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CHILDREN'S USE OF ACTIVE PLAY IMAGERY

by

Eric J. Nadalin

A Thesis

Submitted to the Faculty of Graduate Studies
through the Faculty of Human Kinetics
in Partial Fulfillment of the Requirements for
the Degree of Master of Human Kinetics at the
University of Windsor

Windsor, Ontario, Canada

2011

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DECLARATION OF ORIGINALITY

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ABSTRACT

In a recent report, Canadian children received an overall “F” grade in Physical Activity Level (AHK, 2010). Contributing to this failing grade is a lack of time spent engaging in physically active play. As imagery has proven to be an effective motivational tool in the exercise setting (e.g., Hausenblas et al., 1999), the present study sought to qualitatively investigate children’s use of active play imagery. Using self-determination theory as a motivational framework, gender differences were also examined. One hundred and four children aged 7-14 years ($n= 48$ male; $n= 56$ female) participated in focus group discussions guided by three basic psychological needs (i.e., autonomy, competence, and relatedness) proposed within basic needs theory (Deci & Ryan, 2000). Thematic analysis resulted in three hierarchical trees revealing children’s use of active play imagery as it satisfies the three basic needs. Several gender differences were also noted at the lower levels of analysis.

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RESEARCH ARTICLE

Introduction

Recent reports from Active Healthy Kids Canada (AHK; 2010) and the Canadian Fitness and Lifestyle Research Institute (CFLRI; 2009) have identified the increasing prevalence of sedentary lifestyles among Canadian children. As physical activity during childhood has been associated with numerous physical and psychological benefits, research has begun to focus on ways in which to increase children's physical activity levels (AHK, 2010). Although there are many forms of physical activity (i.e., leisure-time, occupational, and commuting), leisure-time physical activity has been the most extensively examined as it is the most self-directed and susceptible to change (Kujala, Kaprio, Sarna, & Koskenvuo, 1998; Laaksonen et al., 2002; Lakka et al., 1994; Martinez et al., 1997; Wang et al., 2010). Notably, leisure-time physical activity for children may be either structured (e.g., organized sport) or unstructured (e.g., active play) (Veitch, Salmon, & Ball, 2008).

Unstructured forms of physical activity specifically, active play, may be a viable opportunity for children to accumulate the recommended daily levels of physical activity as AHK recommended that at least half of children's physical activity come in the form of unstructured sessions of active free play. Active play has been defined as "unstructured physical activity that takes place outdoors in a child's free time" (Veitch et al., 2009, p. 870). Although active play may take place indoors or outdoors, outdoor active play was emphasized in the aforementioned definition as it provides children a greater opportunity to develop a sense of independence from parents (Ginsberg, 2007). Noted benefits of active play include the distinct contributions to children's cognitive,

physical, social, and emotional development (Burdette & Whitaker, 2005). Given the known benefits of an active lifestyle (AHK, 2010) and the belief that a sedentary childhood could lead to a sedentary adulthood (Perry et al., 1990), it is important to identify factors which may encourage children to participate in active play during their free time. One such factor may be imagery (Hall, 1995, 2001), which White and Hardy (1998) define 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)

Contemporary imagery research has stemmed from Paivio's (1985) and later Hall, Mack, Paivio, and Hausenblas' (1998) research outlining five types of imagery: cognitive general (CG; imagining behavioural strategies used to achieve some performance goal); cognitive specific (CS; mental rehearsal of specific motor skills); motivational general-arousal (MG-A; imagining affect or arousal states associated with performance); motivational general-mastery (MG-M; images of being mentally tough, confident, and in control of the performance situation); motivational specific (MS; imagining the achievement of specific goals or goal-oriented behaviour). Research with adult athletes revealed positive associations between imagery use and aspects of performance (Hall, 2001), acquisition of new skills (Hall, Schmidt, Durand, & Buckolz, 1994), and concentration (White & Hardy, 1998). In light of the promising findings with adult athletes, researchers began to investigate the use of imagery by children in sport yielding positive associations with self-efficacy (Munroe-Chandler, Hall, & Fishburne,

2008), collective efficacy (Munroe-Chandler & Hall, 2004), and self-confidence (Strachan & Munroe-Chandler, 2006).

In a qualitative study examining young (7-14 years) athletes' use of imagery, Munroe-Chandler, Hall, Fishburne, and Strachan (2007) found that all athletes, regardless of gender and age, used imagery in training and competition sessions. Moreover, regardless of age, all athletes reported using each of the five types of imagery as outlined by Hall et al. (1998). However, there were gender differences in that males did not report using images related to arousal and anxiety (MG-A) or mental toughness and confidence (MG-M). The authors suggested this may have been due to the presence of social desirability bias as male athletes may not have been comfortable describing their experiences of managing their anxiety within the focus group setting. The specific sports (gymnastics and dance) in which the female athletes engaged may have also contributed to their reported use of MG-M and MG-A imagery (Munroe-Chandler et al., 2007). It is possible that these types of activities invoke greater feelings of anxiety and arousal due to their individual nature when compared to other activities such as soccer and volleyball, which were represented more by the male athletes. With respect to the younger age cohorts (7-10 years), males did not report using images related to skill execution (CS), which the authors attributed to the this age group's lack of sufficient information processing skills, as more controlled and conceptual images were reported by younger females and in all older age cohorts.

Recent research using the Sport Imagery Questionnaire for Children (SIQ-C; Hall, Munroe-Chandler, Fishburne, & Hall, 2009) found that children aged 7-14 used all five types of imagery, thus supporting Munroe-Chandler et al.'s (2007) qualitative findings.

In addition, children reported using the motivational types of imagery most frequently (e.g., MG-M), in support of previous imagery research with adults (Hall et al., 1998; Munroe, Hall, Simms, & Weinberg, 1998). Though in contrast to Munroe-Chandler et al.'s (2007) findings, gender differences were not found when using the SIQ-C to examine young athletes' use of imagery (Hall et al., 2009).

Given the support for the motivational role of imagery in the sport domain, Hall (1995, 2001) suggested that imagery may serve as a useful psychological skill for adults to employ for motivation in the exercise setting (i.e., leisure-time physical activity). Research with adult exercisers found that exercisers reported using imagery for both motivational and cognitive functions (Giacobbi, Hausenblas, Fallon, & Hall, 2003; Hausenblas, Hall, Rodgers, & Munroe, 1999). Subsequent research (Wilson, Rodgers, Hall, & Gammage, 2003) demonstrated the association between aspects of exercise imagery and exercise motivation using a self-determination theory framework (SDT; Deci & Ryan, 2000, 2002; Ryan & Deci, 2000).

SDT is often used as the theoretical basis for studies examining exercise participation motives (Hagger & Chatzisarantis, 2007) given its description of the extent to which behaviours are autonomous (i.e., self-determined). SDT is one of the most commonly cited theories of motivation in behavioural psychology research, and posits that motivation varies along a regulatory continuum anchored at one end by purely intrinsic motives (i.e., those behaviours that are engaged in out of inherent interest or enjoyment) representing the most autonomous forms of behaviour, and at the other end by amotivation, which represents a lack of motivation to engage in a behaviour (Deci &

Ryan, 2000). The middle of the continuum consists of four types of extrinsic motivation portraying various levels of autonomy.

SDT is by nature, a meta-theory, one of which is basic needs theory (BNT). BNT is distinct in that it is directed towards those behaviours and environments which facilitate internalization and intrinsic motivation through the satisfaction of the needs for autonomy, competence, and relatedness. Deci and Ryan (2000) described these needs as “innate psychological nutriment that are essential to ongoing psychological growth, integrity, and well-being” (p. 229). When these needs are supported, internalization and intrinsic motivation are facilitated (Deci & Ryan, 2007). Autonomy refers to being the perceived origin or source of one’s own behaviour; that is, behaviours that are valued by the individual and engaged in out of expression of the self are considered to be autonomous (Deci & Ryan, 2002). Competence refers to feelings of effectiveness in association with an individual’s interaction with the social environment, and in experiencing opportunities to exemplify confidence in one’s global capacity (Deci, 1975; Deci & Ryan, 2002). Relatedness refers to having a sense of belonging and connection to other individuals and is reflected in the tendency to feel integral and connected to the lives of others (Deci & Ryan, 2002).

The examination of BNT in the adult sport domain has demonstrated the positive influence of need supportive coaching behaviours on the satisfaction of the basic psychological needs and subsequently, well-being (Adie, Duda, & Ntoumanis, 2008; Reinboth, Duda, & Ntoumanis, 2004). More specifically, Adie et al. sought to examine whether need support would increase well-being regardless of the demographic examined (Deci & Ryan, 2000). A large sample of male and female adult athletes participating in a

diverse range of team sports was examined. The results supported the proposed sequence of autonomy support, need satisfaction, and well-being (via subjective vitality); yet only partial support could be offered for gender invariance (i.e., three of the hypothesized relations were significant for either one gender or the other).

Within the context of youth sport, need supportive parenting and coaching styles were found to increase intrinsic motivation to participate in practice through the need for autonomy, and perceived well-being after practice was predicted by the need satisfaction experienced during practice (Gagné, Ryan, & Bargmann, 2003). More recently, Coatsworth and Conroy (2009) tested a model of coaching on youth development and found autonomy supportive coaching behaviours to satisfy the basic psychological needs of competence and relatedness, which indirectly influenced self-esteem and the positive developmental outcomes (i.e., initiative and identity reflection).

As organized youth sport is the predominant mode by which children engage in physical activity (AHK, 2010), the abovementioned findings have important practical implications for enhancing intrinsic motivation for prolonged engagement in these activities. However, a modest body of literature has also examined BNT within the context of motivation for engagement in children's leisure-time physical activity, of which unstructured active play is a component. As active play is freely chosen and under the control of the individual, SDT should prove to be useful in describing the process by which an individual may be motivated to engage in these behaviours.

Research investigating the applicability of SDT as a framework of the motivational processes underlying leisure-time physical activity engagement in adults (i.e., purposeful exercise) has established the positive influence of need satisfaction on

self-determined motivation (Kowal & Fortier, 2000). In addition, participation in a 12-week exercise program led to need satisfaction and as a result, increased participants' exercise attitudes and behaviours (Wilson, Rodgers, Blanchard, & Gessell, 2003), as well as perceived well-being and positive affect in the exercise setting (Wilson, Rodgers, Murray, Longley, & Muon, 2006).

