Alderman, B., Morgan, C. F., & Le Masurier, G. (2008). Seasonality in children's pedometer-measured physical activity levels. *Research Quarterly for Exercise and Sport, 79*(2), 256-260.

Belanger, M., Gray-Donald, K., O'Loughlin, J., Paradis, G., & Hanley, J. (2009). Influences of weather conditions and seasons on physical activity in adolescents. *Annals of Epidemiology, 19*(3), 180-186.

Borgers, N., de Leeuw, E., & Hox, J. (2000). Children as respondents in survey research: Cognitive development and response quality. *Bulletin de Methodologie Sociologique, 66*, 60-75.

Brace, N., Kemp, R., & Snelgar, R. (2006). *SPSS for psychologists: A guide to data analysis using SPSS for windows* (3rd ed.). London: Routledge.

Brockman, R., Jago, R., & Fox, K. R. (2011). Children's active play: Self- reported motivators, barriers, and facilitators. *BMC Public Health, 11*, 461.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136- 162). Newbury Park, CA: Sage.

Burdette, H., & Whitaker, R. (2005). Resurrecting free play in young children. *Archives of Paediatric and Adolescent Medicine, 159,* 46-50. doi: 10.1001/archpedi.159.1.46

Castelli, D. M., & Valley, J. A. (2007). Chapter 3: The relationship of physical fitness and motor competence to physical activity. *Journal of Teaching in Physical Education, 26*, 358- 374.

Chase, M.A. (2001). Children's self-efficacy, motivational intentions, and attributions in physical education and sport. *Research Quarterly for Exercise and Sport, 72,* 47-61.

Cooke, L., 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, 32*(9), 860-869. doi.org/10.1080/02640414.2013.865250

Cowley, P., & Easton, S. (2013). Report card on Ontario's elementary schools 2013. *Fraser Institute Studies in Education Policy,* 1-236.

Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research.* Rochester, NY: University of Rochester.

Devellis, R. F. (1991). *Scale development: Theory and applications.* Newbury Park: Sage Publications.

Fargas-Malet, M., McSherry, D., Larkin, E., & Robinson, C. (2010). Research with children: Methodological issues and innovative techniques. *Journal of Early Childhood Research, 8*, 175-192. doi: 10.1177/1476718X09345412

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Thousand Oaks, California; SAGE.

Fox-Wasylyshyn, S. M., & El-Masri, M. M. (2005). Focus on research methods: Handling missing data in self-report measures. *Research in Nursing & Health, 28,* 488 – 495. doi: 10.1002/nur.20100

Garvey, C. (1990). *Play Cambridge*. MA: Harvard University Press.

Giacobbi, P. R., Jr., Hausenblas, H. A., Fallon, E. A., & Hall, C. R. (2003). Even more about exercise imagery: A grounded theory of exercise imagery. *Journal of Applied Sport Psychology, 15,* 160-175.

Goodenough, T., Williamson, E., Kent, J. & Ashcroft, R. (2003). '"What did you think about that?" Researching children's perceptions of participation in a longitudinal genetic epidemiological study'. *Children and Society 17,* 113–25.

Gould, D., Feltz, D., & Weiss, M. (1985). Motives for participating in competitive youth swimming. *International Journal of Sport Psychology, 16*, 126 - 140.

Gray, C., Prapavessis, H., & McGowan, E. (June, 2009). *Self-efficacy and basic psychological needs instrument validation*. Paper presented to the International Society for Behavioral Nutrition and Physical Activity, Lisbon, Portugal.

Guerrero, M. D. (2013). *Effects of a guided imagery intervention on children's active play: A pilot study* (Master's Thesis). University of Windsor, Windsor, ON.

Hall, C. R. (1995). The motivational function of mental imagery for participation in sport and exercise. In J. Annett, B. Cripps, & H. Steinberg (Eds.), *Exercise addiction: Motivation for participation in sport and exercise* (pp. 17-23). Leicester, UK: British Psychology Society.

Hall, C. R. (2001). Imagery in sport and exercise. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of sport psychology* (2nd ed., pp. 529–549). New York, NY: John Wiley & Sons.

Hall, C. R., Mack, D. E., Paivio, A., & Hausenblas, H. A. (1998). Imagery use by athletes: Development of the Sport Imagery Questionnaire. *International Journal of Sport Psychology, 29,* 73- 79.

Hall, C. R., Munroe-Chandler, K. J., Fishburne, G. O., O. J, & Hall, N. D. (2009). The Sport Imagery Questionnaire for Children. *Measurement in Physical Education and Exercise, 13,* 93-107.

Hausenblas, H. A., Hall, C. R., Rodgers, W. M., & Munroe, K. J. (1999). Exercise imagery: Its nature and measurement. *Journal of Applied Sport Psychology, 11,* 171-180.

Laaksonen, D. E., Niskanen, L. K., Lakka, H. M., Rauramaa, R., Salonen, J. T., & Lakka, T. A. (2002). Low levels of physical activity and cardiorespiratory fitness predict development of the metabolic syndrome. *Diabetes Care, 25*, 1612-1618. doi.org/10.2337/diacare.25.9.1612.

Loewenthal, K. M. (1996). *An introduction to psychological tests and scales.* London, UK: UCL Press.

Martin, L. J., Carron, A. V., Eys, M. A., & Loughead, T. (2013). Validation of the Child Sport Cohesion Questionnaire. *Measurement in Physical Education and Exercise Science, 17*, 105- 119.

Martin, K. A., Moritz, S. E., & Hall, C. R. (1999). Imagery use in sport. A literature review and applied model. *The Sport Psychologist, 13,* 245-268.

Mayers, A. (2013). *Introduction to statistics and SPSS in psychology.* Edinburgh, UK: Pearson Education Limited.

Moore, J. B., Yin, Z., Hanes, J., Duda, J., Gutin, B., & Barbeau, P. (2009). Measuring enjoyment of physical activity in children: Validation of the Physical Activity Enjoyment Scale. *Journal of Applied Sport Psychology, 21*(1), S116- S129.

Morgan, M., Gibbs, S., Maxwell, K., & Britten, N. (2002). 'Hearing children's voices: Methodological issues in conducting focus groups with children aged 7–11 years'. *Qualitative Research 2*(5), 5–20.

Munroe, K. J., Giacobbi, P. R., Jr., Hall, C. R., & Weinberg, R. (2000). The four W's of imagery use: Where, when, why, and what. *The Sport Psychologist, 14,* 119-137.

Munroe-Chandler, K. J., & Hall, C. R. (2005). Enhancing the collective efficacy of a soccer team through motivational general-mastery imagery. *Imagination, Cognition, and Personality, 24*(1), 51- 67.

Munroe-Chandler, K. J., Hall, C. R., & Fishburne, G. J. (2008). Playing with confidence: The relationship between imagery use and self-confidence and self-efficacy in youth soccer players. *Journal of Sport Sciences, 26,* 1539- 1546.

Munroe-Chandler, K. J., Hall, C. R., Fishburne, G. J., Murphy, L., & Hall, N. D. (2012). Effects of a cognitive specific imagery intervention on the soccer skill

performance of young athletes: Age group comparisons. *Psychology of Sport and Exercise, 13,* 324-331. doi:10.1016/j.psychsport.2011.12.006

Munroe-Chandler, K. J., Hall, C. R., Fishburne, G. J., & Strachan, L. (2007). Where, when, and why young athletes use imagery: An examination of developmental differences. *Research Quarterly for Exercise and Sport, 78,* 103-116.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw–Hill.

O, J., Munroe-Chandler, K. J., Hall, C. R., & Hall, N. D. (2014). Using motivational general-mastery to improve the self-efficacy of youth squash players. *Journal of Applied Sport Psychology, 26*(1), 66-81. doi: 10.1080/10413200.2013.778914

Paivio, A. (1985). Cognitive and motivational functions of imagery in human performance. *Canadian Journal of Applied Sport Science, 10,* 22s- 28s.

Piaget, J., & Inhelder, B. (1971). *Mental imagery in the child.* New York, NY: Basic Books.

Stadulis, R. E., MacCracken, M. J., Eidson, T. A., & Severance, C. (2002). A children's form of the Competitive State Anxiety Inventory: The CSAI-2C. *Measurement in Physical Education and Exercise Science, 6*(3), 147- 165.

Strachan, L., & Munroe-Chandler, K. J. (2006). Using imagery to predict self-confidence and anxiety in young elite athletes. *Journal of Imagery Research in Sport and Physical Activity, 1*(1), 1-19. doi: 10.2202/1932-0191.1004

Tabachick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn and Bacon.

Tobin, D., Munroe-Chandler, K. J., Hall, C. R., Guerrero, M. D., Shirazipour, C. H., & Cooke, L. M. (2015). *Examining the relationship between children's active play imagery and basic psychological needs.* Manuscript submitted for publication.

Tobin, D., Nadalin, E. J., Munroe-Chandler, K. J., Hall, C. R. (2013). Children's active play imagery. *Psychology of Sport & Exercise, 14,* 371-378. doi:10.1016/j.psychsport.2012.12.007

Trochim, W. (2006). *Convergent and discriminant validity.* Retrieved from http://www.socialresearchmethods.net/kb/convdisc.php

Veitch, J., Salmon, J., & Ball, K. (2008). Children's active free play in local neighbourhoods: A behavioural mapping study. *Health Education Research, 23*, 870-879. doi:10.1093/her/cym074

Wang, J. C. K., Chatzisarantis, N. L. D., Spray, C. M., & Biddle, S. J. H. (2002). Achievement goal profiles in school physical education: Differences in self-determination, sport ability beliefs, and physical activity. *British Journal of Educational Psychology, 72,* 433–445.

Weinberg, R. S., & Gould, D. (2011). Children and sport psychology. In R. S. Weinberg & L. Petlichkoff (Eds.), *Foundations of sport and exercise psychology* (5th ed., pp. 491–510). Champaign, IL: Human Kinetics.

Weiss, M. R. (1991). Psychological skill development in children and adolescents. *The Sport Psychologist, 5,* 335-354.

Weiss, M. R. & Smith, A. L. (1999). Quality of Youth Sport Friendships: Measurement development and validation. *Journal of Sport & Exercise Psychology, 21,* 145-166.

White, A., & Hardy, L. (1998). An in-depth analysis of the use of imagery by high level slalom canoeists and artistic gymnasts. *The Sport Psychologist, 12,* 387-403.

Table 1

Hypotheses Table

Questionnaires	Convergent Validity	Discriminant Validity	Findings
Sport Imagery Questionnaire for Children (SIQ-C)	Cognitive Specific Cognitive General Motivational Specific Motivational General- Arousal Motivational General- Mastery (Capability and Fun Subscales)	N/A	Hypotheses Supported
Physical Activity Enjoyment Scale for Children (PACES for Children)	PACES for Children (Fun Subscale)	N/A	Hypothesis Supported
Sport Friendship Quality Scale (SFQS)	Self- Esteem Enhancement and Supportiveness (Social Subscale) Companionship and Pleasant Play (Social Subscale	N/A	Hypotheses Partially Supported
Competitive State Anxiety Inventory for Children (CSAI-2C)	Confidence (Capability Subscale)	Cognitive Anxiety Somatic Anxiety	Hypotheses Partially Supported

Table 2

Means, Standard Deviations, and Internal Consistencies for the Dependent Variables

Variable	*M*	*SD*	α
CAPIQ			
Fun	4.21	0.76	.73
Capability	3.33	0.97	.84
Social	3.83	0.77	.73
SIQ-C			
CS	3.56	0.90	.78
CG	3.48	0.75	.61
MS	3.97	0.73	.64
MG-M	3.79	0.69	.74
MG-A	3.61	0.82	.69
SFQS			
SEES	4.18	0.71	.74
CPP	4.51	0.56	.69
CSAI-2C			
Confidence	3.25	0.55	.76
Cognitive Anxiety	1.91	0.62	.73
Somatic Anxiety	1.90	0.69	.79
PACES for children	4.34	0.47	.89

Note. CAPIQ = Children's Active Play Imagery Questionnaire; SIQ-C = Sport Imagery Questionnaire for Children; CS = Cognitive Specific, CG = Cognitive General, MS = Motivational Specific, MG-M = Motivational General-Mastery, MG-A = Motivational General-Arousal; SFQS = Sport Friendship Quality Scale; SEES = Self Esteem Enhancement and Supportiveness, CPP = Companionship and Pleasant Play; CSAI-2C = Competitive State Anxiety Inventory for Children; PACES for children = Physical Activity Enjoyment Scale for Children. Scores for the CAPIQ, SIQ-C, SFQS, and PACES for Children can range from 1-5. Scores from the CSAI-2C can range from 1-4.

Table 3

Spearman Correlation Coefficients for Dependent Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Fun	-													
2. Capability	.30**	-												
3. Social	.49**	.21**	-											
4. CG	.29**	.44**	.24**	-										
5. CS	.19**	.26**	.20**	.40**	-									
6. MS	.32**	.31**	.25**	.38**	.41**	-								
7. MG-A	.38**	.41**	.28**	.48**	.43**	.55**	-							
8. MG-M	.39**	.47**	.35**	.60**	.49**	.55**	.61**	-						
9. Confidence	.36**	.30**	.30**	.45**	.35**	.47**	.45**	.51**	-					
10. Cognitive Anxiety	-.17*	.09	-.14*	-.08	-.09	-.14	-.22**	-.22**	-.38**	-				
11. Somatic Anxiety	-.07	.11	-.11	-.12	-.11	-.06	-.11	-.17*	-.18*	.52**	-			
12. SEES	.25**	.32**	.34**	.41**	.18*	.27**	.23**	.26**	.20**	-.05	-.02	-		
13. CPP	.31**	.17*	.18*	.35**	.17*	.22**	.30**	.31**	.20**	-.11	-.01	.40**	-	
1. PACES for Children	.40**	.38**	.28**	.44**	.32**	.51**	.43**	.54**	.59**	-.23	-.17	.27**	.26**	-

Note. CG = Cognitive General; CS = Cognitive Specific; MS = Motivational Specific; MG-A = Motivational General-Arousal; MG-M = Motivational General-Mastery; SEES = Self-Esteem Enhancement and Supportiveness; CPP = Companionship and Pleasant Play; PACES for children = Physical Activity Enjoyment Scale for Children.

*$p < .05$. **$p < .01$

LITERATURE REVIEW

Introduction

Beyond the obvious health benefits, physical activity provides many psychological benefits for children (Active Healthy Kids Canada [AHKC], 2010) such as improved overall psychological well-being (e.g., reduced depression and anxiety levels, and increased self-esteem). However, in order to reap these benefits, children must be engaging in physical activity through either structured or unstructured activity. The most recent report card concerning physical activity gave Canadian children an overall letter grade of D- in the physical activity domain (AHKC, 2014). Although this letter grade reflects a small improvement from the F previously received in 2012 (AHKC, 2014), it remains that only 7% of Canadian children aged 5-11 years and 4% of 12-17 year old youth are meeting the daily recommended physical activity guidelines of 60 minutes of moderate-vigorous physical activity per day (AHKC, 2014). Factors contributing to this lack of physical activity may include increased screen time, increased structured time activities (e.g., increased school work), and decreased active transportation (AHKC, 2014).

Research has further noted that children who rely solely on organized sport for their physical activity may contribute to this poor letter grade. Findings discussed in the current report card (AHKC, 2014) assert that many organized sport activities do not fulfil the daily physical activity guidelines. These findings identify the need for children to participate in a combination of structured (organized sport) and unstructured (active play) physical activities (AHKC, 2014). Active play is defined as unstructured physical activity that takes place in a child's free time (Veitch, Salmon, & Ball, 2008). Examples of active play include riding a bicycle with friends, playing tag in the backyard, or kicking a soccer

ball around. Despite the small improvement in the overall grade for physical activity from 2012-2014, active play has received an incomplete grade for the last two years (AHKC, 2014). This is due to the fact there is currently no evidence-based benchmark for active play against which to compare children to provide a letter grade. As such, further research in the area of active play is recommended (AHKC, 2014). Through active play, children develop decision making skills, learn to work in groups, resolve conflicts, and increase physical, cognitive, and emotional strength (Ginsberg, 2007).

Given the extensive benefits of physical activity for children, the motivation for children's participation has been of importance to researchers. This has allowed for the development of specific strategies aimed at increasing children's levels of physical activity. Hall (1995) was the first to establish imagery as a form of motivation for physical activity. Based on Hall's assertion, much of the subsequent imagery research was conducted with adult exercisers (e.g., Giacobbi, Hausenblas, Fallon, & Hall, 2003; Giacobbi, Hausenblas, & Penfield, 2005; Hausenblas, Hall, Rodgers, & Munroe, 1999). Although there has been considerable research examining children's use of imagery in sport (c.f., Munroe-Chandler & Hall, 2015), further exploration of imagery use by children in unstructured physical activity (active play) is warranted. In order to do so, a valid and reliable measure of active play imagery is required. After an in-depth qualitative study examining children's use of active play imagery (Tobin, Nadalin, Munroe-Chandler, & Hall, 2013), the Children's Active Play Imagery Questionnaire (CAPIQ; Cooke, Munroe-Chandler, Hall, Tobin, & Guerrero, 2014) was developed. The CAPIQ assesses children's (ages 7-14) use of imagery during active play. Given the ongoing nature of validation and due to the newness of the CAPIQ, validity evidence

needs to be further established (including convergent and discriminant validity). Consequently, the purpose of the current research study is to examine convergent and discriminant validity for the CAPIQ.

Imagery

Imagery is a mental skill that has been shown to influence changes in an individual's behaviour, thoughts, and beliefs (Hall, 2001). Simply, imagery is creating or recreating experiences mentally (Morris, Spittle, & Watt, 2005). A more complete and frequently used definition of imagery was developed by White and Hardy (1998) where they define imagery as:

> an experience that mimics real experience. We can be aware of "seeing" an image, feeling movements as an image, or experiencing an image of smell, tastes or sounds without actually experiencing the real thing… it differs from dreams in that we are awake and conscious when we form an image. (p. 389)

White and Hardy differentiate imagery from dreaming in that individuals are awake and in control during their imaging. This definition of imagery includes the various senses utilized within an image such as olfactory, visual, auditory, gustatory, tactile, and kinaesthetic. It has been well established that individuals of all ages including children are capable of imaging (Kosslyn, Margolis, Barrett, Goldknopf, & Daly, 1990; Piaget & Inhelder, 1971) with many studies focusing on youth athletes (Munroe-Chandler, Hall, & Fishburne, 2008; Munroe-Chandler, Hall, Fishburne, & Strachan, 2007; O, Munroe-Chandler, Hall, & Hall, 2014).

Imagery's positive impact on performance includes the enhancement of self-confidence and self-efficacy (Callow, Hardy, & Hall, 2001; Evans, Jones, & Mullen,

2004; Munroe-Chandler et al., 2008), increases in motivation (Beauchamp, Halliwell, Fournier, & Koestner, 1996; Martin & Hall, 1995), increases in collective efficacy (Munroe-Chandler & Hall, 2005), effective regulation of arousal levels (Giacobbi et al., 2003), and the improvement of concentration (White & Hardy, 1998).

Imagery Theories and Models

There have been numerous theoretical explanations for how imagery assists performance. The following theories aid in understanding why imagery functions in the manner it does (Morris et al., 2005). The popular cognitive theories (e.g., bioinformational theory, triple-code theory) within the imagery literature will be explored within this section as well as a conceptual framework of imagery (e.g., analytic framework), and various models of imagery use (e.g., applied model in sport and exercise). Cognitive theories emphasize how imagery is utilized and how images are stored (Morris et al., 2005). These early theories of imagery did not fully explain the effects of imagery but provided an important basis for current research.

Bioinformational theory. Lang (1979) combined research from three separate areas (i.e., psychophysiology, information processing approach to cognitive therapy, and behavioural therapy) to develop the bioinformational theory. Lang proposed that the brain's images are a conceptual framework, and establish a sample for outward behavioural expression. Within the bioinformational theory, propositions are the basic units of information and embody the meaning behind the image rather than the image itself. Two types of propositions were identified, namely stimulus propositions (i.e., content within the image), and response propositions (i.e., physiological reaction to the content of the image). Response propositions are reactions to the content an individual

would display in real situations. By imaging a different reaction to the image content it would allow for a possible modification of the reaction. Both response propositions and stimulus propositions should be used together when developing an image. Images that contain response propositions have been shown to prompt heightened physiological reactions (e.g., anxiety) than images encompassing only stimulus propositions. Lang suggested an individual can enhance control which improves performance by altering responses to situations through imagery. Overall, the bioinformational theory proposes that imagery is not merely the content of the image but the emotions and reactions associated with the situation.

The triple-code theory. Elaborating on Lang's (1979) theory, Ahsen (1984) proposed that there are three basic components of an image. The first component is the image itself defined as a centrally aroused sensation that embodies the characteristics of the actual sensation. This allows an individual to interact with the image as an individual would interact with a real world situation. The second component of an image is the somatic responses experienced by the imager. The somatic component is defined as psychophysiological change experienced by the individual while imaging a given situation. The third component, meaning, refers to the meaning behind the image itself. This component identifies that an individual will incorporate their personal experiences within an image, permitting that imagery experiences will differ between individuals. Ahsen proposed that meaning is especially important to imagery scripts as the image should hold significance for the individual to induce stronger behavioural responses that will lead to enhanced performance. The major difference between Lang's theory and

Ahsen's theory is the meaning component, which has been disregarded by many theories (Morris et al., 2005).

Framework for imagery use on human motor performance. Most of the current research in sport and to some degree exercise imagery originates from Paivio's (1985) analytic framework. Paivio proposed that imagery serves both a cognitive and motivational function which works within both a general and specific level. Cognitive specific (CS) imagery refers to imaging the performance of a specific motor skill such as a soccer player imaging the performance of a corner kick during a game, whereas cognitive general (CG) imagery refers to imaging strategies, or routines for example a gymnast imaging her floor routine. Motivational specific (MS) imagery refers to imaging individual goals and achievements such as winning a gold medal, whereas motivational general (MG) imagery refers to imaging physiological arousal levels and emotions related to performance for example a gymnast imaging being relaxed while completing her beam routine.

Extending Paivio's (1985) analytic framework Hall, Mack, Paivio, and Hausenblas (1998) found that imagery could be used for additional functions that were not provided within the original framework. The MG function of imagery was further separated into MG-arousal (MG-A) and MG-mastery (MG-M). MG-A refers to images associated with the arousal of performance, whereas MG-M refers to images of self-confidence and mental toughness. As previously mentioned, much of the sport (and to some extent exercise) imagery research conducted in the last two decades has relied on Paivio's analytic framework to guide the research. One limitation noted within the framework, however, is that it fails to explain the relationship between the function of

imagery and completion of specific performance outcomes (e.g., enhanced confidence) in training and competition settings (Martin, Moritz, & Hall, 1999).

The applied model of imagery use in sport. Observing the need to study the relationship between imagery function and imagery outcome, Martin et al. (1999) developed the applied model of imagery use in sport combining aspects of Lang's (1979) bioinformational theory and Ahsen's (1984) triple-code theory. This model aids in the description of how athletes use imagery to produce different cognitive, affective, and behavioural changes across a range of sport situations (Martin et al., 1999).

Four critical constructs were identified within the applied model of imagery use in sport including the sport situation, the function (type) of imagery used, imagery ability, and outcomes associated with imagery use (see Figure 1). Within sport, studies have shown that athletes use imagery in a variety of situations including prior to, during, or immediately following a competition (Jones & Stuth, 1997), during training (Barr & Hall, 1992), and during injury rehabilitation (Driediger, Hall, & Callow, 2006). The centre of the applied model of imagery use in sport is the type of imagery (function) used by athletes and it incorporates the functions of imagery established by Paivio (1985) and later modified by Hall et al. (1998) including CG, CS, MS, MG-A, and MG-M. These functions are then linked with different outcomes (Martin et al., 1999). For example, MG-M imagery use by an athlete is the most effective way to increase an athlete's self-efficacy as MG-M imagery incorporates images of confidence.

Imagery ability, which includes both kinaesthetic and visual imagery, moderates the relationship between the type of imagery used and the outcomes associated with imagery. That is, athletes with higher imagery ability experience greater benefits from

imagery than those with lower imagery ability (Nordin & Cumming, 2008). Martin et al. (1999) established the positive benefits imagery can have on the learning and performance of skills and strategies, modification of cognitions, and regulation of arousal and competitive anxiety. More recent researchers have noted that the components listed in the model might be incomplete, as additional components may exist (e.g., the meaning of the image; Cumming & Williams, 2013).

A review of the literature on the motivational and cognitive imagery use within exercise, sport, dance, and rehabilitation by Cumming and Williams (2013) led to revisions to the applied model of imagery use in sport (Martin et al., 1999). The revised model builds on the sport situation model which defined *where* and *when*, and the function of imagery which defined *why*, with the new additions including *who* and *meaning* components (Cumming & Williams, 2013). The revised model expanded on imagery ability through its influence on the association between imagery use and outcomes (see Figure 2). The *who* component recognizes the importance of the individual imaging and their interpretation of the image, which is further acknowledged through utilizing meaning as a bridge between imagery function and type of imagery. The idea that images mean different things to different individuals was stressed within Ahsen's (1984) triple-code theory. The revised model will aid future researchers and practitioners to create more effective imagery interventions for athletes, exercisers, dancers, and injury rehabilitation for more operative outcomes (Cumming & Williams, 2013).

The applied model of imagery use in exercise. The applied model of imagery use in exercise, developed by Munroe-Chandler and Gammage (2005) utilized the original applied model of imagery use in sport (Martin et al., 1999) as its foundation. The

model consists of five components: antecedents of imagery, functions of imagery, outcomes of imagery, efficacy beliefs, and potential moderating factors (see Figure 3). The model suggests that the location of imagery, imagery experience, exerciser's experience level, exerciser's goals, and individual's need to self-present as an exerciser may influence the imagery function. Similar to the sport model, each exercise imagery function leads to a specific outcome, which can be mediated by efficacy belief changes. The outcomes can feed back to the efficacy beliefs, and other variables may moderate the relationships (e.g., gender).