BNT research with children has primarily been conducted in the domain of school-based physical education (e.g., Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Ntoumanis, 2001; Shen, McCaughy, & Martin, 2007; Standage, Duda, & Ntoumanis, 2003). Hagger et al. found a direct association between perceived autonomy support on intrinsic motivation for leisure-time physical activity in 13-16 year old students. Standage et al. investigated need satisfaction in the physical education environment and intention to engage in leisure-time physical activity for secondary school students. The results revealed that a perceived autonomy-supportive physical education setting fostered satisfaction of all three needs which in turn were found to predict intrinsic motivation via their intention to engage in leisure-time physical activity.

Based on the aforementioned studies, support for promoting a need supportive environment in increasing unstructured and structured leisure-time physical activity motivation for adults and children is evident (Hagger et al., 2003; Kowal & Fortier, 2000; Standage et al., 2003; Wilson et al., 2003; Wilson, Rogers, Rodgers, & Wild, 2006), however there is a dearth of research which exclusively examines active play behaviours with children. As such it is important to identify factors which may satisfy the needs for autonomy, relatedness, and competence as they relate to active play in order to fully understand the factors which may lead to increased participation in these activities.

Recently, Hall, Rodgers, Wilson, and Norman (2010) examined the relation of exercise imagery and self-determined motivation. The findings indicated that images relating to energy and technique (e.g., looking more fit or imagining oneself performing the exercise correctly) were associated with more self-determined forms of motivation (i.e., identified and intrinsic motivation) and imagery use was unrelated to amotivation and external motivation amongst regular exercisers and those intending to exercise. Hall et al. (2010) concluded that imagery may be a useful intervention for those people already exercising or intending to begin an exercise program. These results lend support to the use of SDT as a framework from which to guide subsequent imagery research.

As imagery is inherently self-determined, and has been found to be a natural skill for children (Weiss, 1991), it may serve to satisfy children's basic psychological needs proposed by Deci and Ryan (2000). Moreover, imagery has demonstrated a positive association with several variables related to need satisfaction (i.e., self-determined motivation, self-efficacy, self-confidence, and cohesion, Hardy, Hall, & Carron, 2003; Munroe-Chandler et al., 2008; Strachan & Munroe-Chandler, 2006; Wilson et al., 2003) as well as being noted as a potential motivator for leisure-time physical activity (i.e., exercise) engagement in adults (Hall, 2001; Munroe-Chandler & Gammage, 2005). As such, the purpose of this study was to investigate the general nature of active play-related imagery as it satisfies the basic psychological needs of autonomy, relatedness, and competence in children. Moreover, in light of the gender differences previously noted in child athletes' use of imagery (Munroe-Chandler et al., 2007), gender will be of particular interest in this examination.

Method

Participants

Participants were 104 ($n = 48$ male; $n = 56$ female) children between 7 and 14-years old from two southwestern Ontario university summer camps. Participants were involved in a variety of sport and technology related camps including basketball, volleyball, football, soccer, sport performance, multi-sport, robotics, and web design.

Design

A total of 23 focus groups were conducted with three to nine participants per group and efforts made to ensure homogeneity in age and gender within groups. It has been stated that children vary in their experiences, socialization, and interests based on age, and that children are more comfortable sharing their opinions with same-sex peers (Krueger & Casey, 2000). Focus groups are “a discussion involving a small group of participants, led by a moderator that seeks to gain an insight into the participants’ experiences, attitudes, or perceptions” (Hennessy & Heary, 2005, p. 236). An interview guide approach (Patton, 1990) was used in order to focus on the three basic psychological needs purported by BNT as it relates to imagery in active play (Appendix A). In particular, participants were asked about their use of autonomy, competence, and relatedness images pertaining to their active play (e.g., “When you picture yourself playing, who do you see yourself with?”). Focus groups lasted between 45-60 minutes in accordance with suggestions from Krueger and Casey for conducting focus groups with children.

Procedure

After receiving ethics approval from the research ethics boards of both data collection sites, approval was sought from university summer camps coordinators to

conduct focus groups with their campers. Campers and parents were approached during designated sign-in/sign-out times and informed of the purpose and nature of the study and focus groups design. The parents of those who agreed to participate were provided with a Parent/Guardian Letter of Information for Consent to Participate in Research form (Appendix B) and a date and time for their child's focus group session. Focus groups consisted of the participants, a moderator (a graduate student), and an assistant moderator (an undergraduate research assistant with experience working with children and who was responsible for technical setup of recording materials and note taking). The moderator was experienced in working with children, had been given specific methodological guidance in conducting focus groups, and had conducted an extensive literature review relating to focus groups with children in order to ensure credibility throughout the data collection process. Participants were asked to sign a participant Assent Form (Appendix C) which was verbally dictated to them by the moderator prior to the discussion.

The interview guide began with a welcome and introduction, a description of what was to take place during the discussion, guidelines for how to behave and share appropriately, a description of the role of the moderator and assistant moderator, an overview of the topic, the three key questions assessing autonomy, competence, and relatedness, and a summary of the themes which emerged from the discussion. Given the age of the sample, a simple imagery definition was provided: “[a mental skill that is used to] create or recreate pictures [and feelings] in your mind” (Vealey & Greenleaf, 2006, p. 307). Moreover, specific probes were used throughout the discussion in order to prompt elaboration on vague answers/comments. Each focus group was then transcribed verbatim by the moderator.

Data Analyses

Analysis followed suggestions from Braun and Clark (2006), in which they outline six phases through which to conduct thematic analysis. The primary investigator became familiar with the data set through the transcription process and thorough review of the resulting transcripts. Initial codes were then generated using a hand coding technique and transcripts were imported into the QSR NVivo9 software package (QSR International, 2010) for further analysis. As the questions from the interview guide were theoretically driven by the tenets of BNT, text units collected through the focus group discussions were grouped (i.e., coded) deductively into broad categories and subcategories (i.e., higher and lower level themes) based on the three basic psychological needs of autonomy, competence, and relatedness. Additional themes emerging from the focus groups were classified inductively as lower level themes within the existing framework (Charmaz, 2000; Patton, 1990). Themes emerging from these analyses were then named and defined, and a final report was produced outlining the general nature of active play imagery used by children. Lastly, themes were compared and contrasted to examine gender differences.

Trustworthiness and Validity Procedures

A pilot study was conducted prior to data collection with a small group ($n = 5$) of 9-10 year old girls in order to ensure the validity of the interview guide and focus group design. In accordance with Krueger and Casey's (2009) recommendation that focus groups with children/youth should last no longer than 60 minutes, the interview guide was deemed to be appropriate in length. Ecological validity was ensured (i.e., the pilot study participants were representative of the actual participants in the study) through the

recruitment of participants who were unfamiliar to the research team and within the same age range as those participating in the actual investigation (Brewer, 2000). Following the pilot study, a debriefing session occurred wherein slight modifications were made to the moderator's style of questioning in order to ensure that the questions were asked in more open-ended manner. In addition, the assistant moderator's note taking procedures were modified in order to account for non-verbal behaviours to be taken into account during the coding process as they may have influenced the verbal dialogue which had been audio-recorded. Overall, the participants in the pilot study adequately grasped the topics being discussed and were able to provide commentary regarding imagery use during active play and therefore data collection proceeded, however data collected from the pilot study was not included in subsequent analyses.

To further enhance the trustworthiness of the collected data, 20% of the transcribed focus groups coded by the primary investigator were compared to those coded by an expert in the field, (a graduate student with expertise in imagery and BNT) yielding a 96% agreement between the two researchers. As a percentage agreement greater than 85% is considered "good" agreement (MacQueen, McLellan-Lemal, Bartholow, & Milstein, 2008), the coding process was deemed trustworthy. Where disagreements occurred over the categorization of specific text units, the researchers each provided rationale for their decision until a consensus was reached. Debriefing sessions and collaboration between researchers at both data collection sites were conducted throughout data collection and analysis in order to achieve triangular consensus of emerging themes between investigators (Patton, 2002). Specifically, the moderator and assistant moderator conducted debriefing sessions upon completion of each focus group discussion in order to

ensure that the contents of the discussion were adequately captured through the audio-recording and note taking which took place during the session. In addition, researchers from both data collection sites collaborated in the development of the interview guide and throughout the analysis. Lastly, the final stage of each focus group discussion consisted of the moderator providing a summary of the participants' commentary throughout the discussion. Participants were asked if the information in the summary was accurate and were invited to comment on any topics previously discussed that had not been adequately captured.

Results

Thematic analysis revealed all participants reported using imagery during active play relating to the three basic psychological needs posited in BNT (Deci & Ryan, 2000), with several commonly reported images emerging inductively as lower level themes within the higher level themes of autonomy, competence, and relatedness (see Figures 1-3). The participants reported using imagery throughout the day, but more specifically, when in situations that were not enjoyable (e.g., clothes shopping), when they "had the time" (e.g., before bed or when bored), when they were not able to participate in actual active play (e.g., when in class), or before and after participating in active play. Moreover, participants from both genders reported using imagery relating to their active play. In total, 1090 text units were coded in 107 nodes. Specifically, the greatest number of text units were coded within the need for competence ($n = 505$) followed by relatedness ($n = 303$) and autonomy ($n = 282$). Gender differences were only considered if a particular theme was reported exclusively by one gender. Within the hierarchical trees (Figures 1-3), solid lines represent themes which emerged for both genders, dotted

lines represent themes which emerged for boys only, and dashed lines represent themes which emerged for girls only. The gender differences noted within the figures will be elaborated upon in the following sections.

Autonomy

As autonomous behaviours are those which are valued by the individual and engaged in out of expression of the self (Deci & Ryan, 2002), comments referring to aspects of intrinsically motivated (i.e., inherently interesting or intrinsically enjoyed) behaviours were considered components of this need. Within the higher level theme of autonomy, four lower level themes emerged; favourite activities, fun activities, frequent activities, and affective states. No gender differences emerged within the need for autonomy.

Favourite activities. Both boys and girls cited images of engaging in their most enjoyed activities. One example of this can be found in a quote from a 14-year old girl who was asked why she was picturing herself engaging in particular activities, “Because they are what I love doing the most. And that’s what I would want to be doing so you gravitate there.”

Fun activities. Images of having fun and enjoying themselves while engaged in active play were reported by both male and female participants. An 11-year old boy demonstrated this through the following comment, “I see myself with one of my best friends and his little brother and a couple other people from down the street and we’re all playing one big game and we’re having lots of fun.” In addition, a 9-year old girl offered the following comment regarding what she saw in her active play image, “I’m outside playing with my friends I’m happy because its fun.”