The proposed antecedents within the applied model of imagery use in exercise include the setting, experience, goals, and impression motivation. This is in support of Giacobbi et al. (2003) who noted that imagery for exercisers can occur both within the exercise setting and outside of the exercise setting. This model proposes that the five functions of imagery within exercise are consistent with the sporting context including CS, CG, MS, MG-A, and MG-M. These five imagery functions further lead to individuals' efficacy beliefs which include efficacy expectancy (e.g., imaging a skill properly executed may increase confidence and ability to complete the skill), outcome expectancy (e.g., imaging an individual exercising may help someone lose weight), outcome value (e.g., imaging health outcomes of exercise may help an individual appreciate one's health), and self-presentational efficacy (includes individuals presenting themselves as exercisers). The applied model of imagery use in exercise posits imagery outcomes can be divided into both cognitive and behavioural outcomes, and that imagery may increase exercise initiation for non-exercisers, and adherence for individuals who already exercise. Behavioural outcomes include acquisition/improvement of

skills/strategies, form, technique, initiation, and adherence. Cognitive outcomes consist of dependence, intention/motivation, arousal/anxiety, feeling states, and body image. The model further proposes that moderating factors affect both behavioural and cognitive outcomes which include gender, activity type, exercise frequency, imagery ability, age, physical health status, and personality. This model provides value in the development of future interventions aimed at increasing exercise behaviour (Munroe-Chandler & Gammage, 2005).

Imagery Measurements in Sport

Over the years, various imagery use questionnaires in sport have been developed (Munroe-Chandler & Morris, 2011). In one of the first sport specific measures of imagery use, Salmon, Hall, and Haslam (1994) developed the Imagery Use Questionnaire for Soccer Players (ISU-SP) to assess the functions of imagery described by Paivio (1985). Given that it was sport specific, this measure was limited to soccer and not applicable to other sports. However, it was the foundation on which the Sport Imagery Questionnaire (SIQ; Hall et al., 1998) was developed. The SIQ measures the frequency of imagery use (motivational and cognitive) by adult athletes competing in any sport at any level of competition (Hall et al., 1998).

The SIQ contains 30 items measuring the five functions of imagery (i.e., CS, CG, MS, MG-M, and MG-A). In this self-report questionnaire, all items are rated on a 7-point Likert scale (1= *rarely* to 7= *often*). Reliability for the SIQ is acceptable with internal consistency values ranging from 0.70- 0.88 (Hall, Stevens, & Paivio, 2005). Supporting the findings of Salmon et al. (1994), athletes reported using imagery more for motivational than cognitive reasons. This has been further supported in more recent

imagery research (Cumming & Hall, 2002; Cumming & Ramsey, 2009). Athletes also report using imagery more during competition than practice (Hall et al., 1998), which may help to explain athletes' frequent use of motivational images.

In addition to imagery research with adult athletes, there has been a surge of research studies completed with youth athletes (7-14 years; e.g., Munroe- Chandler et al., 2007). Due to the lack of a measure for children's imagery use in sport, the Sport Imagery Questionnaire for Children (SIQ-C; Hall, Munroe-Chandler, Fishburne, O, & Hall, 2009) was developed for children ages 7-14 years. It consists of 21 items measuring the five functions of imagery (i.e., CS, CG, MS, MG-A, and MG-M). The items are scored on a 5-point Likert scale ranging from 1= (*not at all*) to 5= (*very often*). The SIQ-C was developed through three phases during which adequate factorial, convergent, and discriminant validity and reliability were established (Hall et al., 2009).

In addition to assessing the frequency of an individual's imagery use, the imagery ability of an individual is important to measure. As described within the applied model of imagery use, imagery ability moderates the outcome of imagery (Martin et al., 1999). Through modifications to the Movement Imagery Questionnaire (MIQ; Hall, Pongrac, & Buckolz, 1985), Hall and Martin (1997) developed the readily used Movement Imagery Questionnaire-Revised (MIQ-R; Hall & Martin, 1997), which assesses the visual and kinesthetic imagery abilities of athletes. During revision of the original MIQ, items were removed from the questionnaire that were frequently found too difficult to complete and were often skipped by athletes. The Likert scale was also reversed such that a higher score represented a higher imagery ability with athletes finding it easier to complete those tasks (i.e., 1 = *difficult* to 7 = *easy*). The MIQ-R's final structure contained four items for

visual imagery and four items for kinaesthetic imagery (Hall & Martin, 1997). Adequate Cronbach alpha's were found (above 0.79) for both the visual and kinaesthetic subscales (Hall & Martin, 1997). Adequate reliability was found for the MIQ-R for both the visual and kinesthetic subscales: 0.82 and 0.88, respectively (Williams et al., 2012). The MIQ-R is a valid inventory used to assess individual differences in visual and kinesthetic image ability.

The Movement Imagery Questionnaire for Children (MIQ-C; Carter, Yoxon, Ste-Marie, Cumming, & Martini, 2013) assesses children's ability to image four movements using three types of imagery including kinaesthetic and internal and external imagery. Children rate their perceived ability to image 12 items on a 7– point Likert scale ranging from 1= (*very hard*) to 7 = (*very easy*). Adequate internal consistencies (> 0.70) have been reported for the MIQ-C in previous children's research (Guerrero, Tobin, Munroe-Chandler, & Hall, 2015).

Children's Imagery Use

Piaget and Inhelder (1971) studied children's use of imagery and proposed that children under the age of seven have difficulty producing moving images. This difficulty can hinder their judgements about the outcomes of physical transformations. They further suggested that children between the ages of four and seven could clearly represent static images only. However, children's ability to produce transformational images, including form and location changes within images improves during 8-12 years of age. After the age of 12, adolescents become adequate at logical hypothetical deductions, and by age 14, their imagery proficiency is similar to that of adults (Piaget & Inhelder, 1971).

Imagery use can have many benefits for children in a multitude of domains. For example, imagery can be used as a therapeutic tool for motor deficits caused by cerebral palsy (Steenbergen, Craje, Nilsen, & Gordon, 2009), to increase motor performance (Short, Afremow, & Overby, 2001), to decrease recurrent abdominal pain (Ball, Shapiro, Monheim, & Weydert, 2003), and to reduce post-operative pain (Huth, Broome, & Good, 2004). Pertinent to the academic domain, imagery has been found to increase memory recall (Taylor, 1970), as well as increase overall academic performance (Cohen & Johnson, 2010).

To further illustrate the positive impact of imagery on academic performance, Cohen and Johnson (2010) conducted an imagery intervention with second grade students on vocabulary acquisition abilities. Participants (*N*=15) were randomized into three intervention conditions: verbal presentation of the word (i.e., word only), a picture paired with the vocabulary word (i.e., dual coding), and creation of a mental image of the word in their mind and a drawing of it on paper (i.e., image creation). Students were taught 21 new words. The findings showed a significant difference between the image creation and word only interventions. Students further reported that the imagery intervention increased the ease with which they learned the new vocabulary (Cohen & Johnson, 2010). These findings highlight the implications for imagery use within the classroom.

Children's Use of Imagery in Sport

Imagery has been suggested to be a natural strategy for children which increases children's likelihood to practice as they have presumably used imagery during the learning and practicing of sport skills (Weiss, 1991), much of the imagery research has been conducted with adult athletes (Hall et al., 1998; Morris et al., 2005). Within adult

athlete sport imagery research, the four W's (what, where, when, why) had been well documented (e.g., Cumming & Williams, 2013; Munroe, Giacobbi, Hall, & Weinberg, 2000). However, little research had been dedicated to young athletes' use of imagery. As such, Munroe-Chandler et al. (2007) implemented a focus group approach to examine the where, when, why, and what of youth athletes' (7-14 years) imagery use. The results were found to parallel those of adult athletes, with participants in the study reporting imagery use for training and competition and including all five types of motivational and cognitive imagery. However, the type of imagery used by youth athletes was more inclined towards cognitive imagery due to the need of youth athletes for developing fundamental sport skills.

An important aspect in sport is skill and strategy development and execution. Li Wei, Qi-Wei, Orlick, and Zitzelsberger (1992) conducted a study utilizing CS imagery to increase youth athlete's accuracy and technical quality of their table tennis shot. Children who engaged in CS imagery had significantly greater improvements in accuracy and technical quality than children in comparison groups. Further, Munroe-Chandler, Hall, Fishburne, Murphy, and Hall (2012) found a CS imagery intervention led to faster completion of soccer skills than having not received the intervention. In addition, Chandler, Hall, Fishburne, and Shannon (2005) conducted an imagery intervention focusing on CG imagery (e.g., execution of a corner kick in soccer) with elite youth soccer players. Results showed an increase in both CG and CS imagery for soccer players over the course of the study, as well as noted improvements in soccer strategies. The authors argue that when imaging sport strategies, the specific sport skills needed to complete that strategy will also be imaged.

Given that the function of imagery (i.e., CS, CG, MS, MG-M, and MG-A) should match the desired outcome (Martin et al., 1999), if an athlete wanted to increase self-efficacy, MG-M imagery should be the function utilized. Following that assertion, O et al. (2014) conducted an individualized MG-M imagery intervention on youth squash players (7-14 years) aiming to increase self-efficacy. Three of the five athletes showed increases in self-efficacy highlighting that children's use of MG-M imagery is related to their self-efficacy consistent with previous adult athlete imagery research (Munroe-Chandler et al., 2008). Munroe-Chandler and Hall (2005) conducted a further study using MG-M imagery with youth female soccer players to increase collective efficacy for the team. Findings revealed an increase in collective efficacy for both training and competition for two of the three groups (forwards, midfielders, and defense/goal keeper).

Play

Play has been described as the work of a child (Piaget, 2007) and is an integral part of a child's development. In fact, the United Nations High Commission for Human Rights, under the Convention of the Rights of the Child has stated play as the right of every child (Office of the United Nations High Commissioner for Human Rights, 1989). Research has further noted key aspects associated with play including enjoyment, and ensuring children maintain internal control, motivation, and reality (Bergen, 2009). Therefore, children engaging in play should self-select the activity, be actively engaging in the play, shape their play to fit personal experiences, and have fun (Bergen, 2009). Despite the many positive benefits associated with play (Burdette & Whitaker, 2005; Ginsberg, 2007), there has been a large decline in children's play (Gray, 2011).

Through play opportunities, children develop intrinsic interests and competencies, learn how to make decisions, solve problems, exercise self-control, follow rules, regulate emotions, make friends, play as equals, and experience joy, which all lead to the promotion of good mental health (Gray, 2011). However, play that is controlled by adults may negatively affect the benefits of play for children by limiting a child's development of creativity, leadership, and group skills (Ginsberg, 2007). Through play, children are able to utilize their creativity while developing their imagination, dexterity, as well as physical, cognitive, and emotional strength (Ginsberg, 2007). Overall, play is particularly important for children and has been found to promote the development of a healthy brain (Ginsberg, 2007).

Hofferth and Sandberg (2001) asked parents to keep records of their children's activities on days randomly selected by the researchers in both 1981 and 1997. They found that children engaged in less play in 1997 and had less time for intrinsically chosen activities than in 1981. Furthermore, Hofferth and Sandberg found that in 1997 children 6-8 years of age had a 25% decrease in play time, 55% decrease in time spent talking with others at home, and a 145% increase in time spent completing school work at home when compared to children in 1981. Children were also found to participate in a total of only 11 hours of play activities per week, including both active and sedentary activities, in the year 1997. It could be expected that since 1997, the number of hours children engaged in play activities, both active and sedentary, would have continued to decline. There are many factors that may have changed the way children participate in play including, change in the family dynamic (single parent homes), school systems becoming

more rigorous, children becoming passively entertained through television and computer games, and safety concerns within the communities (Ginsberg, 2007).

Active Play

Active play is an important component of children's overall physical activity behavior (AHKC, 2014). As a result, it is important to examine children's active play. Children may engage in active play indoors or outdoors; although, active play that occurs outdoors may provide children with more independence and opportunities to take part in unstructured physical activity due to the nature of outdoor play being more removed from adult supervision (Ginsberg, 2007). Raustorp et al. (2012) found that physical activity was significantly higher outdoors than indoors for children. Active play contains a distinctive feature from play in that the activity is significantly above resting metabolic rate (Brockman, Fox, & Jago, 2011).

Recent Canadian statistics show that 73% of Canadian parents agree their children should participate in active play on a daily basis (AHKC, 2014). Parents play a key role in their child's active play as active parents have been found to positively influence their children's physical activity behaviour by providing their children with more time playing outdoors and/or participating in unorganized activities after school in comparison to children of inactive parents (AHKC, 2014).

Brockman, Jago, and Fox (2011) sought to investigate the factors that limit or facilitate active play for children, as well as to understand why children engage in active play. Focus groups were conducted with 77 children (10-11 years). They found freedom, socialising, prevention of boredom, and obtaining health benefits motivated children to engage in active play. Parental constraints and children's perceived constraints were

found to limit children's active play, whereas neighbourhood play spaces and technology (cell phones) facilitated children's active play. Parents felt their children were safer when in possession of a cell phone and able to play further from home.