Frequent activities. The children noted imaging themselves in the activities in which they engage most frequently. This lower level theme differs from the abovementioned theme of ‘favourite activities’ in that those behaviours engaged in most frequently are not necessarily those which are the most preferred by the participants, as certain environmental constraints may prevent children from engaging in their most preferred activities. For example, a participant’s favourite activity may be rock climbing, yet may not have access to a rock climbing wall on a regular basis. A 13-year old boy reported his use of imagery relating to the activities engaged in most frequently through the following quote, “If it’s something that I do a lot then I usually picture it because I’m always thinking about it.”

Affective states. The participants reported images relating to both positive (e.g., happiness, excitement, joy) and negative (e.g., sadness, frustration, disappointment) affective states associated with active play participation. The following quote from a 10-year old boy illustrates the positive affect associated with imagery use during active play, “Well I kind of picture myself happy and joyful and like laughing around with my friends like just joking.” In addition, an 8-year old girl identified positive affective states in relation to the people present and the specific activities in which she engaged in her active play imagery, “I feel happy usually because I really like playing with my friends and I really like those games.” Comments referring to negative affective states in relation to active play imagery seemed to be evoked by contextual variables influencing the content of the image. For example, the following quote from an 8-year old girl asked to describe the emotions that she felt when imaging herself engaging in active play illustrates the possibility of positive or negative affect in relation to her active play

imagery, “All the feelings you can have depends what you are imaging, if it’s a happy image and you feel happy and if it’s a sad image you feel sad.”

Competence

The satisfaction of the basic psychological need for competence is reflected in feelings of effectiveness in association with an individual’s interaction with the social environment and experiencing opportunities to exemplify a global sense of confidence (Deci, 1975; Deci & Ryan, 2002). In this investigation competence consisted of the following lower level themes: skill level, body, improvement, skill execution, strategy, winning, and affective states associated with feelings of competence.

Skill level. Typically, participants imagined themselves competently performing their active play as skill level emerged as one of the lower level themes within the higher level theme of competence. This theme consisted of statements referring to unrealistic skill (i.e., performing at a higher skill level than would be possible in reality), skilled performance (i.e., being above average), average skill (i.e., as good as others), and images of being unskilled in their active play images. With respect to imaging oneself with a skill level beyond one’s capabilities, a 10-year old boy noted the following when imaging himself playing soccer with friends, “I picture myself going fast and my legs move a lot faster and when I kick my legs are a lot stronger so when I kick the ball it goes super far.” A 12-year old girl offered the following comment regarding images of being skilled in her dancing, “Like when you are doing dance you’re picturing yourself really really good and [being] flexible and when you are older and like really flexible and doing good turns and jumps.”

In addition to performing competently in their active play images, several determinants of unskilled performance emerged as lower level themes. An example from a 14-year old girl demonstrates the use of an image of poor performance during active play, “Well if I am playing like soccer, I see myself trip over the ball and fall on my butt.” The theme of unskilled performance demonstrated the only gender difference within the higher level theme of competence. More specifically, female participants referred to generating images of low effort relating to less skilled performance than would be achieved through maximal effort. For instance, when a 13-year old girl was asked to comment on her level of physical competence in her active play imagery, she noted:

I see myself just walking really leisurely, not really trying that hard, just not wasting too much energy since I don't have to. I'm alright- not as good as I would be if I was being forced to try my hardest, but just like average.

Body. Comments referring to imagining one's body during active play were categorized into two separate lower level themes; body form/position and physiological responses. With reference to body form/position, a 13-year old boy explained his active play image relating to bike riding, “Like I'd be working my legs and arms, because like in the kind of biking that I do I'll have to like pull up the handle bars and turn around and try to land it perfectly like really balanced.” The second lower level theme consisted of participants' comments relating to the physiological components of their images of engaging in active play (e.g., energetic, fatigued, strong). This image of one's body being energized is depicted in the following comment from a 12-year old boy, “Well you

know it makes me feel relaxed, myself, but in the image you know it makes me feel like I could just keep on going forever and ever and ever without stopping.”

Improvement. Images relating to improving skill, strategy, and confidence in association with active play were reported by participants of both genders. With regard to improving strategy, an 8-year old girl described the role that active play imagery serves after actually engaging in the activity, “[I] imagine what I could have done instead of the stuff [strategy] that I did, so in the future I can plan what I am going to do next time.” A 12-year old boy also explained how imagery can be used to improve confidence during active play, “It’s just a self-confidence thing again. So if you’ve never done it before and you don’t know if you are good or not, you just think that you’ll be ok.”

Skill execution. Images relating to the execution of skills during active play were reported by participants of both genders. Specifically, participants reported images of successful skills such as scoring goals, proper technique, and making accurate passes, but also of merely executing a specific motor task. This last point is evident through the following quote from a 12-year old girl in response to a question about what she saw in her images of simply running in her active play, “I would see myself, like I said at the beginning, I would maybe see like feet or something in the background I guess. And I would see me running by.” The following quote from a 7-year old boy demonstrates his use of imagery relating to the execution of the skills which would be necessary when actually participating in a variety of activities, “It’s just like throwing, like throwing the ball, and in soccer when you kick the ball, you kick the ball, [and with] football, you kick the ball.”

Strategy. The children reported using images relating to two aspects of strategy; getting into position and outperforming others in their active play. The theme of getting into position broadly encompassed all comments referring to images of positioning the body in such a way as to result in a successful outcome during active play. This is exemplified in the following quote from a 10-year old boy:

When I picture myself playing sports with my friends like I play soccer with my friends, I even picture myself thinking of what I'm going to do next-- like what move, like what am I going to do like shoot or pass.

The participants also reported images of outperforming others. For example, a 12-year old girl referred to out-skating an opponent in a race, "Like if you are skating and you are going after what you are skating for [goal], you picture yourself at the end of getting it so you want to get there before the other person."

Winning. The participants from both genders also reported images of winning a competition within their active play. For example, when asked why she felt that she was skilled in her image, a 7-year old girl stated that, "Because when me and my cousins and family are playing basketball, my team won." Also, a 9-year old boy referred to winning in association with positive affective states when responding to a question about imaging himself in active play, "Usually [be]cause like you are excited to do it [activity] and happy you think about yourself winning and stuff like that."

Affective states. Similar to autonomy, participants reported both positive and negative affective states in association with competence felt during active play. More specific to positive affect, a 12-year old boy who imagined engaging in archery as a component of his active play said:

I would be happy, concentrated and learning. After a like really good shot after I was in the center [of the target] I would be able to see what I did right there and the small things I did wrong that I could improve to maybe hit the center.

Again, comparable to autonomy, comments relating to negative affect and competence were often contextual, as demonstrated through the following quote from a 9-year old boy. When asked if the specific activity in the image in his mind influenced his emotions he responded:

Ya that would be true because you might be better in one and like not as good in the other, so that changes your emotions like when you're like done you'll be like happy and if you lose you'll be like 'maybe next time.'

Relatedness

As relatedness refers to having a sense of belonging and connection to others (Deci & Ryan, 2002), the following lower level themes emerged; playmates (i.e., those who are with the participant in the image), determinants (i.e., why these people are in the image), and affective states associated with others in the image.

Playmates. Although some participants imaged themselves playing alone, both male and female participants typically reported imagining themselves participating in active play with family, others, and peers (e.g., friends, best friends, schoolmates). Participants reported imaging themselves in active play with certain family members (i.e., siblings and parents), as a 9-year old girl stated, "Well when I picture myself with my brother and my dad, I see how nice it is outside and I picture how we used to go outside and play soccer so I go out with my Dad." The following statement from a 10-year old boy demonstrates his active play image with his friend, "I picture myself with my friend,

[friends name], like riding around on our bikes.” Other individuals were also identified within participants’ images, and it was within this theme that a gender difference emerged. Specifically, only the male participants reported imaging themselves engaged in active play with others such as professional athletes. An 11-year old boy offered this statement, “Sometimes, I imagine that I’m playing with the bigger guys like in the NHL.”

Determinants. Both male and female participants reported imaging others engaged with them during active play because they enjoy their company, they share an interest for the specific activity, and because they are the people with whom they engage in the activity most often. The following quote from a 13-year old boy demonstrates participant’s use of images containing those people with which they most frequently engage in the activity, “Whenever you are playing, you usually play with those people so when you are imagining it you just kind of play with them.” Some gender differences did emerge within this theme. Specifically, only males reported imaging themselves engaged in active play with others who they do not see often (e.g., a distant relative). A 7-year old boy made the following reference for why he imagines himself playing with his cousins:

I see [image myself with them], because I never get to see my cousins only if I go there which is probably three times a month, I get to see my cousins so its really rare so its really special to me when they come.

Exclusive to females were images of active play in which others are encouraging or cheering them on. This was evident through the following response from a 12-year old girl when asked about her active play images, “Like if you are swimming you are going to hear what people are saying when they cheer you on.”

Affective states. In accordance with the findings with autonomy and competence, positive and negative affective states also emerged as lower level themes under relatedness. One gender difference was noted as female participants did not report positive affective states in association with their active play images. Positive affective states during active play was referenced solely by males, as is evident in the following quote from a 10-year old boy describing imaging himself laughing in spite of performing poorly with his friend, “It kind of makes me feel funny because me and [friends name] both stink at badminton so we’re laughing at how bad the other one is.” Negative affective states in association with participants’ images with others were reported for both genders. This is noted in the following quote from an 8-year old girl referring to how she feels when imaging herself skateboarding with her sisters, “Sad, because my sisters are way better at it.”

Discussion

The general purpose of the present study was to qualitatively investigate children’s use of imagery as it relates to their active play. BNT (Deci & Ryan, 2000), a widely cited theory of motivation in sport and exercise psychology research, was the theoretical foundation used to assist in the development of the focus group interview guide. A second purpose was to determine if and where gender differences exist in children’s imagery use during active play. Although previous studies have shown the positive influence of need satisfaction on children’s intrinsic motivation and well-being in the sport and exercise context (e.g., Coatsworth & Conroy, 2009; Hagger et al., 2003), predictors of need satisfaction remained unknown. Results of the focus group discussions describe children’s use of active play imagery as it satisfies the three basic

psychological needs of autonomy, competence, and relatedness. While several gender differences were noted in the lower levels of analysis (i.e., the ways in which imagery satisfied these needs), no gender differences were evident at the highest level of analysis (i.e., satisfaction of the need for autonomy, competence, and relatedness) thus supporting Deci and Ryan's (2000) proposition that the satisfaction of the basic psychological needs is essential for all human beings' regardless of age, gender, or culture.

When asked about their active play imagery, the participants made reference to various points throughout the day during which they imagined themselves engaging in active play. This finding is in support of previous research which found that child athletes use imagery both inside and outside of practice and competition as well as spontaneously throughout the day (Munroe-Chandler et al., 2007). Given the robustness of this finding across age groups within sport imagery literature (Munroe, Giacobbi, Hall, & Weinberg, 2000; Munroe-Chandler et al., 2007), the versatility of imagery as a skill is encouraging. Within the domain of educational psychology, children have been noted to spontaneously incorporate imagery into the interpretation of prose passages (Levin & Divine-Hawkins, 1974), giving rise to the notion that imagery, as a skill, may be used spontaneously throughout the day in response to image provoking situations. Therefore, implementing structured active play imagery sessions at various points throughout the day in concert with the existing imagery which has been found to occur spontaneously, may be a useful intervention technique for enhancing intrinsic motivation to engage in active play.

As autonomously motivated behaviours are those in which individuals engage out of inherent interest or enjoyment (Deci & Ryan, 2002), the findings from the present

study demonstrate the utility of imagery as means through which to satisfy this need. The participants placed particular importance on active play images of having fun and engaging in enjoyable activities as well as positive affective states in association with these images. By incorporating positive, fun, and enjoyable experiences into their active play imagery, it is within reason that participants' imagery use reflects intrinsic motivation to actually engage in these behaviours. Specifically, in active play, children may spontaneously create or re-create images of positive experiences in order to divert their attention from less enjoyable activities representing a self-determined (i.e., autonomous) shift in attention. Research investigating the utility of imagery as a distracter from pain eliciting medical procedures provides some support for this view. Although imagery within this situation is provoked rather than spontaneous, Broome, Bates, Lillis, and McGahee (1994) demonstrated that imagery, as a component of a distraction exercise, decreased pain ratings of children undergoing a lumbar puncture procedure. In line with these findings, it may be possible that children imagine enjoyable and fun situations in order to distract from those which are less enjoyable (e.g., school work).

Notably, within all three higher level themes (i.e., the basic psychological needs) some participants associated negative affective states with their use of active play imagery. This finding seemed to reflect certain contextual variables influencing participants' global affective state during their imagery use. The interaction between affect and image content is in support of previous imagery research with adults. In particular, it has been found that imagery scripts delivered in the form of audio recordings, which were either positively or negatively worded, evoked corresponding

changes in mood following the treatment (Maude-Griffin & Tiffany, 1996). Although these findings are correlational, they provided insight on the potential congruence between mood/affect and the content of images. In addition, it is possible that the negative aspects of active play imagery reported in the present study may serve a motivational role depending on the individual's coping response to the image. A child's schematic representation of themselves in their active play image may play a greater motivational role than the positive or negative valence of the image and may therefore be useful regardless of the specific image content. Therefore, contextual variables which may influence children's affective states may be important to consider when developing applied interventions for increasing intrinsic motivation to engage in active play through the use of imagery.

Drawing from research with athletes examining different types of outcome-related imagery, Taylor and Shaw (2002) suggested that individuals may use both positive and negative imagery. In support for Taylor and Shaw's contention, the findings from the current study imply that children use images portraying themselves of varying active play skill levels (ranging from unskilled to unrealistically skilled). Given the suggestion that the valence (i.e., positive or negative direction) of an individual's image may influence the skill at which that individual performs in a particular task (Beilock, Afremow, Rabe, & Carr, 2001), this finding is particularly important in relation to the basic need for competence. Although most studies examining positive and negative imagery have taken place in the laboratory setting with participants instructed to image either a positive or negative outcome in association with a given motor task (e.g., golf putting), results have generally supported the association between positive imagery and positive outcomes and

negative imagery and negative outcomes (e.g., Taylor & Shaw, 2002; Woolfolk, Parish & Murphy, 1985). As participants in the present study emphasized images of being highly skilled in their active play images, it is likely that children's use of both positive and negative imagery related to active play represented the extent to which the need for competence was satisfied through imagery. Future research may find that only images of highly skilled performance influence satisfaction of the need for competence, whereas images of low skill may thwart this need.

Consistent with previous findings regarding CS imagery (e.g., images related to the execution and development of specific motor skills) use and young athletes (Munroe-Chandler et al., 2007), the participants in the present study noted aspects of body positioning and form, as well as the execution of specific skills within their active play images. Despite this congruence, Munroe-Chandler et al. (2007) found that males did not report using images relating to aspects of MG imagery (e.g., images related to affect, arousal, mental toughness, confidence, and being in control of a performance situation), a finding that did not emerge in the present study. In fact in the current study, both male and female participants reported images related to winning (MS) and affective states (MG-A) in association with active play. This incongruence may be due to developmental differences, which were not examined as a component of this study, given many of the gender differences found in Munroe-Chandler et al.'s (2007) study with young athletes were only evident within the youngest cohorts of males (7-10 years).

Three lower level themes emerged for relatedness, which described participants' experiences in imaging themselves engaging in active play with others: playmates (i.e., with whom they were playing), determinants (i.e., why they image themselves with these

people), and the positive and negative affective states associated with imaging themselves with these people. Although some participants reported imaging themselves engaged in active play alone (i.e., with no other people), some participants also reported imaging themselves with peers or others their age. Specifically, the children in the current focus groups reported images involving friends, best friends, schoolmates, and neighbours in addition to several family members, most notably parents and siblings. As active play offers children an opportunity to enhance their social well-being (e.g., development of friendships, cooperation, and leadership; Burdette & Whitaker, 2005), the importance of affiliation within children's images of engaging in active play is apparent.

Research from educational psychology has demonstrated the importance of relatedness in promoting academic engagement in students. As stated by Furrer and Skinner (2003), feelings of connectedness with others enhance effort, persistence, and participation in academic activities, while promoting interest and enthusiasm, and diminishing anxiety and boredom. Given the nature of motivation for participation in active play, the finding that children typically imagine themselves with others in their active play lends support to Furrer and Skinner's assertion. Moreover, support may also be found in the physical activity domain. In a recent review of 96 published studies examining parent's influence on children's physical activity behaviours, parental modelling, involvement, and support showed positive associations with several different types of children's physical activity ranging from organized sport to leisure-time physical activity behaviours (Edwardson & Gorely, 2010). Additionally, in an examination of peer and parental influences on leisure-time physical activity (Anderssen & Wold, 1992), it was found that the physical activity level of parents and peers as well as support from these individuals significantly

influenced children's self-reported levels of leisure-time physical activity. Given participants in the current study reported members of the family and peer group as active agents in their imagery, it may be that children imagine themselves with those people who typically influence their engagement in active play.

The finding that participants imaged themselves engaged in active play alone may find support from two contrasting views of solitary play in children's development. Solitary play has been found to be indicative of independence and maturity within a child (Moore, Evertson, & Brophy, 1974), which would suggest that perhaps more mature children may image themselves engaging in active play alone more often than less mature children. Contrastingly, solitary play has been viewed as a marker of social and academic maladjustment amongst pre-schoolers (Coplan, Wichmann, & Legacé-Séguin, 2001). This last view may be in support of BNT in that, the basic need for relatedness would not be satisfied and as a result may compromise an individual's psychological well-being (Deci & Ryan, 2000). It is possible that the underlying reasons for participants imagining themselves engaging in solitary active play is the result of individual or developmental differences in children's preference for interaction with others.

When examining the transcribed focus groups for gender differences, several emerged within the higher order themes of competence and relatedness. Active play imagery, which portrayed participants at varying skill levels, resulted in one gender difference within the theme of competence. Only female participants reported imaging themselves performing poorly as a result of exhibiting minimal effort in their active play. Given that active play may range from light to vigorous intensity (AHK, 2010), it was not

surprising that differences would emerge in the amount of effort reported in association with these behaviours. Support for this specific difference was offered by Pellegrini and Smith (1998) in their review of physical activity play literature. Specifically, it was suggested that the physical activity play behaviours of children around middle childhood and into early adolescence shift to include more vigorous activities, and furthermore that boys typically engage in these behaviours at a higher intensity level and for a longer duration than do girls (Pellegrini & Smith, 1998). It is therefore possible that female participants imagined themselves engaging in behaviours which reflected the amount of effort with which they may actually exert in the active play setting. As the participants in the present study referred to images of poor performance resulting from exhibiting low effort in their active play imagery, perhaps the amount of effort put forth in these images has implications on their imagined level of competence in these activities.

Relatedness yielded the most gender differences among the higher level themes. Only male participants reported active play images that included others, namely professional athletes. Male participants may be more easily able to develop images of professional athletes with whom they would like to play and aspire to be, as they are provided with greater exposure to these individuals. In their review of literature examining athletes as children's role-models, Biskup and Pfister (1999) concluded that girls and boys typically choose role-models that conform to traditional gender roles, and as a result, sportswomen are rarely chosen as role models by young girls. It is thus likely that female participants did not report using images in which professional athletes were included as most young females did not consider elite level female athletes as role models (Biskup & Pfister, 1999). However, in light of this, the gender differences found in the

present study may not be generalizable to a population of young athletes, given female children generally consider people with similar sport backgrounds to their own as role models (Veschio, Wilde, & Crosswhite, 2005).

Moreover, only male participants reported active play images incorporating those people who they do not see often. Potential support for this finding can be found within the domain of social psychology. Research examining the nature of peer groups in children's development found that boys tend to have larger peer groups than girls, with girls preferring stronger more intimate, self-disclosing, and dyadic relationships in contrast to males preferring a larger 'chum' group of friends and shared activities (Belle, 1989). Thus, it is possible that male participants did not feel limited to images of themselves with only their closest friends and family members, but rather as a result of their preference for a larger social group they may have been more likely to image distant relatives or old friends with whom they do not have frequent interaction.

Exclusive to female participants were images referring to others encouraging them or cheering them on, which may shed light on the importance female participants placed on receiving social support from others. In a study examining the role of friends and parents in supporting physical activity behaviours, Springer, Kelder, and Hoelscher (2006) found that friends' physical activity levels, and parent and friend encouragement of physical activity was associated with higher levels of moderate to vigorous physical activity of 6th-grade girls. Given the lower levels of physical activity found amongst girls as they approach adolescence (Strauss, Rodzilsky, Burack, & Colin, 2001), incorporating support from their peers and family members into their active play imagery

may be a useful tactic to employ for motivation to increase physical activity levels through active play and ultimately, leisure-time physical activity behaviours later in life.