Due to active play being freely chosen by children, researchers have investigated this activity as it relates to the basic needs theory, a component of the self-determination theory (Deci & Ryan, 2002), which focuses on fulfilling the three basic needs of autonomy, competence, and relatedness. Using self-determination theory as a foundation to examine individual's motivation engage in active play, Hagger, Chatzisarantis, Culverhouse, and Biddle (2003) identified a link between perceived autonomy support and intrinsic motivation for leisure time physical activity (including active play) in 13-16 year old students. Furthermore, Standage, Duda, and Ntoumanis (2003) examined the need satisfaction of the three basic psychological needs (i.e., autonomy, competence, and relatedness) in the physical education environment and intention to engage in leisure time physical activity for high school students. Autonomy is the source of one's own behaviour, competence refers to feelings of success in interactions with the social environment, and relatedness refers to a sense of belonging (Deci & Ryan, 2002). A perceived autonomy supportive setting was found for the physical education environment to promote the satisfaction of three needs within the basic needs theory which predicted intrinsic motivation to engage in leisure time physical activity. This research provides support for the relation between the self-determination theory and motivation to participate in active play.

Benefits of Active Play

Behaviours developed within active play have the potential to be more innovative than structured behaviours practiced under adult supervision (Kantomaa et al., 2013). Specifically, problem solving develops during unstructured play and stimulates executive functioning, which includes attention, planning, organizing, sequencing, and decision making (Burdette & Whitaker, 2005). Executive functioning supports children's future academic success, as well as daily living tasks that induce children's independence (Burdette & Whitaker, 2005). Furthermore, a national survey completed within the United States identified that 90% of teachers and 86% of parents believe that physically active children learn and behave better within the classroom (Burdette & Whitaker, 2005).

Children have further been shown to participate in play and active play for intrinsic reasons, such as enjoyment rather than external rewards; therefore, indicating that children value play itself over the outcomes of playing (Witherspoon & Manning, 2012). This finding is in contrast with children's motivation in the school setting, wherein children typically perform to obtain high grades and recognition from the teacher for their performance. Similarly, the finding is also contrary to research on children's involvement in organized sport, such that one of the reasons children may participate in organized sport is to win games, gold medals, and trophies (extrinsic goals; Anderson & Pease, 1981). Within the context of active play, children are capable of altering or changing rules of activities and selecting different activities based on their own personal interests and level of enjoyment (Bergen, 2009; Canadian Sport for Life, 2014); thus, supporting intrinsic motives to promote active play.

Brockman, Jago, and Fox (2010) examined the relationship between active play and physical activity in a large sample of male and female students aged 10-11 years. They found that frequent active play was associated with mean activity levels for boys only on the weekend whereas for girls active play was associated with mean activity levels after school during the week as well. Girls who participated in active play, five or more days per week, had higher physical activity levels throughout the week, than girls who participated less often in active play. Taken together the findings suggest that higher levels of active play are related to higher overall activity levels and greater intensity of physical activity across both genders (Brockman et al., 2010). The resultant link between active play and physical activity may aid future intervention studies aimed at increasing overall physical activity levels in children.

Decline in Active Play

Although there are many benefits (social, emotional, physical) to active play (Burdette & Whitaker, 2005), there has been a steady decline in children's participation in active play. In 1973, a UK study identified 75% of children under the age of 15 years played outside within their neighbourhoods (Department of the Environment, 1973). However, in 2005 in the UK only 15% of children between the ages of 5-15 years played outside within their neighbourhood (Department of Transport, 2005). Possible reasons for this decline in play are parents' concerns about safety within their neighbourhood and the new culture of over scheduling children with enrichment activities and sporting endeavours (Brockman, Fox, & Jago, 2011). A child's circumstances and their environment may also play a role in the decline of active play. Specifically, children from low socioeconomic status (SES) homes have been found to be less active than children

from high SES homes (Veitch et al., 2008). In addition, access to parks has been found to influence children's participation in physical activity or active play, with children further from parks participating less in active play (Veitch et al., 2008). Therefore, it is important to understand both children's specific play activities, as well as the unsupervised travel of children to play areas, to better determine methods to increase physical activity in children (Oliver et al., 2011). Further, the use of technology (e.g., television viewing, computer games, smart phones), which include sedentary activities compete with active play for a child's attention (Burdette & Whitaker, 2005).

Clements (2004) conducted a study in which mothers compared their own active play experiences with their children's active play experiences. Eighty five percent of mothers agreed that their own children (3-12 years of age) played outside less than they had played outside at the same age. Additionally, 70% of the mothers stated that when they were growing up they played outside every day, with 56% of the 70% stating when they did play outside as a child they played for at least three hours at a time. Mothers stated this was different from their children, as only 31% of mothers stated their children played outside daily, with only 22% of those playing for three hours or longer at a time. Most mothers cited television and computer time as reasons children no longer participate in outdoor active play. However, most mothers also indicated restricting their child's outside play due to safety concerns (Clements, 2004).

Another study completed collected data on active play and screen time for children 4-12 years of age were analyzed from the National Health and Nutrition Examination Surveys from both 2001 and 2004 (Andersen, Economos, & Must, 2008). Within this study, high screen time was defined as more than two hours per day and low

active play was defined as six or less times per week. Over the three year span, 37.3 % of children had low levels of active play, 65% had high screen time, and 26.3% had both behaviours (low levels of active play and high screen time). This study highlights screen time as a potential reason for the decline in active play. Being able to identify those factors that had influenced children's previous active play activities may aid in increasing levels of active play for children (Holt, Lee, Millar, & Spence, 2013).

Active Play Imagery

There has been well documented research in the area of adults' and children's imagery in sport and adults' exercise; however, researchers have only begun to conduct imagery research on children outside of the sport domain (e.g., active play). Given children typically do not take part in structured exercise, the need for further research on imagery in children's unstructured physical activity (active play) was warranted. In one of the first active play imagery studies, Tobin et al. (2013) qualitatively examined the content of children's mental images in active play. One hundred and four children aged 7-14 years participated in focus groups to identify the content of their active play imagery, and how their active play images satisfy the three basic psychological needs (e.g., autonomy, competence, and relatedness) from the basic needs theory (Deci & Ryan, 2002). Results indicated that children do engage in imagery during their active play and that their images related to the three basic psychological needs. The higher order themes for autonomy included favourite activity, fun activity, frequent activity, and feelings. Higher order themes for competence included being good, body, skill improvement, strategy, winning, and feeling. The final higher order themes for relatedness included playmates, rationale, and feelings. Children were found to image activities they enjoy and

often participate in. They also played with friends and family during their imagery, and imaged themselves being good at active play (Tobin et al., 2013). The findings from this study indicated that children use imagery during their active play and therefore imagery may be a viable and cost effective method to increase children's motivation to participate in unstructured physical activity.

Measurement of Active Play Imagery

Given the qualitative nature of Tobin et al.'s (2013) study, it was necessary to conduct further quantitative research in the area of active play imagery use, and as such the development of a measure to assess children's imagery use during active play was essential. Three phases were used to develop the CAPIQ (Cooke et al., 2014), including item development, content validity, and factorial validity. In Phase 1, an operational definition of active play was established which reads unstructured physical activity that takes place in a child's (7- 14 years) free time (Veitch et al., 2008). Following establishment of the definition an initial pool of 32 items were developed then further reduced to 16 items using previous active play literature (Tobin et al., 2013). Items were separated into three broad themes: capability, fun, and social imagery. Capability imagery includes perceptions of self-efficacy, competence, and intention to be active. Fun imagery includes enjoyment and interest, whereas social imagery includes encouragement from parents, peers, and friend's participation. The above themes correspond with the findings from Tobin et al.'s qualitative study on children's use of imagery in active play. Within Phase 1, all the original capability imagery items were deleted and replaced as the expert panel identified comprehension concerns (i.e., poor content relevance) with the items and a lack of association between the items and the capability subscale. Therefore, five new

items were developed and the stem "*When thinking about active play*" was added to each item to increase clarity. The preliminary CAPIQ therefore consisted of 12 items (Cooke et al., 2014).

Phase 2 of development assessed the content validity of the 12 item CAPIQ with 302 children (aged 7-14 years). A principal component analysis (PCA), which allows variables to freely relate with one another and describe the underlying components was utilized. The PCA results led to the retention of 11 items under three subscales: capability, social, and fun imagery. Capability imagery contained four items, social imagery contained four items, and fun imagery contained three items (Cooke et al., 2014). Two of the three subscales had adequate internal consistency, capability and social imagery (α's > 0.70), with the third subscale approaching adequate internal consistency fun imagery (α = 0.65; Cooke et al., 2014). Fun imagery was found to be utilized most frequently with children, displaying that children associate active play most with joy (Cooke et al., 2014).

Phase 3 was used to conduct a confirmatory factor analysis (CFA) on the 11 item CAPIQ in order to analyze the fit of the three factor model. An ANOVA was conducted in addition to examine differences in children's active play imagery for both age and gender. The comparative fit index (CFI), normative fit index (NFI), Tucker-Lewis index (TLI), root-mean square error of approximation (RMSEA), and standardized root-mean-square residual (SRMSR) were used. The initial CFA resulted in acceptable fit with the CFI = 0.95, NFI= 0.92, TLI = 0.93, RMSEA = 0.07, and SRMSR= 0.06 (Cooke et al., 2014), which met or closely approached the cut-off values (Browne & Cudeck, 1993; Hu & Bentler, 1999). The ANOVA results showed both male and female participants used

fun imagery most followed by social and capability imagery. Overall, there were no significant differences found between the age cohorts (7-10 years of age and 11-14 years of age). The final version of the CAPIQ measures children's (7-14 years) use of imagery during active play and consists of 11 items divided among three subscales: fun (three items), social (four items), and capability (four items), which are rated on a 5- point Likert Scale ranging from 1= (*not at all*) to 5 = (*very often*; Cooke et al., 2014).

Active Play Imagery Studies

Guerrero (2013) conducted a pilot imagery intervention, using the recently developed CAPIQ as a measure of active play imagery use. Participants included 17 female students between the ages of 9-10 years old. Students were randomly assigned to either an imagery (listened to an automated imagery script) or control (listened to an automated short story) group. Each group listened to the automated script or story three times per week throughout the two week study. Adequate internal consistencies were found for all of the CAPIQ subscales (α = 0.73- 0.90; Guerrero, 2013). The participants in the imagery group reported higher frequency of imagery use on all three imagery subscales (i.e., capability (r = -0.84), fun (r = -0.85), social (r = -0.60)) when compared to the control group. Even though the imagery group did not display a significant increase in imagery use scores from pre- to post-intervention, Guerrero proposed this may be due to methodological issues within the study including the nature of the study being a pilot study.

Tobin et al. (2015) conducted an investigation on the relationship between children's active play imagery (fun, social, capability imagery) and the three basic psychological needs (autonomy, competence, relatedness). Expanding upon their

previous qualitative study (Tobin et al., 2013), participants (*N* = 253, 7- 14 years) completed the CAPIQ (Cooke et al., 2014) and the Basic Needs Questionnaire for Children (BNQ-C; Gray, Prapavessis, & McGowan, 2009). Both capability imagery and fun imagery were shown to be positively related to the need for competence. Additionally, social imagery was found to be positively related to the need for relatedness. The findings emphasize the potential for imagery use to motivate children's participation in active play activities and ultimately increase physical activity participation for children.

Psychometric Testing of the CAPIQ

Initial content and factorial validity (using both a PCA and CFA) of the recently developed CAPIQ are strong (Cooke et al., 2014). However, these are not the only two types of validity and psychometric tests that are conducted when validating questionnaires. Construct validity is the ability to demonstrate that a questionnaire measures what it intends to measure through comparison to the operationalized definition. Construct validity, includes both convergent and discriminant validity (Field, 2013; Trochim, 2006) and was not established during the initial development of the CAPIQ. Due to the ongoing nature of validation for inventories, the purpose of the current research study was to examine both convergent and discriminant validity of the CAPIQ.

Convergent and Discriminant Validity

Convergent validity is the measure of conceptual elements of a questionnaire and the degree to which the elements are similar to another inventory they should be theoretically similar to (Trochim, 2006). Convergent validity therefore needs to show that

measures that should be theoretically related are related in reality (Trochim, 2006). For example, a questionnaire measuring self-esteem should be related to other measures or inventories that intend to measure self-esteem, self-concept, or self-efficacy.

Discriminant validity further measures the degree to which constructs that should not be theoretically related to one another are, in reality, not related to each other (Trochim, 2006). For example, an inventory measuring self-esteem should not be related to an inventory measuring anxiety or arousal. Both convergent and discriminant validity are measured by the degree to which constructs are related or unrelated to one another. Therefore, correlations are used to determine the degree of association between constructs. Correlations (*r*), measure the strength of relationship between two constructs (Field, 2013). In accordance with Brace, Kemp, and Snelgar (2006), a weak correlation is ≤ .2, a moderate correlation is = .3 - .6, and a strong correlation is ≥ .7. Convergent validity should have a moderate to high correlation coefficient or (.3 - .6, or ≥ .7) and discriminant validity should have a weak correlation coefficient (≤ .2; Trochim, 2006) or no correlation. Convergent validity works with discriminant validity together providing evidence for construct validity as both are needed to establish more adequate validity evidence (Trochim, 2006).