The final gender difference noted within the theme of relatedness was in participants' affective states relative to their active play images with others. Specifically, females did not report positive affect in relation to these images. This finding was particularly interesting given that positive affect was reported as a component of the needs for autonomy and competence. This may be attributed to the difference in the perceived social status of physically active boys and girls. As noted in a qualitative examination of the influence of the social group on physical activity participation of 10-11 year old boys and girls from the United Kingdom (Jago et al., 2009), boys perceived as skilled in their physical activity by their peers are typically seen as more popular than those who are deemed unskilled or do not participate. However, the authors state this relation is less clear amongst females, as females perceived as less skilled or who do not participate in physical activity are often deemed more popular than those who are skilled or do participate. It is therefore possible that females' participation in physical activity is not socially desirable (i.e., does not enhance social status), and as a result females may not experience the same positive affective states in relation to others in their active play images as do males.

Given imagery has proven to be an effective motivator for adults in the exercise setting, the results of the present study support children's use of imagery as a motivational tool for enhancing engagement in active play. Additionally, the results provide support for the efficacy of using self-determination theory as the theoretical foundation for future exercise or active play imagery studies. Future research should

quantitatively establish the relation between active play imagery and the three basic psychological needs posited in BNT. Once this is accomplished, the development of an objective measure of active play imagery is necessary in order to test the association between active play imagery and other aspects of motivation and well-being (e.g., subjective vitality, positive affect, etc.) within the context of active play. Lastly, the practicality of these findings must be established through intervention based research in order to draw causal conclusions for the influence of active play imagery on markers of active play motivation (e.g., exercise intention).

The current study had several limitations which should be acknowledged. The participants' previous experience with imagery, active play, or leisure-time physical activity was not assessed prior to the focus group discussions. Accordingly, there may have been differences in participants' experience using imagery or physical activity levels which may have influenced the results as some participants may have had more experiences to draw from when creating their images in relation to their active play. Additionally, the present research did not control for other contextual variables (e.g., proximity to last exercise session, specific camp activities in which the participants engaged), which may have influenced participants' responses. Moreover, it is possible that the developmental stage of the participants may have influenced their ability to articulate some of the intricacies of their images leading to age-specific gender differences. Lastly, due to the combined inductive and deductive techniques used in the present study, questions within the interview guide were created specifically to assess images relating to the three basic psychological needs posited in BNT. As a result, it is possible that the questions may have primed participants to respond with comments in

line with these needs and potentially at the expense of revealing other needs which may be satisfied through active play imagery but not accounted for in BNT.

In spite of these limitations, the present study provides an overview of a specific motivational process which may influence children to engage in physical activity through the well-supported relation between imagery and motivation. As imagery is inherently autonomous, volitional, and under the control of the individual, it may be a particularly useful skill to employ for children whose behaviours are typically controlled by others (e.g., parents or teachers). Practically, these findings may have some applicability to those developing physical education curricula as it is within this domain that the majority of BNT and exercise research has been conducted. It may therefore be possible to incorporate structured imagery sessions into existing physical education lessons in order to enhance intrinsic motivation to actually engage in these behaviours outside of the classroom.

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FIGURE CAPTIONS

Figure 1. A Framework for Children's Autonomy Related Imagery Use during Active Play

Note. Themes emerging from focus group discussions relating to the basic psychological need for autonomy.

Figure 2. A Framework for Children's Competence Related Imagery Use during Active Play

Note. Themes emerging from focus group discussions relating to the basic psychological need for competence. Exclusive to females was the use of a component of the lower level theme of being "Not Good," represented by the perforated line.

Figure 3. A Framework for Children's Relatedness Related Imagery Use during Active Play

Note. Themes emerging from focus group discussions relating to the basic psychological need for relatedness. Exclusive to males was the use of a component of the lower level theme of imaging themselves with "Others" and those who they "Don't see often," represented by the dotted line. Exclusive to females were images of others encouraging them, represented by the perforated line.

FIGURES

Figure 1.

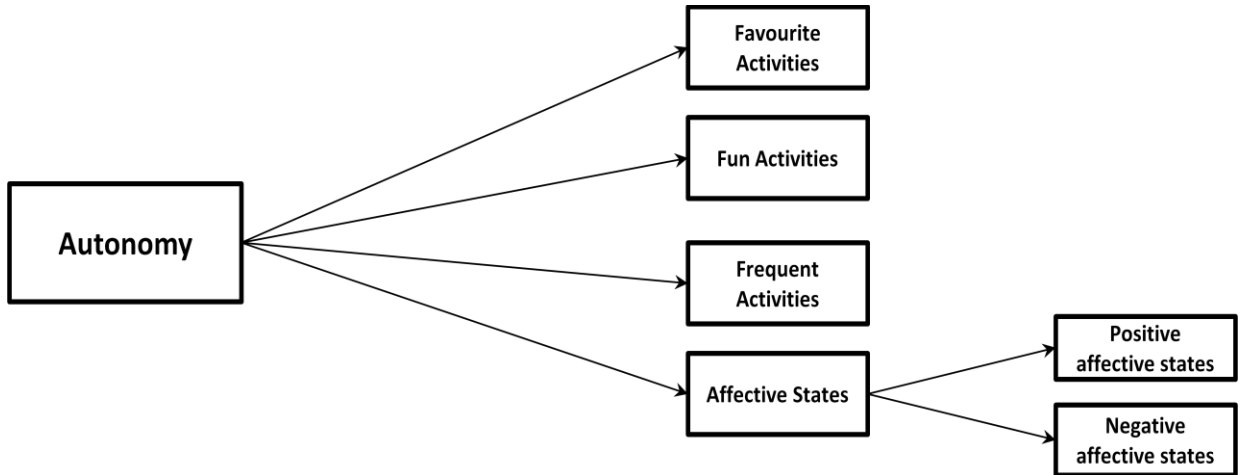


Figure 2.

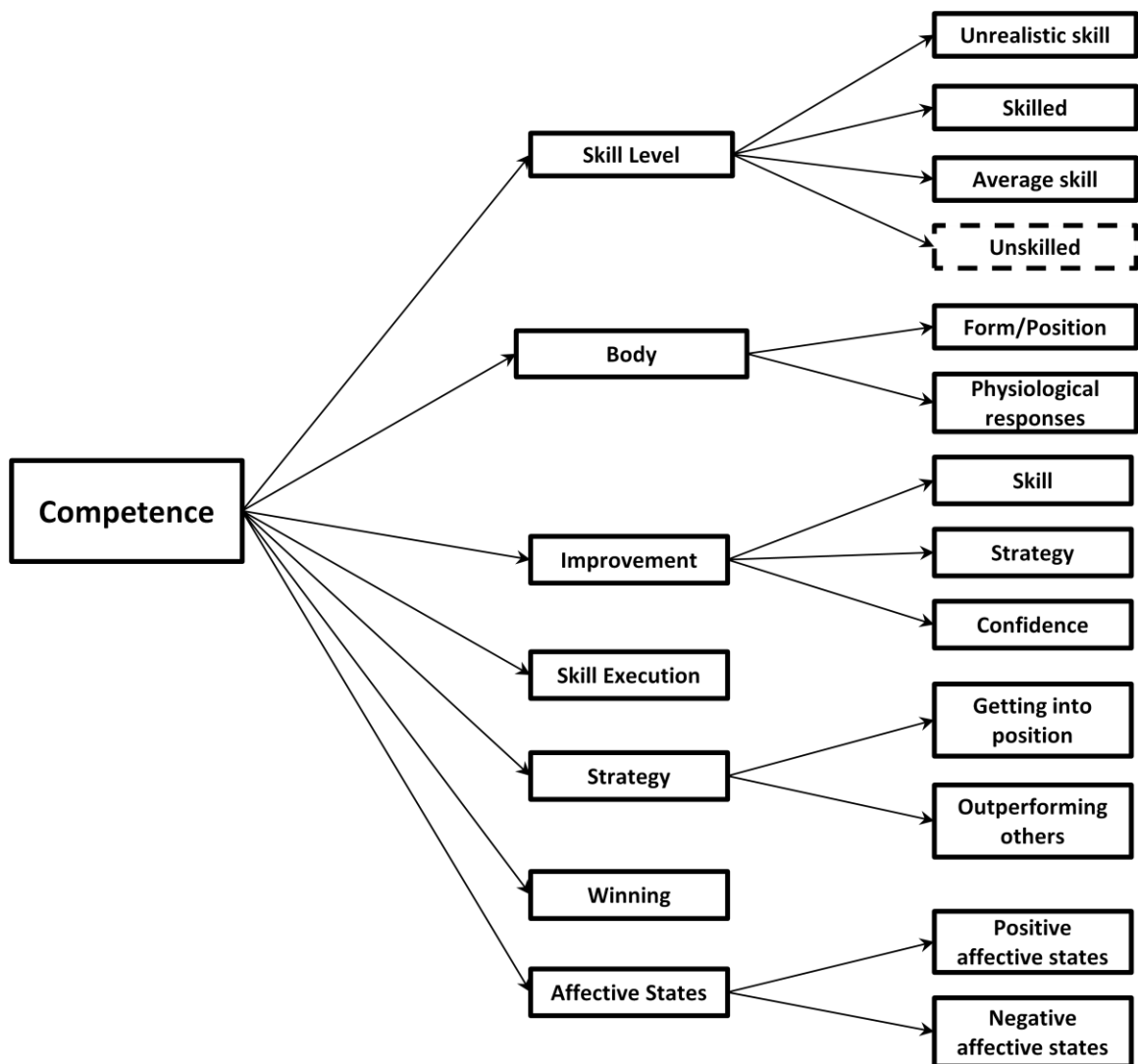
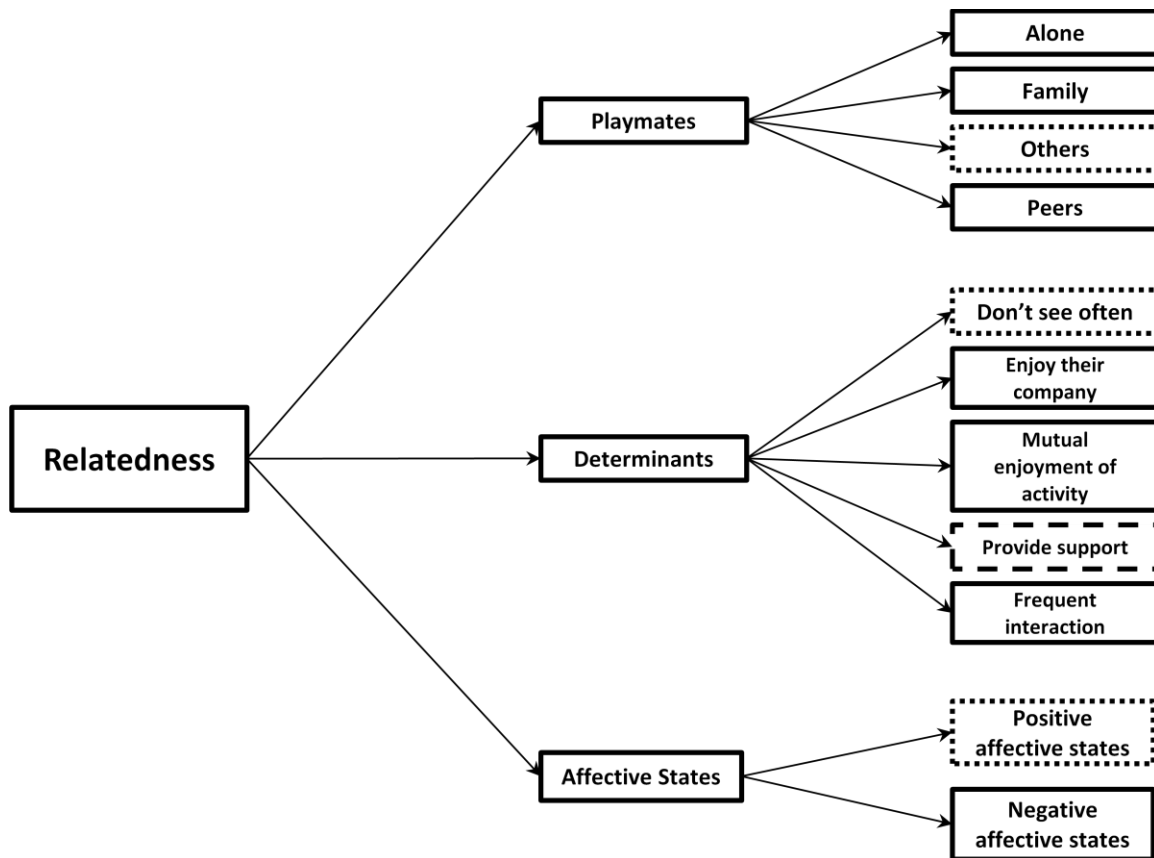


Figure 3.



REVIEW OF LITERATURE

Introduction

In a recent report, Canadian children received an overall grade of “F” in Physical Activity Level (AHK, 2010) with 88% of children not meeting national physical activity guidelines (CFRLI, 2009). Contributing to this failing grade was an excess of time spent in front of television or computer screens and a lack of time spent engaging in active play (AHK, 2010). Active play has been defined as, unstructured physical activity that takes place during a child’s free time (Veitch, Salmon, & Ball, 2008), and provides unique contributions to children’s cognitive, physical, social, and emotional development above those provided through structured forms of leisure-time physical activity (Burdette & Whitaker, 2005). Given that physical activity during childhood has been found to reduce obesity, improve motor skill development, enhance body image, improve self-esteem, and appropriately manage anxiety and depression (AHK, 2010), it is important to examine sources of motivation for engagement in active play in an attempt to increase the physical activity levels of children. Research with adults has found that one potential source of motivation for physical activity is the use of imagery (Giacobbi, Hausenblas, Fallon, & Hall, 2003). Imagery is a mental skill which has been shown to positively influence adult exercisers’ sense of self-efficacy (Giacobbi et al., 2003), and intention to exercise (Rodgers, Munroe, & Hall, 2002). More recently Munroe-Chandler and Gammage (2005) have hypothesised that imagery may have a role in improving exercisers skill, routine, form and technique.

Self-determination theory (SDT; Deci & Ryan, 2000) provides possible support for exercise imagery as an effective motivational tool. SDT posits that human behaviour

is the result of the desire to satisfy three basic psychological needs; autonomy, relatedness, and competency. Moreover, individuals are inherently attracted (i.e., motivated) to situations which appear to support these needs (Deci & Ryan, 2002). Despite the extensive research supporting the benefits of adult exercisers' use of imagery, there is a scarcity of research examining children's imagery use related to active play behaviours.

Imagery

Imagery research has been conducted in both sport (children and adult) and exercise (adult) contexts and its positive influence on motor performance is well documented (Hall, 2001). Early research on imagery was conducted from a competitive sport performance perspective and yielded an abundance of empirical support for its benefits to athletes. In particular, imagery has a positive effect on the acquisition of new skills (Hall, Schmidt, Durand, & Buckolz, 1994), self-efficacy (Munroe-Chandler, Hall, & Fishburne, 2008), collective efficacy (Munroe-Chandler & Hall, 2004), self-confidence (Strachan & Munroe-Chandler, 2006) and concentration (White & Hardy, 1998).

Research focusing on exercise imagery began to flourish after the suggestion from Hall (1995), that imagery may have similar benefits for exercisers as it does for athletes. Subsequent research noted that exercisers use three types of imagery: energy (e.g., imagery related to energizing and relieving stress), appearance (e.g., imagery related to physique and fitness), and technique (e.g., imagery related to the proper execution of a skill) (Hausenblas, Hall, Rodgers, & Munroe, 1999). Recognizing the potential limits of only three types of exercise imagery, Giacobbi et al. (2003) extended upon the findings of Hausenblas et al. through their use of grounded theory techniques. Eight higher order

themes emerged from their analysis which were similar to those found by Hausenblas et al. as well as several new themes: exercise technique, aerobics routines, exercise context, appearance images, competitive outcome, fitness/health outcomes, emotions/feelings associated with imagery, and exercise self efficacy. Although exercise imagery research is in its infancy, the extant literature supports Hall's (1995) contention that imagery use can be a practical skill to employ by those adopting or adhering to an exercise program.

While many athletes and exercisers find the use of imagery to be beneficial to their performance (Giacobbi et al., 2003; Munroe, Giacobbi, Hall, & Weinberg, 2000), there exists no single comprehensive definition that has adequately described the complexities of the skill (Hall, 2001). A definition put forth by White and Hardy (1998) accounted for several critical aspects for the understanding of imagery, and is the most widely used definition in contemporary imagery research. Imagery is:

an experience that mimics real experience. We can be aware of "seeing" an image, feeling movements as an image, or experiencing an image of smell, tastes or sounds without actually experiencing the real thing... it differs from dreams in that we are awake and conscious when we form an image. (White & Hardy, 1998, p. 389)

A similar definition has been proposed by Vealey and Greenleaf (2006), who described imagery as "using all of the senses to re-create or create an experience in the mind" (p. 307). Notable commonalities between these two widely used definitions of imagery can be seen in their references to both imitating real experience, and in its multi-sensory nature. Given both of those definitions were originally developed for research in the

sport context, Hausenblas et al. (1999) provided a definition for use in the exercise context in which they define imagery as

... mentally seeing yourself exercising. The image in your mind should approximate the actual physical activity as closely as possible. Imagery may include sensations like hearing the aerobic music and feeling yourself move through the exercises. Imagery can also be associated with emotions (e.g., getting psyched up or energized), staying focused (e.g., concentrating on aerobic class and not being distracted), setting exercise plans/goals (e.g., imagining achieving the goal of losing weight), etc. (p. 173)

Although the definition incorporates several important characteristics of the aforementioned sport definitions (Vealey & Greenleaf, 2006; White & Hardy, 1998), Hausenblas et al. tailored it to the exercise context. As such, for the purposes of this review, Hausenblas et al.'s definition will be used to operationalize exercise imagery.

Imagery Theories and Models

Bioinformational theory. Lang's (1979) bioinformational theory incorporates aspects of psychophysiology, information processing theory, and behavioural therapy to explain the effect that emotional imagery has on the treatment of phobias and anxiety disorders. In this regard, Lang posited that analyzing fundamental units of information known as "propositions" was the most appropriate way to describe mental images. Propositions were defined as "logical relationships between concepts" (Lang, 1979, p. 499), which represent the meaningful structure behind mental images, rather than merely the image itself. Specifically, two types of propositions were identified; stimulus and response. Stimulus propositions were those referring to the imagined environmental

stimuli, while response propositions referred to the imagined behavioural reaction to the environmental stimuli. Response propositions are modifiable in that they reflect the actual behaviours an individual would likely display given their physiological reactions to real-life stimuli. As such, those images that contain response propositions are more likely to induce physiological reactions (e.g., arousal) than those containing only stimulus propositions. For example, an imagery script describing the symptoms of arousal felt by a soccer player taking an important penalty kick would be more likely to provoke actual feelings of heightened arousal than a script which describes only environmental stimuli. Although Hall (2001) has noted that the bioinformational theory is limited in that it does not take into account the motivational functions of imagery, its strength lies in the suggestion that imagery is not merely associated with environmental and sensory stimuli but rather that it can be associated with the emotions and physiological responses to a given situation.

The triple-code model (ISM). Ahsen (1984) asserted that although images are experienced as an isolated event, three distinct components are involved in shaping them: the image itself (I), the somatic response to the image (S), and the meaning associated with the image (M). The first component, the image, was defined as a centrally aroused sensation which possessed all of the characteristics of the sensation without an actual overt experience. The image was considered to represent the outside world and the objects it contains insofar as the individual experiencing the image is able to interact with and manipulate their imagined environment. The somatic response component is described as the psychophysiological change experienced by the individual while they are imaging an object or situation, specifically, the skeletal, proprioceptive, or sensory

experiences that are elicited by their imagined environment. Finally, Ahsen stated that all images convey some significance to the individual, thus enabling the individual to interpret their personal relationship with the imagined environment or object.

Significance and meaning of an image to an individual is based on an individual's history and experiences and therefore will differ from that felt by another individual experiencing the same image (Morris, Spittle, & Watt, 2005). The ISM components were considered to vary temporally relative to each other giving six combinations with which an image could be experienced. Moreover, the most effective images are those in which the components are ordered in the most natural and useful order (Ahsen, 1984).

Framework for imagery use in human performance. Contemporary imagery research has stemmed from Paivio's (1985) analytical framework which posits that individuals use imagery for both cognitive and motivational functions, and further, that these functions operate at either a general or specific level. Cognitive specific (CS) imagery refers to the mental rehearsal of specific motor skills, while cognitive general (CG) imagery refers to the images of behavioural strategies used to achieve some performance goal. Motivational specific (MS) refers to imagining the achievement of specific goals or goal-oriented behaviour (e.g., winning a gold medal or losing five pounds), while motivational general (MG) imagery is used to imagine affect or arousal states associated with performance.