Subjective Measures for Convergent and Discriminant Validity

The SIQ-C (Hall et al., 2009) was developed to measure young athletes' (7-14 years) use of imagery in sport. The SIQ-C is composed of 21 items representing five subscales (i.e., CS, CG, MS, MG-A, and MG-M). All items are scored on a 5-point Likert scale of (1= *not at all* to 5= *very often*). A range of Cronbach alpha's between 0.69- 0.82 were found for all five subscales, which are either adequate or approaching adequate

internal consistency (Hall et al., 2009). The SIQ-C will be used to establish convergent validity of the fun and capability imagery subscales of the CAPIQ (see Table 1). The MG-M subscale of the SIQ-C measures images of oneself being confident (e.g., Munroe-Chandler et al., 2008), and is therefore expected to positively correlate with the capability subscale of the CAPIQ (convergent validity). The remaining subscales of the SIQ-C are expected to correlate with the fun and capability imagery subscales of the CAPIQ as the underlying component of both questionnaires is imagery use within a physical activity context (providing evidence for convergent validity).

The Competitive State Anxiety Inventory for Children (CSAI-2C; Stadulis, MacCracken, Eidson, & Severance, 2002) is a multidimensional inventory assessing competitive anxiety and confidence in children. However, during its development the CSAI- 2C was modified for use with play and it was that inventory that was utilized within the current study (Stadulis et al., 2002). The CSAI-2C contains 15 items separated into three subscales of cognitive anxiety (e.g., worry), somatic anxiety (e.g., sweaty palms, butterflies), and confidence (e.g., feeling certain) with all items rated on a 4-point Likert scale (1= *not at all* to 4 = *very much so*). The CSAI-2C is appropriate for use with children as young as 8 years of age and has shown adequate reliability with alphas ranging from .73-.78 (Stadulis et al., 2002). This questionnaire will be utilized to establish convergent validity through the confidence subscale, which is expected to positively correlate with the capability subscale of the CAPIQ. Further, the cognitive and somatic anxiety subscales of the CSAI- 2C are not expected to positively correlate with any subscales of the CAPIQ, thus providing evidence of discriminant validity.

The Physical Activity Enjoyment Scale for Children (PACES for children; Moore et al., 2009) is a measure of enjoyment during physical activity. It has been modified for use with children (8 years of age and older) from the original adult version (Kendzierski & DeCarlo, 1991). The PACES for children is a 16-item self-report unidimensional questionnaire rated on a 5 point Likert scale (1 = *disagree a lot* to 5 = *agree a lot*). The PACES for children displays good internal consistency ($\alpha = 0.87$) with the CFA supporting the unidimensional structure (Moore et al., 2009). The PACES for children is expected to positively correlate with the fun subscale of the CAPIQ providing support for convergent validity.

The Sport Friendship Quality Scale (SFQS; Weiss & Smith, 1999) is a 22- item multidimensional questionnaire measuring six subscales: self- esteem enhancement and supportiveness (four items), loyalty and intimacy (four items), things in common (four items), companionship and pleasant play (four items), conflict resolution (three items), and conflict (three items). Children (as young as 8) score all items on a 5-point Likert scale (1= *not true at all* to 5= *really true*). The reliability for each subscale is acceptable with scores between $\alpha = 0.73$- 0.91 (Weiss & Smith, 1999). Two subscales (self-esteem enhancement and supportiveness and companionship and pleasant play) will be utilized for convergent validity as the other subscales within the SFQS should not be theoretically similar to the CAPIQ. As well, due to the age of participants (9- 14 years), it is important to ensure the questionnaire package is not too long and tiresome. Both self-esteem enhancement and supportiveness (i.e., friend's support) and companionship and pleasant play (i.e., getting along well with friends) from the SFQS are expected to positively

correlate with the social subscale of the CAPIQ thus providing additional support for convergent validity.

Implications of Current Study

With the continual decrease in physical activity such that 93% of our Canadian children are not meeting the recommended daily physical activity guidelines of 60 minutes of moderate to vigorous physical activity per day (AHKC, 2014), it is vital to explore ways to motivate our children to be active. One way to increase levels of physical activity is through active play. In fact, active play is a main component of physical activity for children (AHKC, 2014). In the scant research examining imagery use in active play, the results show promise for imagery as a strategy in increasing children's level of physical activity; however further research is warranted. Through validation of the CAPIQ, further research can be conducted within the field of active play imagery. This will aid future studies in improving physical activity levels through active play in children. Further, an evidence-based benchmark on which to measure children against to award a grade may be developed.

References

Active Healthy Kids Canada (AHKC; 2010). Healthy attitudes start earlier than you think. *The 2010 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth.* Toronto, ON.

Active Healthy Kids Canada (AHKC; 2012). Is active play extinct? *The 2012 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth.* Toronto, ON.

Active Healthy Kids Canada (AHKC; 2014). Is Canada in the running? How Canada stacks up against 14 other countries on physical activity for children and youth. *The 2014 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth.* Toronto, ON.

Ahsen, A. (1984). ISM: The triple code model for imagery and psychophysiology. *Journal of Mental Imagery, 8,* 15- 42.

Andersen, S. E., Economos, C. D., & Must, A. (2008). Active play and screen time in US children aged 4 to 11 years in relation to sociodemographic and weight status characteristics: A nationally representative cross-sectional analysis. *BMC Public Health, 8,* 366.

Anderson, D. F., & Pease, D. G. (1981). Children's motor and social skill and attitudes toward sport team involvement. *Journal of Sport Behaviour, 4*(3), 128-136.

Ball, T. M., Shapiro, D. E., Monheim, C. J., & Weydert, J. A. (2003). A pilot study of the use of guided imagery for the treatment of recurrent abdominal pain in children. *Clinical Pediatrics, 42*(6), 527- 532.

Barr, K., & Hall, C. R. (1992). The use of imagery by rowers. *International Journal of Sport Psychology, 23,* 243- 261.

Beauchamp, P. H., Halliwell, W. R., Fournier, J. F., & Koestner, R. (1996). Effects of cognitive-behavioural psychological skills training on the motivation, preparation, and putting performance of novice golfers. *The Sport Psychologist, 10*, 157-170.

Bergen, D. (2009). Play as the learning medium for future scientists, mathematicians, and engineers. *American Journal of Play, 1,* 413- 428.

Brace, N., Kemp, R., & Snelgar, R. (2006). *SPSS for psychologists: A guide to data analysis using SPSS for windows* (3rd ed.). London: Routledge.

Brockman, R., Fox, K. R., & Jago, R. (2011). What is the meaning and nature of active play. *International Journal of Behavioural Nutrition and Physical Activity, 15*(7), 1-7.

Brockman, R., Jago, R., & Fox, K. R. (2010). The contribution of active play to the physical activity of primary school children. *Preventive Medicine, 51,* 144-147. doi: 10.1016/j.ypmed.2010.05.012

Brockman, R., Jago, R., & Fox, K. R. (2011). Children's active play: Self- reported motivators, barriers, and facilitators. *BMC Public Health, 11*, 461.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136- 162). Newbury Park, CA: Sage.

Burdette, H., & Whitaker, R. (2005). Resurrecting free play in young children. *Archives of Paediatric and Adolescent Medicine, 159,* 46-50. doi: 10.1001/archpedi.159.1.46

Callow, N., Hardy, L., & Hall, C. R. (2001). The effects of a motivational general-mastery imagery intervention on the sport confidence of high- level badminton players. *Research Quarterly for Exercise and Sport, 72,* 389- 400.

Canadian Sport for Life (CS4L; 2014). *The Long Term Athlete Development Model 2.0.* Retrieved from http://canadiansportforlife.ca/resources/ltad-resource-papers

Carter, M. J., Yoxon, E., Ste-Marie, D. M., Cumming, J., & Martini, R. (2013). The validation of a Movement Imagery Questionnaire for Children (MIQ-C). *Journal of Sport & Exercise Psychology,* S23.

Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood, 5,* 68- 80.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). New York: Academic Press.

Cohen, M. T., & Johnson, H. L. (2010). Improving the acquisition of novel vocabulary through the use of imagery interventions. *Early Childhood Education Journal, 38*, 357- 366.

Cooke, L., 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, 32*(9), 860-869. Retrieved from http://dx.doi.org/10.1080/02640414.2013.865250

Cumming, J., & Hall, C. (2002). Athletes' use of imagery in the off-season. *The Sport Psychologist, 16,* 160-172.

Cumming, J., & Ramsey, R. (2009). Imagery interventions in sport. In S.D. Mellalieu & S. Hanton (Eds.), *Advances in applied sport psychology: A review* (pp. 5-36). New York: Routledge.

Cumming, J., & Williams, S. E. (2013). Introducing the revised applied model of deliberate imagery use for sport, dance, exercise, and rehabilitation. *Movement & Sport Sciences, 82,* 69-81. doi: 10.1051/sm/2013098

Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research.* Rochester, NY: University of Rochester.

Department of the Environment (1973). *Children at play.* Design Bulletin 27. London: HMSO.

Department of Transport (2005). *Focus on personal travel*. London: The Stationary Office.

Driediger, M., Hall, C. R., & Callow, N. (2006). Imagery use by injured athletes: A qualitative analysis. *Journal of Sport Sciences, 24*(3), 261-271. doi; 10.1080/02640410500128221

Evans, L., Jones, L., & Mullen, R. (2004). An imagery intervention during the competitive season with an elite rugby union player. *The Sport Psychologist, 18,* 252- 271.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Thousand Oaks, CA: SAGE Publications Inc.

Giacobbi, P. R., Jr., Hausenblas, H. A., Fallon, E. A., & Hall, C. R. (2003). Even more about exercise imagery: A grounded theory of exercise imagery. *Journal of Applied Sport Psychology, 15,* 160-175.

Giacobbi, P. R., Jr., Hausenblas, H. A., Penfield, R. D. (2005). Further refinements in the measurement of exercise imagery: The Exercise Imagery Inventory. *Measurement in Physical Education and Exercise Science, 9*(4), 251- 266. doi: 10.1207/s15327841mpoo0904_4

Ginsberg, K. R. (2007). The importance of promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics, 119,* 182-191. doi:10.1542/peds.2006-2697.

Gray, C., Prapavessis, H., McGowan, E. (June, 2009). *Self -efficacy and basic psychological needs instrument validation*. Paper presented to the International Society for Behavioral Nutrition and Physical Activity, Lisbon, Portugal.

Gray, P. (2011). The decline of play and the rise of psychopathology in children and adolescents. *American Journal of Play, 1,* 283-312.

Guerrero, M. D. (2013). *Effects of a guided imagery intervention on children's active play: A pilot study* (Master's Thesis). University of Windsor, Windsor, ON.

Guerrero, M. D., Tobin, D., Munroe-Chandler, K. J., & Hall, C. R. (2015, in press). Tigers and Lions, Oh My! Effect of a guided imagery intervention on children's levels of active play. *Journal of Applied Sport Psychology. DOI: 10.1080/10413200.2015.1030797*

Hagger, M. S., Chatzisarantis, N. L., Culverhouse, T., & Biddle, S. J. (2003). The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behaviour: A trans-contextual model. *Journal of Educational Psychology, 95,* 784-795. Retrieved from http://dx.doi.org/10.1037/0022-0663.95.4.784

Hall, C. R. (1995). The motivational function of mental imagery for participation in sport and exercise. In J. Annett, B. Cripps, & H. Steinberg (Eds.), *Exercise addiction: Motivation for participation in sport and exercise* (pp. 17-23). Leicester, UK: British Psychology Society.

Hall, C. R. (2001). Imagery in sport and exercise. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of research on sport psychology* (2nd ed., pp. 529- 549). New York: Wiley.

Hall, C. R., Mack, D. E., Paivio, A., & Hausenblas, H. A. (1998). Imagery use by athletes: Development of the Sport Imagery Questionnaire. *International Journal of Sport Psychology, 29,* 73- 79.

Hall, C. R., & Martin, K. A. (1997). Measuring movement imagery abilities: A revision of the Movement Imagery Questionnaire. *Journal of Mental Imagery, 21,* 143-154.

Hall, C. R., Munroe-Chandler, K. J., Fishburne, G.O., O. J, & Hall, N. D. (2009). The Sport Imagery Questionnaire for Children. *Measurement in Physical Education and Exercise, 13,* 93-107.

Hall, C. R., Pongrac, J., & Buckolz, E. (1985). The measurement of imagery ability. *Human Movement Science, 4,* 107- 118.

Hall, C. R., Stevens, D. E., & Paivio, A. (2005). *The Sport Imagery Questionnaire: Test manual.* Morgantown, WV: West Virginia University.

Hausenblas, H. A., Hall, C. R., Rodgers, W. M., & Munroe, K. J. (1999). Exercise imagery: Its nature and measurement. *Journal of Applied Sport Psychology, 11,* 171-180.

Hofferth, S. L., & Sandberg, J. F. (2001). Changes in American children's time, 1981-1997. In T. J. Owens and S. L. Hofferth (Eds.), *Advances in life course research* (pp. 193-229). New York: Elsevier Science.

Holt, N. L., Lee, H., Millar, C. A., & Spence, J. C. (2013). Eyes on where children play: A retrospective study of active free play. *Children's Geographies,* 1-16. doi: 10.1080/14733285.2013.828449

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1- 55.

Huth, M. M., Broome, M. E., & Good, M. (2004). Imagery reduces post-operative pain. *Pain, 110*, 439- 448.