A delineation of the MG function of imagery was later established by Hall, Mack, Paivio, and Hausenblas (1998) in which they separated MG into arousal and mastery oriented images. Motivational general-arousal (MG-A) imagery remained as images associated with the affect or arousal of performance while motivational general-mastery

(MG-M) imagery was found to be associated with images of being mentally tough, confident, and in control of the performance situation. Although Paivio's (1985) analytical framework has been widely referenced in recent imagery research, it has been criticized for not acknowledging situational or personal influences on the type of imagery used (e.g., sport context, imagery ability; Martin, Moritz, & Hall, 1999).

Imagery in Sport

Applied Model of Imagery Use in Sport

To account for some of the limitations of Paivio's (1985) analytical framework, Martin et al. (1999) incorporated aspects from the triple-code model (Ahsen, 1984) and bioinformational theory (Lang, 1979) to develop an applied model of imagery use in sport (Figure 4). Specifically, they considered the notion that different images have different meanings to individuals, and that these meanings can influence the way that the individual responds cognitively, affectively, and behaviourally to the image (Martin et al., 1999). After a thorough review of the literature, they identified key imagery-related variables: the sport situation, the type of imagery used, imagery ability, and the outcomes associated with imagery use.

The well supported finding of a direct relation between imagery type and associated outcomes is reflected in the positioning of these variables within the model. The model is centered on the type of imagery employed, which is comprised of the functions originally proposed by Paivio (1985) and refined by Hall et al. (1998). The literature clearly demonstrates that different types of imagery (e.g., CS, CG, MS, MG-M, MG-A) are used to achieve different outcomes (Martin et al., 1999). Furthermore, the type of imagery used has been shown to be influenced by the situation. Specifically,

athletes may employ different types of imagery for training, competition, and rehabilitation, as well during the off-season (Jones & Stuth, 1997). Lastly, the model indicates that an athlete's ability to use kinaesthetic and visual imagery will moderate the relationship between imagery type and outcomes associated with imagery. Kinaesthetic imagery has been described as the imagined sensation of bodily position or movement that would normally arise from the stimulation of sensory nerve endings in muscles, joints, and tendons in real life (Weinberg & Gould, 2007), whereas visual imagery is related to the perceptual experience of seeing and the visual processing of information (i.e., visualizing or forming mental pictures) (Morris et al., 2005). The ability to use both visual and kinaesthetic imagery varies between individuals with research generally showing that the ability to use both of these imagery modalities is associated with greater performance (Meyers, Cooke, Cullen, & Liles, 1979).

The Four W's

A detailed description of the nature of imagery use in sport was provided by Munroe et al. (2000) using the in-depth interviews of 14 elite level athletes. The authors sought to determine *where* imagery was being used, *when* the athletes used imagery, *why* they used imagery, and *what* was being imaged. Athletes' reasons for using imagery corresponded to Hall et al.'s (1998) five types of imagery for human performance. However, using the four w's approach, Munroe et al. (2000) extended those findings by noting several important delineations within each type of imagery. CS images were found to encompass images relating to both skill development and skill execution. CG images were found to include both strategy development (e.g., using imagery to develop strategies and routines) and strategy execution (e.g., using imagery to enhance

performance of the strategies). MS imagery was described by both process (actions an athlete must engage in to perform well) and outcome (a competitive end result) goal-related imagery experiences. MG-A imagery comprised of images associated with excitement, control, and relaxation. Lastly, MG-M imagery was found to account for mental toughness, focus, confidence and positivism (Munroe et al., 2000).

Imagery Measures

Prior to 1998, only one inventory had been developed to assess the use of imagery types described by Paivio (1985), the Imagery Use Questionnaire for Soccer Players (IUQ-SP; Salmon, Hall, & Haslam, 1994). Although the IUQ-SP demonstrated adequate internal consistency, it was sport specific and therefore not applicable to any sport but soccer. Noting this limitation, Hall et al. (1998) developed the Sport Imagery Questionnaire (SIQ) to measure the frequency of imagery used by athletes competing in any sport.

The development of the SIQ was based on the assumption that the five types of imagery were orthogonal (they would vary independently of each other depending on the individual using them (Hall et al., 1998). Initial psychometric assessments resulted in a five factor structure with 30 items quantifying the five types of imagery. Additionally, the SIQ demonstrated adequate validity and reliability (Hall et al., 1998). In accordance with the findings of Salmon et al. (1994), athletes reported using imagery more for motivational than cognitive reasons. It was speculated that motivational imagery was employed more often due to the fact that athletes used imagery more during competition than in practice (Hall et al., 1998). The predictive validity of the SIQ was also demonstrated as imagery use predicted successful sport performance (Hall et al., 1998).

Since its development, the SIQ has been used extensively to assess cognitive and motivational imagery use with adult athletes (Morris et al., 2005).

Child Athletes' Use of Imagery

Noting the potential applicability of imagery use in all athletes, Munroe-Chandler, Hall, Fishburne, and Strachan (2007) employed focus groups to investigate the nature of young athletes' imagery use. An interview guide approach (Patton, 1990) was used to determine the developmental differences in the types of imagery used by athletes aged 7-14 years. Athletes were separated by gender and age cohort (7-8, 9-10, 11-12, and 13-14 years). Emerging themes from the focus groups revealed that all athletes used imagery in training and competition and every age cohort reported using each of the five types of imagery outlined by Hall et al. (1998), however to a different degree than that of adult athletes. Given the emphasis placed on the development of fundamental skills in the early stages of children's participation in sport, it is not surprising the cognitive types (e.g., CS and CG) of imagery were frequently cited by these athletes. Older age groups (11-14 yrs) reported more motivational general imagery use (i.e., MG-A and MG-M). This result was attributed to the fact that many of the younger athletes may not have experienced anxiety provoking competitive situations, or those that require mental toughness and emotional control. One notable difference was also in *when* these young athletes used imagery. Athletes in the 7-8 year old cohort were the only age group to not report using imagery outside of practice or following competition. This age difference was attributed to the notion that many athletes at this age are involved in sampling several sports and may be driven by fun and excitement rather than goal attainment (Baker, 2003). As a result, these athletes would likely engage in less performance

appraisal outside of practice and competition than an athlete who directed their effort toward goal attainment through specialization in one sport (i.e., older age groups).

In addition to age differences, Munroe-Chandler et al. (2007) noted several gender differences in the types of imagery used by young athletes. Most notably, male athletes did not report using MG-A imagery, while female athletes noted that this type of imagery helped to regulate their arousal and anxiety levels during competition. The authors suggest that this gender difference may have been due to the presence of a social desirability bias, where male athletes were not comfortable discussing heightened anxiety levels in the presence of peers. Another potential explanation could be that the specific sports engaged in by the female participants (e.g., dance and gymnastics) invoke higher arousal and anxiety levels than the commonly reported male sports (i.e., soccer and volleyball) (Munroe-Chandler et al., 2007). Of those females who reported using MG-A imagery, only the older groups reported using it for relaxation or excitement. This result was attributed to the fact that older children face more stressors external to the sport context and may need to incorporate psychological skills (i.e., imagery) in order to cope with these stressors during practice and competition. Additionally, male athletes did not report using images that relate to mental toughness or confidence (MG-M). As “toughness” is typically considered to be a male dominated characteristic, the presence of social desirability bias is again a potential explanation for these findings (Munroe-Chandler et al., 2007). In examining the cognitive types of imagery, the authors noted that amongst the youngest age groups (7-10 yrs) male athletes did not report using images relating to the execution of specific skills (i.e., CS). This finding was thought to be the result of less developed information processing skills in young male athletes, whereas

more controlled and conceptual images were noted by females of the same age as well as all participants in older age cohorts.

As no child specific sport imagery inventory existed, the qualitative findings of the abovementioned study provided the springboard for a child centered questionnaire thereby not having to rely on the use of modified adult validated inventories (e.g., the SIQ). Administering an adult version of a questionnaire to a sample of children can be problematic as children may be unable to understand the terminology and concepts of which they are being asked to respond (Stadulis, MacCracken, Eidson, & Severance, 2002). One of the first studies to implement an early version of the child specific imagery questionnaire was conducted by Munroe-Chandler, Hall, Fishburne, and Shannon (2005) in which they examined the effectiveness of a CG imagery intervention with an under-13 girls' soccer team. The intervention spanned seven weeks during which athletes were subjected to multiple baseline assessments of their use of CG and CS imagery using their respective subscales from the child SIQ. Participants were then given the entire child SIQ both pre and post intervention. Analyses revealed a significant increase in the use of both CS and CG imagery from pre to post intervention which exhibited the utility of using such an intervention with this population. In addition, the researchers found a significant increase in the use of MG-A imagery, which they attributed to their use of response propositions (see bio-informational theory above) in the imagery script used as part of the intervention protocol.

Despite these significant findings, refinement of the child focused imagery questionnaire was necessary as a need existed for a valid and reliable instrument for the assessment of imagery use in youth sport athletes. The Sport Imagery Questionnaire for

Children (SIQ-C; Hall, Munroe-Chandler, Fishburne, & Hall, 2009) was subsequently developed. The researchers subjected the SIQ (Hall et al., 1998) to a three phase modification process involving item rewording and deletion, factor analysis, and convergent and discriminant validity assessments resulting in a 21-item measure with each item being rated on a five point Likert scale. In concert with findings using the SIQ with adults (Hall et al., 1998), child athletes reported using the MS and MG-M functions most often. In addition, factor analysis revealed a five factor model reflecting the five types of imagery measured by the SIQ. As such, it was determined that the scale had reasonable factorial validity and was a useful tool in assessing imagery use in child athletes (Hall et al., 2009).

Munroe-Chandler, et al. (2008) measured the relation between imagery use (using the SIQ-C), self-confidence and self-efficacy in a heterogeneous sample of youth soccer players. The researchers hypothesized that the use of MG-M imagery would predict self-confidence and self-efficacy for soccer, and furthermore that this effect would be more pronounced in competitive athletes than recreational athletes. Results confirmed the hypothesis that MG-M imagery would predict self-confidence and self-efficacy, and further that MS and MG-A imagery predicted self-confidence, however no difference was found between the two competitive levels. The lack of a significant difference between recreational and competitive athletes was thought to be the result of recreational athletes relying more on vicarious experience than competitive athletes who have the resources to draw on their own accomplishments and mastery experiences.