Jones, L., & Stuth, G. (1997). The uses of mental imagery in athletics: An overview. *Applied and Preventative Psychology, 6*, 101-115.

Kantomaa, M. T., Purtsi, J., Taarila, A. M., Remes, J., Viholainen, H., Rintala, P., … Tammelin, T. H. (2011). Suspected motor problems and low preference for active play in childhood are associated with physical inactivity and low fitness in adolescence. *PloS One, 6*(1), e14554. doi: 10.1371/journal.pone.0014554

Kendzierski, D., & DeCarlo, K. L. (1991). Physical Activity Enjoyment Scale: Two validation studies. *Journal of Sport & Exercise Psychology, 13,* 50-64.

Kosslyn, S. M., Margolis, J. A., Barrett, A. M., Goldknopf, E. J., & Daly, P. F. (1990). Age differences in imagery abilities. *Child Development, 61*(4), 995- 1010.

Lang, P. J. (1979). A bio-informational theory of emotional imagery. *Psychophysiology, 16,* 495- 512.

Li-Wei, Z., Qi-Wei, M., Orlick, T., & Zitzelsberger, L. (1992). The effect of mental-imagery training on performance enhancement with 7-10 year old children. *The Sport Psychologist, 6,* 230-241.

Martin, K. A., & Hall, C. R. (1995). Using mental imagery to enhance intrinsic motivation. *Journal of Sport & Exercise Psychology, 17,* 54- 69.

Martin, K. A., Moritz, S. E., & Hall, C .R. (1999). Imagery use in sport: A literature review and applied model. *The Sport Psychologist, 13,* 245-268.

Moore, J. B., Yin, Z., Hanes, J., Duda, J., Gutin, B., & Barbeau, P. (2009). Measuring enjoyment of physical activity in children: Validation of the Physical Activity Enjoyment Scale. *Journal of Applied Sport Psychology, 21*(1), S116- S129.

Morris, T., Spittle, M., & Watt, A. P. (2005). *Imagery in sport.* Champaign, IL: Human Kinetics.

Munroe, K. J., Giacobbi, P. R., Jr., Hall, C. R., & Weinberg, R. (2000). The four W's of imagery use: Where, when, why, and what. *The Sport Psychologist, 14,* 119-137.

Munroe-Chandler, K. J., & Gammage, K. L. (2005). Now see this: A new vision of exercise imagery. *Exercise and Sport Sciences Reviews, 33,* 201-205.

Munroe-Chandler, K. J., & Hall, C. R. (2005). Enhancing the collective efficacy of a soccer team through motivational general-mastery imagery. *Imagination, Cognition, and Personality, 24,* 51- 67.

Munroe-Chandler K. J., & Hall, C. R. (2015, in press). Imagery. In R. J., Schinke, K. R., McGannon, & B. Smith (Eds.), *The Routledge international handbook of sport psychology.* London: Routledge.

Munroe-Chandler, K. J., Hall, C. R., & Fishburne, G. J. (2008). Playing with confidence: The relationship between imagery use and self-confidence and self-efficacy in youth soccer players. *Journal of Sport Sciences, 26,* 1539- 1546.

Munroe-Chandler, K. J., Hall, C. R., Fishburne, G. J., Murphy, L., & Hall, N. D. (2012). Effects of a cognitive specific imagery intervention on the soccer skill performance of young athletes: Age group comparisons. *Psychology of Sport and Exercise, 13,* 324-331. doi:10.1016/j.psychsport.2011.12.006

Munroe-Chandler, K. J., Hall, C. R., Fishburne, G. J., & Shannon, V. (2005). Using cognitive general imagery to improve soccer strategies. *European Journal of Sport Sciences, 5*(1), 41- 49.

Munroe-Chandler, K. J., Hall, C. R., Fishburne, G. J., & Strachan, L. (2007). Where, when, and why young athletes use imagery: An examination of developmental differences. *Research Quarterly for Exercise and Sport, 78,* 103-116.

Munroe-Chandler, K. J. & Morris, T. (2011). Imagery. In T. Morris & P. C. Terry (Eds.), *The new sport and exercise psychology companion* (pp. 275-308). Morgantown, WV: Fitness Information Technology.

Nordin, S. M., & Cumming, J. (2008). Types and functions of athletes' imagery: Testing predictions from the applied model of imagery use by examining effectiveness. *International Journal of Sport and Exercise Psychology*, *6*, 189–206.

O, J., Munroe-Chandler, K. J., Hall, C. R., & Hall, N. D. (2014). Using motivational general-mastery to improve the self-efficacy of youth squash players. *Journal of Applied Sport Psychology, 26*(1), 66-81. doi: 10.1080/10413200.2013.778914

Office of the United Nations High Commissioner for Human Rights. Convention on the Rights of the Child. General Assembly Resolution 44/ 25 of 20 November 1989. Retrieved from www.ohchr.org/EN/ProfessionalInterest/Pages?CRC.aspx.

Oliver, M., Witten, K., Kearns, R. A., Mavoa, S., Badland, H. M., Carroll, P.,… Ergler, C. (2011). Kids in the city study: Research design and methodology. *BMC Public Health, 11,* 587. doi:10.1186/1471-2458-11-587.

Paivio, A. (1985). Cognitive and motivational functions of imagery in human performance. *Canadian Journal of Applied Sport Science, 10,* 22s- 28s.

Piaget, J. (2007). *The child's conception of the world: A 20th century classic of child psychology* (2nd ed.). Lanham, MD: Rowman & Littlefield.

Piaget, J., & Inhelder, B. (1971). *Mental imagery in the child.* New York, NY: Basic Books.

Raustorp, A., Pagels, P., Boldemann, C., Cosco, N., Soderstrom M., & Martensson, F. (2012). Accelerometer measured level of physical activity indoors and outdoors during preschool time in Sweden and the United States. *Journal of Physical Activity and Health, 9*(6), 801- 880.

Salmon, J., Hall, C. R., & Haslam, I. (1994). The use of imagery by soccer players. *Journal of Applied Sport Psychology, 6,* 116- 133.

Short, S. E., Afremow, J., & Overby, L. (2001). Using mental imagery to enhance children's motor performance. *Journal of Physical Education, Recreation, & Dance, 72*(2), 19- 23.

Stadulis, R. E., MacCracken, M. J., Eidson, T. A., & Severance, C. (2002). A children's form of the Competitive State Anxiety Inventory: The CSAI-2C. *Measurement in Physical Education and Exercise Science, 6*(3), 147- 165.

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology, 95,* 97- 110. Retrieved from http://dx.doi.org/10.1037/0022-0663.95.1.97

Steenbergen, B., Craje, C., Nilsen, D. M., & Gordon, A. M. (2009). Motor imagery training in hemiplegic cerebral palsy: A potentially useful therapeutic tool for rehabilitation. *Developmental Medicine and Child Neurology, 51*(9), 690- 696.

Taylor, A. M. (1970). *Imagery organization and children's recall.* Retrieved from http://search.proquest.com/docview/64345529?accountid=14789

Tobin, D., Munroe-Chandler, K. J., Hall, C. R., Guerrero, M. D., Shirazipour, C. H., & Cooke, L. M. (2015). *Examining the relationship between children's active play imagery and basic psychological needs.* Manuscript submitted for publication.

Tobin, D., Nadalin, E. J., Munroe-Chandler, K. J., & Hall, C. R. (2013). Children's active play imagery. *Psychology of Sport & Exercise, 14,* 371-378. doi:10.1016/j.psychsport.2012.12.007

Trochim, W. (2006). *Convergent and discriminant validity.* Retrieved from http://www.socialresearchmethods.net/kb/convdisc.php

Veitch, J., Salmon, J., & Ball, K. (2008). Children's active free play in local neighbourhoods: A behavioural mapping study. *Health Education Research,* 23, 870-879. doi:10.1093/her/cym074

Weiss, M. R. (1991). Psychological skill development in children and adolescents. *The Sport Psychologist, 5,* 335-354.

Weiss, M. R. & Smith, A. L. (1999). Quality of Youth Sport Friendships: Measurement development and validation. *Journal of Sport & Exercise Psychology, 21,* 145-166.

White, A., & Hardy, L. (1998). An in-depth analysis of the use of imagery by high level slalom canoeists and artistic gymnasts. *The Sport Psychologist, 12,* 387-403.

Williams, S. E., Cumming, J., Ntoumanis, N., Nordin-Bates, S. M., Ramsey, R., & Hall, C. (2012). Further validation and development of the movement imagery questionnaire. *Journal of Sport & Exercise Psychology, 34,* 621-646.

Witherspoon, L., & Manning, J. (2012). Active gaming: The future of play? *American Journal of Play, 4,* 464-487

FIGURES

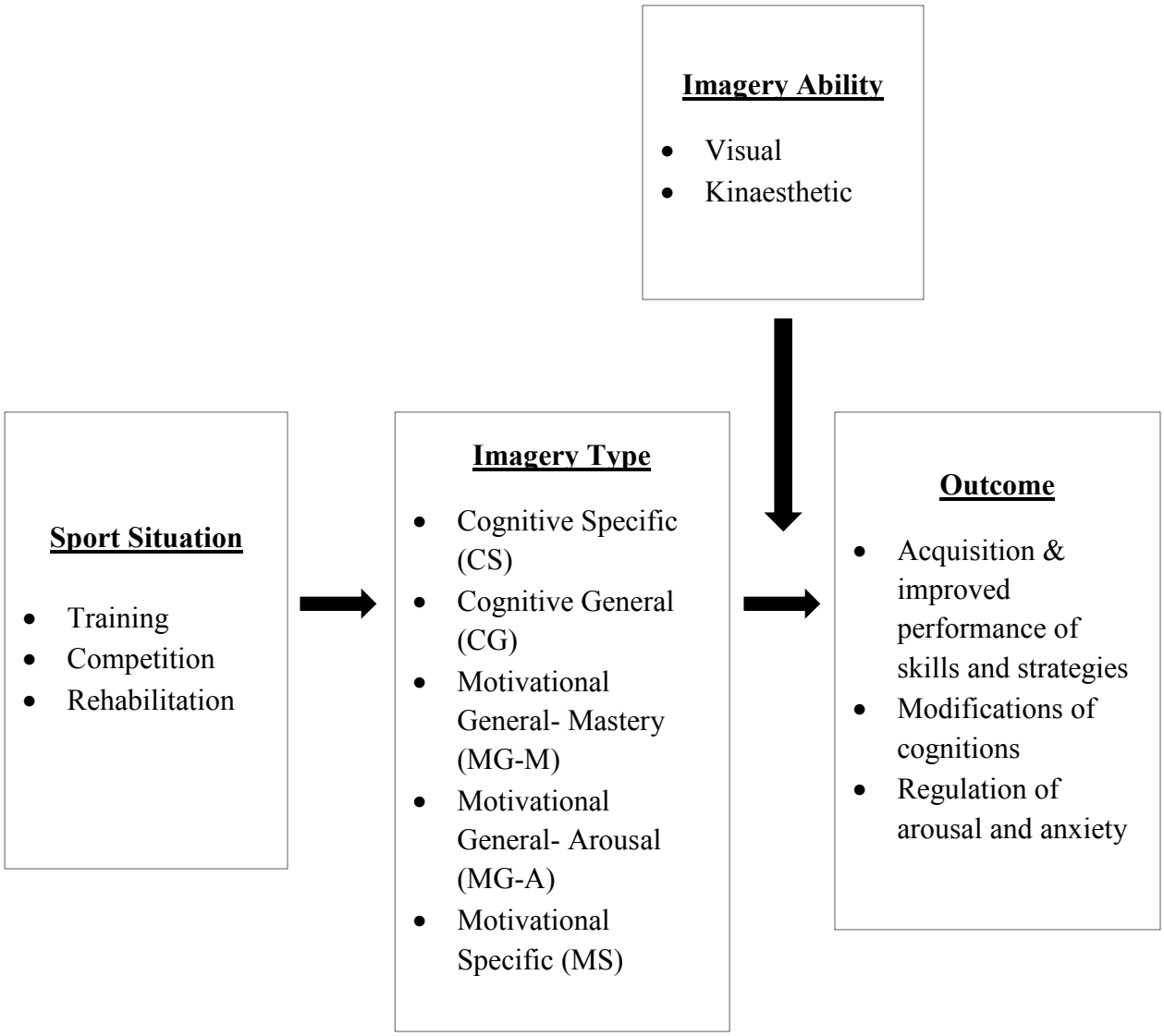

Figure 1. An applied model of mental imagery use in sport. Adapted from "Imagery Use in Sport: A Literature Review and Applied Model," by K. A. Martin, S. E. Moritz, and C. R. Hall, *The Sport Psychologist, 13,* p. 248.

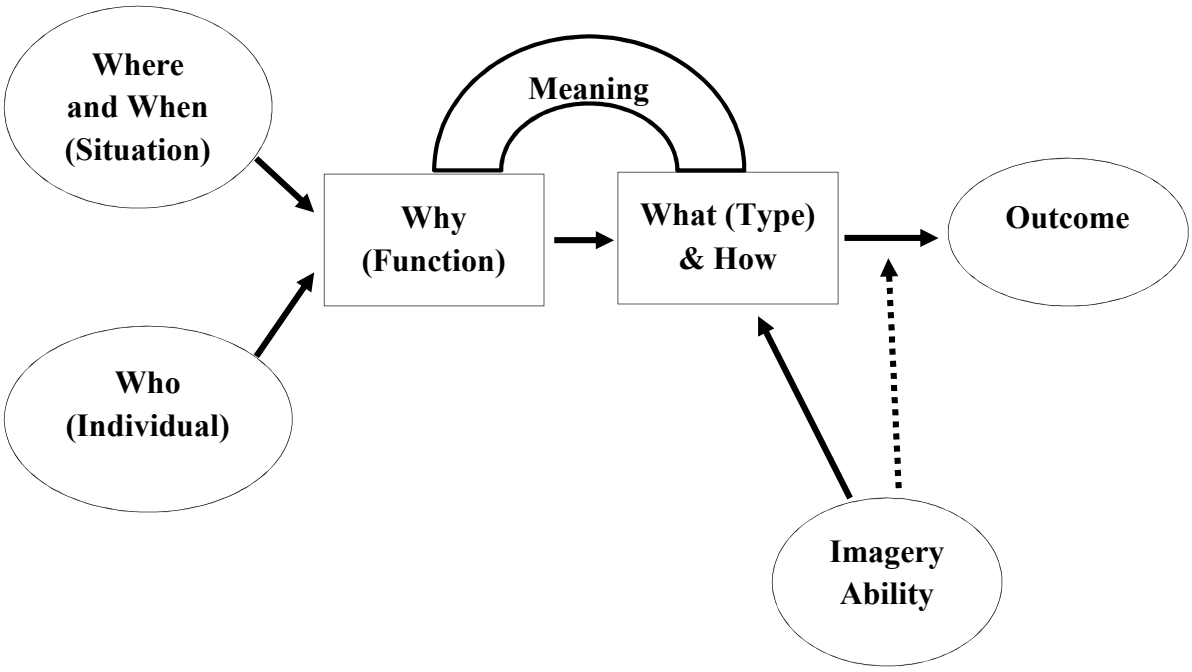

Figure 2. Revised applied model of deliberate imagery use. Adapted from "Introducing the revised applied model of deliberate imagery use for sport, dance, exercise, and rehabilitation" by J. Cumming, & S. E. Williams (2013), *Movement & Sport Sciences, 82*, p. 71.

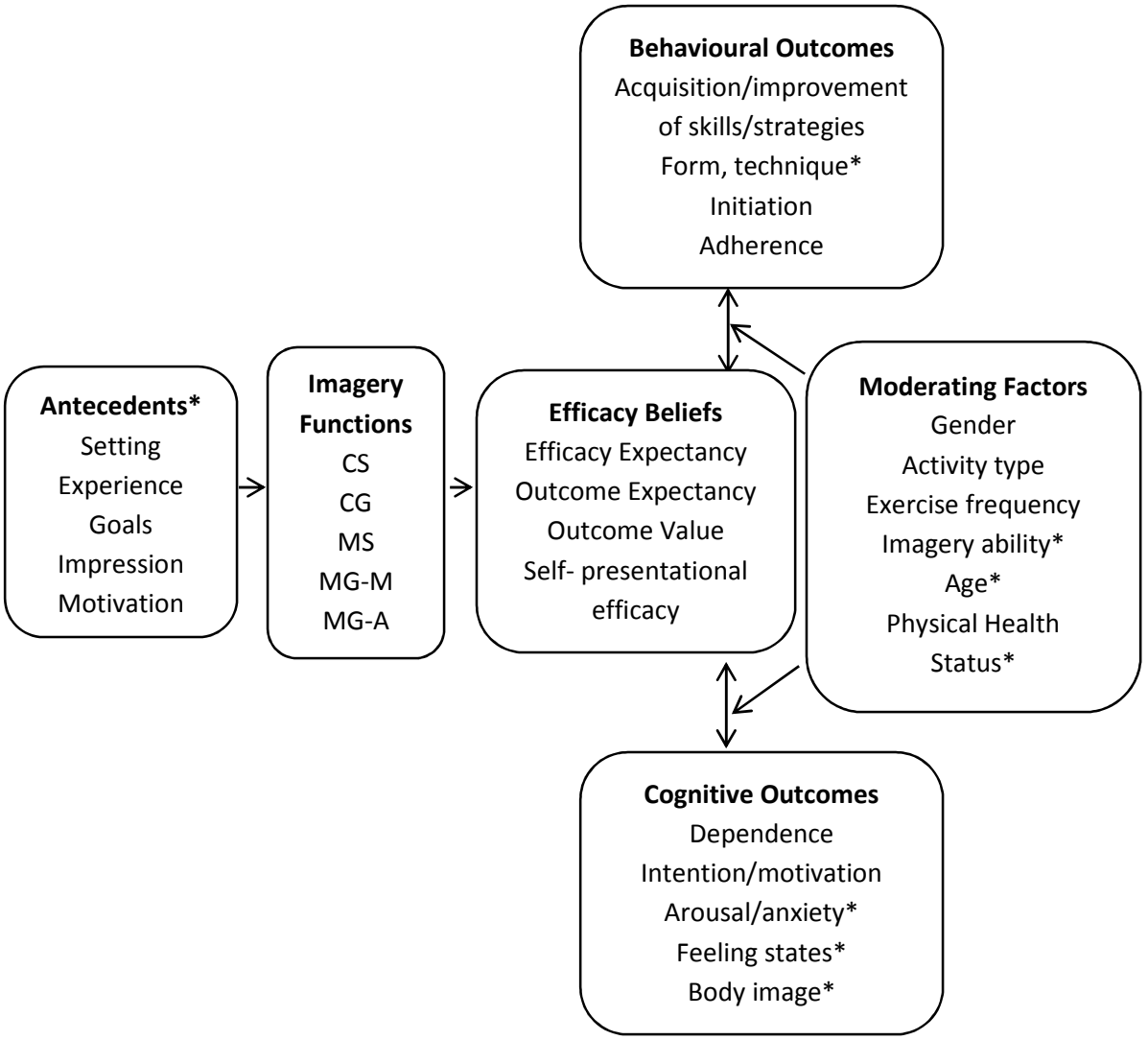

Figure 3. An applied model of imagery use in exercise. Adapted from "Now See This: A New Vision of Exercise Imagery" by K. J. Munroe- Chandler & K. L. Gammage (2005). *Exercise and Sport Sciences Reviews, 33*(4), p. 204. (* indicates hypothesized relationships).

APPENDICES

APPENDIX A

Demographic Questionnaire

Age: _____ Gender: Male _____ Female _____

School: _____

Grade: _____

Do you play an organized sport? YES NO

If yes, what sport do you play? _____

APPENDIX B

Children's Active Play Imagery Questionnaire

Directions:

When you picture things in your mind, this is called IMAGERY – like picturing your bedroom or where your desk is in your classroom. You can even use imagery to picture things when playing – like seeing yourself running fast in tag or imagining how your legs move when bike riding.

If you get your body moving and start to sweat when playing, this is called ACTIVE PLAY. Try to picture yourself doing active play – like going skating with your friends, playing soccer in your backyard, swimming, or going skiing. Remember, active play does **NOT** mean organized sport like playing on a hockey team or competing for a gymnastics club.

These questions ask how you use imagery (make pictures in your mind) when doing active play. Any question that sounds like something you do a lot should get a high number (5) or if it sounds like something you never do it should get a low number (1).

Remember the questions have to do with your **ACTIVE PLAY- play that gets your body moving- but not organized sport**. After you read the question circle a number that works for you. You can use a number more than once and there is no right or wrong answer.

Statement	Not at all	A little bit	Sometimes	Often	Very often
1. When thinking about active play, I imagine the moves that are needed.	1	2	3	4	5
2. When thinking about active play, I imagine joining in with others.	1	2	3	4	5
3. When thinking about active play, I picture myself having fun.	1	2	3	4	5
4. When thinking about active play, I imagine the positions of my body.	1	2	3	4	5
5. When thinking about active play, I see myself with my friends.	1	2	3	4	5
6. When thinking about active play, I imagine the fun I have.	1	2	3	4	5

7. When thinking about active play, I picture myself doing it in a group.	1	2	3	4	5
8. When thinking about active play, I imagine enjoying myself.	1	2	3	4	5
9. When thinking about active play, I imagine the movements that my body makes.	1	2	3	4	5
10. When thinking about active play, I imagine my friends with me.	1	2	3	4	5
11. When thinking about active play, I imagine how my body moves.	1	2	3	4	5

APPENDIX C

Sport Imagery Questionnaire for Children

Directions: Imagery is a mental skill that is used to create and recreate pictures in your mind. Athletes use imagery in practices and in competition. Imagery can be used to see different skills in your head and can also be used to help with your confidence and nervousness. This questionnaire measures how you are using imagery. Any statement that explains an imagery situation that you often use should be given a high number.

The statements will be scored from 1- 5. Please read each statement and then circle the number that most applies to you for that statement. Feel free to use a number more than once and remember- there are no right or wrong answers.

Not at all	A little bit	Sometimes	Often	Very Often
1	2	3	4	5

In my sport of _____ (pick one sport)

Statement	Not at all	A little bit	Sometimes	Often	Very Often
1. I make up new game plans or routines in my head.	1	2	3	4	5
2. I see myself doing my very best.	1	2	3	4	5
3. I imagine myself being confident in competition.	1	2	3	4	5
4. In my head, I imagine how calm I feel before I compete.	1	2	3	4	5
5. I see what I would do if my game plans or routines do not work out.	1	2	3	4	5
6. I imagine myself staying calm in competitions.	1	2	3	4	5
7. I imagine other people telling me that I did a good job.	1	2	3	4	5
8. I can usually control how a skill looks in my head.	1	2	3	4	5
9. I see the audience cheering for me.	1	2	3	4	5

10. When I think of doing my skill, I always see myself doing it perfectly.	1	2	3	4	5
11. I imagine continuing with my game plan or routine even if it is not going well.	1	2	3	4	5
12. When I think of a competition, I imagine myself getting excited.	1	2	3	4	5
13. Before trying a skill, I imagine myself doing it perfectly.	1	2	3	4	5
14. I see myself being mentally strong.	1	2	3	4	5
15. I imagine how exciting it is to be in a competition.	1	2	3	4	5
16. I see myself as a champion.	1	2	3	4	5
17. I see myself being focused in a tough situation.	1	2	3	4	5
18. When learning something new, I see myself doing it perfectly.	1	2	3	4	5
19. I see myself being in control in tricky situations.	1	2	3	4	5
20. I see myself following the game plan or routine at competitions.	1	2	3	4	5
21. I see myself getting through tough situations with good results.	1	2	3	4	5

APPENDIX D

Physical Activity Enjoyment Scale for Children

Please circle a number to rate how you feel *at the moment* about the physical activity you have been doing lately.

1=Disagree a lot, 2=Disagree, 3=Not sure, 4=Agree, 5=Agree a lot

When I am physically active……

	Disagree a lot	Disagree	Not sure	Agree	Agree a lot
1.I enjoy it	1	2	3	4	5
2. I feel bored	1	2	3	4	5
3. I dislike it	1	2	3	4	5
4. I find it pleasurable	1	2	3	4	5
5. It's no fun at all	1	2	3	4	5
6. It gives me energy	1	2	3	4	5
7. It makes me depressed	1	2	3	4	5
8. It's very pleasant	1	2	3	4	5
9. My body feels good	1	2	3	4	5
10. I get something out of it	1	2	3	4	5
11. It's very exciting	1	2	3	4	5
12. It frustrates me	1	2	3	4	5

13. It's not at all interesting	1	2	3	4	5
14. It gives me a strong feeling of success	1	2	3	4	5
15. It feels good	1	2	3	4	5
16. I feel as though I would rather be doing something else	1	2	3	4	5

APPENDIX E

Sport Friendship Quality Scale

The items below have to do with you and a person you consider to be your best friend *in sport*. This could be a friend on this team or someone on another team. We would like you to think *only* about this individual as you answer the questions. They are about what you and your friend may do or say with each other. Think of the best friend you have in sport. Write that person's first name or initials below.

My best friend in sport is: _____

Circle the answer below each statement that best includes how you feel about you and *the friend you named.*

Statement					
1. My friend gives me a second chance to perform a skill.	Not True at all	A little True	Somewhat True	Pretty True	Really True
2. My friend and I do fun things.	Not True at all	A little True	Somewhat True	Pretty True	Really True
3. My friend and I praise each other for doing sports well.	Not True at all	A little True	Somewhat True	Pretty True	Really True
4. I like to play with my friend.	Not True at all	A little True	Somewhat True	Pretty True	Really True
5. After I make mistakes my friend encourages me.	Not True at all	A little True	Somewhat True	Pretty True	Really True
6. My friend and I play well together.	Not True at all	A little True	Somewhat True	Pretty True	Really True
7. My friend and I spend time together.	Not True at all	A little True	Somewhat True	Pretty True	Really True
8. My friend has confidence in me during sports .	Not True at all	A little True	Somewhat True	Pretty True	Really True

APPENDIX F

Competitive State Anxiety Inventory for Children

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

	Not at all	Somewhat	Moderately so	Very much so
1. I am concerned that I may not play as well as I can today	1	2	3	4
2. My body feels tense	1	2	3	4
3. I feel self-confident	1	2	3	4
4. I feel tense in my stomach	1	2	3	4
5. I feel secure	1	2	3	4
6. I'm confident I can meet the challenge of play well today	1	2	3	4
7. I'm concerned that I will play poorly today	1	2	3	4
8. My heart is racing	1	2	3	4
9. I'm confident that I will play well today	1	2	3	4
10. I am worried about reaching my play goal	1	2	3	4
11. I feel my stomach sinking	1	2	3	4
12. I'm concerned that others will be disappointed with my play performance	1	2	3	4
13. I'm confident because, in my mind, I picture myself reaching my goal	1	2	3	4
14. I'm concerned about not being able to concentrate today	1	2	3	4
15. My body feels tight	1	2	3	4

APPENDIX G

Superintendent Recruitment Email

Dear (Superintendent)

My name is Jennifer Tomayer, I am a Master's student working under the supervision of Dr. Krista Chandler a professor at the University of Windsor in the Faculty of Human Kinetics. I am conducting a research study with the ultimate goal of increasing children's physical activity levels. Given the decline in physical activity among children, often leading to obesity, it is important to find innovative strategies to increase levels of active play. The current study is looking at the validation of the Children's Active Play Imagery Questionnaire (CAPIQ), a measure of imagery (visualization; the pictures we create in our mind) during children's active play experiences. The validation of the CAPIQ will aid future studies in gathering a better understanding of children's active play imagery and aiding interventions targeting active play.

Although the data collection would not begin until the winter 2015, we are seeking your permission to recruit approximately 150 students in grades 4-8 (ages 9- 14) to participate in the study. Participation is completely voluntary and participants can drop out at any time without any consequence. There is, however, an incentive for those who agree to participate (enter a draw for a chance to win a Sport Chek Gift card). Once a child agrees to participate, and consent has been given by the student's parent/guardian, we would ask to meet with the student once, for 15- 20 minutes, at a time agreed upon by both the school and the researcher. During this time the student will complete a questionnaire packet containing five questionnaires. Unless requested by the teacher, we will not be meeting with the student during class times and do not foresee that participation in the study will interfere with their school work. However, depending on the level of participation in any given class, it could provide for some practical discussions regarding health and activity in the classroom. There are no risks associated with participating in this study. We have received ethical approval for this study from the University of Windsor Research and Ethics Board.

Identifying the correlates of imagery use by children aged 9 –14 during active play will be important in future interventions directed towards improving the physical activity levels among children and youth aged 9- 14. Validation of the Children's Active Play Imagery Questionnaire will aid future studies in this endeavour.

If you have any questions please do not hesitate to contact me or Dr. Krista Chandler.

Thank you,

Jennifer Tomayer
For
Dr. Krista Chandler
401 Sunset Avenue
Faculty of Human Kinetics
The University of Windsor
Windsor, Ontario
N9B 3P4
Ph: 519-253-3000 ext 2446
Email: chandler@uwindsor.ca

APPENDIX H

Principal Recruitment Email

Dear (Principal's Name),

My name is Jennifer Tomayer and I am a graduate student at the University of Windsor in the Department of Kinesiology working under the supervision of Dr. Krista Chandler. I am emailing you on behalf of myself and my supervisor, Dr. Krista Chandler. We have received approval from the Superintendent(s) from your School Board and the University of Windsor to recruit students from local schools. This research aims to increase the physical activity levels of children aged 9 -14 (grades 4-8). We are seeking your permission to recruit students in grades 4-8 from your school in the winter of 2015.

Attached to this email you will find a brief overview of the study. If you have any problems opening the word document, please let me know and I will place the text directly into a subsequent email.

If you would prefer, we would be delighted to speak with you in person or possibly speak to the class (classes) about the study thus making it an attractive learning experience for the students.

We look forward to your reply.

Warmest regards,

Jennifer Tomayer,

tomayer@uwindsor.ca; (519)253- 3000 ext. 4058

Dr. Krista Chandler,

chandler@uwindsor.ca; (519)253- 3000 ext. 2446.

APPENDIX I

PARENT/ GUARDIAN LETTER OF INFORMATION

Title of Study: Validating the Children's Active Play Imagery Questionnaire

Your child is being asked to participate in a research study conducted by Jennifer Tomayer under the supervision of Dr. Krista Chandler, from the Department of Kinesiology at the University of Windsor**.** Results obtained from this study will contribute to the completion of a Master's degree in the Faculty of Human Kinetics.

If you have any questions or concerns about the research, please feel to contact Dr. Krista Chandler at (519) 253- 3000 ext. 2446 or via email at chandler@uwindsor.ca or Jennifer Tomayer at (519) 253- 3000 ext. 4058 or via email at tomayer@uwindsor.ca.

PURPOSE OF THE STUDY

The proposed research aims to validate the Children's Active Play Imagery Questionnaire.

PROCEDURES

If you volunteer your child to participate in this study:

Your child will be asked to meet the researcher once during their lunch period to complete several questionnaires (approximately 15-20 minutes). The first questionnaire will assess children's imagery during active play (11 items). The second questionnaire will assess how friends encourage and provide support for one another as well as how well they get along (8 items). The third questionnaire will assess how you feel when playing sport (15 items). The fourth questionnaire will assess a child's enjoyment during physical activity (16 items). The final questionnaire will assess the use of imagery during sport (21 items).

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with taking part in this study. The questionnaires that will be administered have been employed in the past with children and we have received no indication of any reported discomfort.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

There is no personal benefit from participation in this project. However, validating the measure is important for future research examining active play. Moreover, identifying the correlates of imagery use by children aged 7 – 14 during active play will be important in future interventions directed towards improving the physical activity levels among children and youth aged 7- 14.

COMPENSATION FOR PARTICIPATION

Participants will be eligible to enter a draw to win one of four $ 25 gift certificates to Sports Chek. Participants will receive a ballot for a chance to enter the draw when they receive the

questionnaire package to be filled out and returned into a ballot box upon completion. Once all ballots have been submitted there will be a draw for the chance to win one of four gift certificates to Sports Chek.

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. Responses to the questionnaires cannot guarantee anonymity due to the nature of submitting written questionnaires. All responses from questionnaires will be kept in strict confidentiality. However, the only exception is if a participant indicates to the investigator that they are being hurt or abused. The investigator will then report this information to the appropriate service. The information obtained in this study will not be used for any purpose other than the research and communication of the results. The information from the draw will remain confidential. Potentially the data may also be utilized in subsequent studies conducted by the researchers. Data will be kept secured for five years when it will then be destroyed.

PARTICIPATION AND WITHDRAWAL

Participation in this study is voluntary and supplementary there are no consequences for your child if they do not wish to participate. You may withdraw your child at any time prior to submission of the questionnaires. Your child may withdraw any time during the completion of the questionnaires, without any consequences. However, once your child's questionnaires have been completed and submitted this will be accepted as your child's assent to participate and it will not be possible to withdraw because the questionnaires are anonymous once submitted. The investigator may withdraw your child from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

If you wish to receive any additional information regarding this research, please contact the researchers via e-mail (tomayer@uwindsor.ca or chandler@uwindsor.ca). The results from this research will be available on the REB study results website upon completion.

Web address: www.uwindsor.ca/reb)
Date when results are available: August 31, 2015

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

APPENDIX J

PARENT/ GUARDIAN CONSENT FORM

Title of Study: Validating the Children's Active Play Imagery Questionnaire

Your child is being asked to participate in a research study conducted by Jennifer Tomayer under the supervision of Dr. Krista Chandler, from the Department of Kinesiology at the University of Windsor**.** Results obtained from this study will contribute to the completion of a Master's degree in the Faculty of Human Kinetics.

If you have any questions or concerns about the research, please feel to contact Dr. Krista Chandler at (519) 253- 3000 ext. 2446 or via email at chandler@uwindsor.ca or Jennifer Tomayer at (519) 253- 3000 ext. 4058 or via email at tomayer@uwindsor.ca.

PURPOSE OF THE STUDY

The proposed research aims to validate the Children's Active Play Imagery Questionnaire.

PROCEDURES

If you volunteer your child to participate in this study:

Your child will be asked to meet the researcher once during their lunch period to complete several questionnaires (approximately 15-20 minutes). The first questionnaire will assess children's imagery during active play (11 items). The second questionnaire will assess how friends encourage and provide support for one another as well as how well they get along (8 items). The third questionnaire will assess how you feel when playing sport (15 items). The fourth questionnaire will assess a child's enjoyment during physical activity (16 items). The final questionnaire will assess the use of imagery during sport (21 items).

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with taking part in this study. The questionnaires that will be administered have been employed in the past with children and we have received no indication of any reported discomfort.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

There is no personal benefit from participation in this project. However, validating the measure is important for future research examining active play. Moreover, identifying the correlates of imagery use by children aged 7 – 14 during active play will be important in future interventions directed towards improving the physical activity levels among children and youth aged 7- 14.

COMPENSATION FOR PARTICIPATION

Participants will be eligible to enter a draw to win one of four $ 25 gift certificates to Sports Chek. Participants will receive a ballot for a chance to enter the draw when they receive the questionnaire package to be filled out and returned into a ballot box upon completion. Once all

ballots have been submitted there will be a draw for the chance to win one of four gift certificates to Sports Chek.

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. Responses to the questionnaires cannot guarantee anonymity due to the nature of submitting written questionnaires. All responses from questionnaires will be kept in strict confidentiality. However, the only exception is if a participant indicates to the investigator that they are being hurt or abused. The investigator will then report this information to the appropriate service..The information obtained in this study will not be used for any purpose other than the research and communication of the results. The information from the draw will remain confidential. Potentially the data may also be utilized in subsequent studies conducted by the researchers. Data will be kept secured for five years when it will then be destroyed.

PARTICIPATION AND WITHDRAWAL

Participation in this study is voluntary and supplementary there are no consequences for your child if they do not wish to participate. You may withdraw your child at any time prior to submission of the questionnaires. Your child may withdraw anytime during the completion of the questionnaires, without any consequences. However, once your child's questionnaires have been completed and submitted this will be accepted as your child's assent to participate and it will not be possible to withdraw because the questionnaires are anonymous once submitted. The investigator may withdraw your child from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

If you wish to receive any additional information regarding this research, please contact the researchers via e-mail (tomayer@uwindsor.ca or chandler@uwindsor.ca). The results from this research will be available on the REB study results website upon completion.

Web address: www.uwindsor.ca/reb)
Date when results are available: August 31, 2015

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

I have read the Letter of Information, have had the nature of the study explained to me and I agree to allow my child to participate. All questions have been answered to my satisfaction.

Consenting Signature:

Participant's Name (Child's name) (print): _____

Parent or Guardian Name (print): _____

Parent or Guardian Signature: _____

Date: _____

Researcher Name (print): _____

Researcher's Signature _____

Date: _____

APPENDIX K

University of Windsor

CHILDREN'S ASSENT FORM

I am a student researcher, and I would like to learn about 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. I would also like to learn about the pictures you create in your mind when you are playing sports, the amount of fun you have during physical activity both playing sports and during active play, and how you picture your friends during active play and while playing sports. When we meet, I will give you some pieces of paper with questions I would like you to answer. These questions will help me learn more about the pictures you create in your mind when you are playing.

I want you to know that I will not be telling your teachers or parents or any other kids what you answer. The only time I would tell someone else is if you tell me that someone has been hurting you. If I think that you are being hurt I will need to tell someone else who can help you. Otherwise, I promise to keep everything that you tell me to myself.

Your parents are aware that I'm speaking to you. Do you think that you would like to answer my questions? You won't get into any trouble if you say "no". There will be no punishment if you do not want to be in this study. If you don't want to be in the study, just say so. Even if you say yes now, you can still change your mind later. If there is a question you don't want to answer you don't have to. You will still stay in the study. Would you like to do this?

I understand what I am being asked to do to be in this study, and I agree to be in this study.

_____ _____

Signature Date

_____

Witness

APPENDIX L

RECRUITMENT SCRIPT TO PARENTS

Hello, my name is Jennifer Tomayer and I am a Master's student in the department of Kinesiology working under the supervision of Dr. Krista Chandler a Professor at the University of Windsor. I am conducting a study validating the Children's Active Play Imagery Questionnaire. Clearance to conduct this research study has been received from the University of Windsor Research Ethics Board and the School Board/school principal of your child's school.

I want to request your permission for your child to participate in our study. The goal of the study is to provide valid evidence for the use of the Children's Active Play Imagery Questionnaire in determining imagery use as a motivator to help engage children in physical activity during their leisure-time. Your child will meet with me during their lunch period at school to fill out a package of questionnaires which will take approximately 15-20 minutes to complete. If your child chooses to participate in the study they will be eligible to enter a draw for one of four $25 gift certificates from Sport Chek for their participation.

Thank you for your time.

Sincerely,

Jennifer Tomayer

APPENDIX M

Children's Re-Assent Form

Validating the Children's Active Play Imagery Questionnaire

Your name: _____

Date: _____

1. Do you still want to answer my questions on the pictures you create in your mind about active play?

YES **NO**

I want to let you know that you won't get into any trouble if you say "no". If you don't want to be in the study, just say so. Even if you say yes now, you can change your mind later. If there is a question you don't want to answer you don't have to. You will still remain in the study.

VITA AUCTORIS

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