Imagery in Exercise

With the benefits of imagery use in sport well established, Hall (1995) suggested that exercisers likely use imagery in a similar manner to that of athletes. Referencing Bandura's social cognitive theory (1986), Hall (1995) proposed a model which described the role of imagery as a motivator for exercise participation through its influence on self-confidence and outcome expectancies. Self-confidence was affected both directly and indirectly through the anxiety variable. Therefore, it was proposed that by imaging oneself performing optimally at a given task (e.g., exercise) one may feel more confident that they are able to perform that task overtly or, by imagining themselves at a given level of anxiety, one might feel that they are in control and as a result are more confident in that situation. Outcome expectancies are believed to be influenced by imagery through outcome likelihood (how likely an individual feels that an outcome may occur) and by outcome value (the importance placed on the outcome by the individual). By imaging a desired outcome (e.g., a high level of fitness) one may feel that they have a higher likelihood of achieving that outcome. In addition to the influence of imagery on exercise motivation, Hall (1995) also noted a reciprocal interaction between imagery ability and imagery use.

Although Hall's (1995) model was theoretically sound, support for his claim that exercisers use imagery for motivation was, for the most part, anecdotal. In order to investigate the nature of exercisers' imagery use, Hausenblas et al. (1999) conducted a three phase study which resulted in the development of an objective measure. The first phase consisted of an open-ended questionnaire administered to a sample of aerobic exercisers with the intention of exposing the nature of exercisers' imagery use. The questionnaire consisted of three basic open-ended questions: *when* do exercisers use

imagery? *Why* do exercisers use imagery? And *what* do exercisers image? Results indicated that within the sample of 144 aerobic exercisers, 75% reported using imagery. The participants reported using exercise related imagery most often before bed/sleep, during class, when day dreaming, and before/after exercising. In response to the question of *what* they imaged, participants most often cited body image, techniques/strategies, feeling good about oneself, and motivation. Lastly, the participants reported using exercise imagery for the following reasons: motivation, feeling good about oneself, body image, and strategies and techniques. The remaining two phases of the study involved the development of a questionnaire, the Exercise Imagery Questionnaire-Aerobic Version (EIQ-AV), which consisted of three factors derived from the qualitative data collected during phase one: appearance, energy, and technique. The EIQ-AV was the first inventory to assess exercisers' use of imagery, but was limited by its inability to expand beyond aerobic exercising populations as it was not validated for use with those individuals who engaged in other forms of exercise.

Using a grounded theory approach, Giacobbi et al. (2003) expanded on the findings of Hausenblas et al. (1999) by conducting interviews with 16 female exercisers involved in several different forms of exercise (e.g., aerobics, running, softball, swimming, weightlifting, etc.). The interview guide consisted of broad open-ended questions followed by specific probes investigating participants' experiences using imagery relating to exercise. In addition, participants were asked to address questions concerned with the time of day, location, content, and function of mental imagery that they used, and lastly, questions were included to assess the functions of mental imagery in human performance proposed by Paivio (1985). Through this process, the authors

were able to extract eight higher order themes or types of imagery used by exercisers: exercise technique, aerobics routines, exercise context, appearance images, competitive outcome, fitness/health outcomes, emotions/feelings associated with imagery, and exercise self-efficacy. A number of parallels can be drawn between some of these themes and the types of images outlined by Paivio. Most notably those themes relating to technique, and routine represented the cognitive dimensions, while those associated with emotions, and fitness or competitive outcomes represented the motivational dimensions. Giacobbi et al. also replicated the finding that exercisers used imagery inside and outside of the exercise context.

Given the advances in the field since Hall's (1995) model of participation for motivation in exercise, Munroe-Chandler and Gammage (2005) proposed a conceptual model for exercise imagery which was based on the applied model of imagery use in sport (Martin et al., 1999). The model consists of: antecedents, the five types of imagery proposed by Paivio (1985) and Hall et al. (1998), cognitive and behavioural outcomes, efficacy beliefs, and potential moderating variables. The model proposes that the antecedents of setting, experience, goals, and intrinsic motivation lead exercisers to use one of the five types of imagery which in turn lead to behavioural outcomes (e.g., initiation or adherence to exercise) or cognitive outcomes (e.g., intention or motivation). Furthermore, the relation between imagery and the behavioural/cognitive outcomes is mediated by efficacy beliefs (efficacy expectancy, outcome expectancy, outcome value, and self presentational efficacy) and moderated by several individual factors (e.g., gender, age, imagery ability, etc.). The authors stated that the model can be used to test practical implications and that the current exercise imagery inventories need to be

revisited in order to assess the emerging themes found by Giacobbi et al. (2003) rather than focusing on the broad themes of energy, appearance, and technique (Hausenblas et al., 1999).

Self-Determination Theory

Self-determination theory (SDT; Deci & Ryan, 2000, 2002; Ryan & Deci, 2000a) is one of the most commonly cited theories of motivation in behavioural psychology research. SDT can be used to describe the extent to which behaviours are autonomous (i.e., self-determined) and as a result, it is often used as the theoretical basis for studies examining exercise participation motives (Hagger & Chatzisarantis, 2007).

Central to SDT is the distinction between intrinsic and extrinsic motivation (Ryan & Deci, 2000b). Intrinsic motivation refers to being motivated to engage in behaviours because they are inherently interesting or enjoyable, whereas extrinsic motivation refers to the engagement in behaviours in order to achieve some separable outcome (e.g., reward). Furthermore SDT proposes that behaviours vary along a continuum anchored at one end by intrinsic motivation and at the other by amotivation (i.e., an absence of motivation), with the four dimensions of extrinsic motivation (integrated regulation, identified regulation, introjected regulation, and external regulation) representing varying degrees of autonomy between the two extremes (Figure 5).

The four dimensions of extrinsic motivation are classified by the degree to which they are internalized by the individual; internalization is referred to as the process in which collectively endorsed behaviours become personally endorsed or internalized (Deci & Ryan, 2000). Additionally, the more internalized an extrinsically motivated behaviour, the more volitional or autonomous it becomes (Kingston, Harwood, & Spray,

2006). Of the four dimensions of extrinsic motivation, integrated regulation represents the most internalized form. Individuals exhibiting this form of regulation recognize the importance of the behaviour and engage in it volitionally. Identified regulation is evident in individuals who recognize the importance of an activity and consequently participate in it out of choice; however these individuals may not find the activity intrinsically enjoyable. Introjected regulation is reflected in individuals who participate in an activity in order to avoid some undesirable outcome or in order to achieve approval, ego enhancement, or a sense of pride. Lastly, the least autonomous form of extrinsic motivation is external regulation, which is behaviour that is controlled by external sources through the administering of material rewards or sanctions (Deci & Ryan, 2000).

Component Theories

SDT is a meta-theory consisting of organismic integration theory, causality orientations theory, cognitive evaluation theory and basic needs theory to explain the complex nature of human motivation (Hagger & Chatzisarantis, 2007). Organismic integration theory postulates that individuals are inherently driven to internalize their ongoing life experiences (Deci & Ryan, 2002). Through the facilitation of external prompts from significant others or from important external sources, an individual may internalize the importance of an activity in which they were not initially intrinsically motivated to participate. As noted in organismic integration theory, the interplay between social context and internal resources is critical in understanding an individual's motivation to engage in a given activity. Accordingly, causality orientations theory was developed in order to categorically account for the inner resources developed by an individual through prior interactions in social contexts. Deci and Ryan (1985) forwarded

three motivational orientations that a person may take toward the social world; these *causality orientations* differ between individuals and their categorization helps to index people's tendencies towards intrinsic motivation. Furthermore, it was hypothesized that the pattern in which the autonomy, controlled, and impersonal orientations are exhibited within an individual will dictate the extent to which the individual's motives are autonomous.

Cognitive evaluation theory (Deci, 1975) was the first of the four component theories to develop and therefore provides the foundation for SDT. Cognitive evaluation theory was initially developed to explain the negative influence of external rewards on intrinsic motivation and was based on the views of deCharms (1968), who described intrinsic and extrinsic motivation relative to an internally or externally motivated controlling influence or perceived locus of causality. An internal perceived locus of causality would enhance intrinsic motivation through the support for the innate human need for autonomy, while control considered to be external would thwart autonomy by undermining intrinsic motivation given control over the behaviour would be held by an external source. In addition to autonomy, cognitive evaluation theory proposes that humans have the basic psychological need for competency, and as a result perceived competency in an activity can influence an individual's intrinsic motivation to engage in that activity. Essentially, if a particular event were to lessen an individual's perceived competency for a given activity their intrinsic motivation to engage in said activity would be diminished and conversely, an event which increases perceived competency would increase intrinsic motivation to participate in the activity (Deci, 1975).

Basic needs theory. Integral to SDT is the belief that certain conditions are necessary for the healthy psychological growth and well-being of people's personalities and cognitive structures (Hagger & Chatzisarantis, 2007). The drive to satisfy these conditions or *needs* is innate in all individuals regardless of their culture or stage of development; consequently, human beings tend to gravitate towards situations or events that foster the satisfaction of these needs (Deci & Ryan, 2002). SDT proposed that three such needs exist: autonomy, competence, and relatedness (Deci & Ryan, 2000). As alluded to above, autonomy refers to being the perceived origin or source of one's own behaviour (deCharms, 1968). Autonomy is evident in behaviours that are valued by the individual and engaged in out of expression of the self (Deci & Ryan, 2002). Autonomous behaviours are distinct from independent behaviours in that they may be influenced by an external source, though in order to be autonomous the behaviour must be in agreement with the values endorsed by the individual. Competence refers to feelings of effectiveness in association with an individual's interaction with the social environment, and in experiencing opportunities to exemplify confidence in one's global capacity (Deci, 1975; Deci & Ryan, 2002). Competence is not merely an attained skill or ability, but rather a global sense of confidence in action. Lastly, relatedness refers to having a sense of belonging and connection to other individuals and is reflected in the tendency to feel integral and connected to the lives of others (Deci & Ryan, 2002).

Deci and Ryan (2000) described the needs for autonomy, competence, and relatedness as "innate psychological nutriments that are essential to ongoing psychological growth, integrity, and well-being" (p. 229). A eudaimonic perspective of well-being was emphasized, whereby well-being was likened to the realization of true

potential or full functionality (Ryff & Singer, 1998). Such a perspective allowed for the assessment of well-being through a variety of psychological constructs (e.g., positive affect or mental health). Research examining the influence of need satisfaction on well-being has proven the efficacy of this component of SDT from three main areas: fluctuations in well-being as a result of need thwarting, goal pursuits and the influence of goal attainment on well-being, and the cross-cultural applicability of the hypothesis that need satisfaction is essential to well-being (Deci & Ryan, 2002).

Basic needs theory and children in sport. In addition to overall well-being, Deci and Ryan (2007) stated that the presence of environmental conditions that support the needs for autonomy, competence, and relatedness facilitates intrinsic motivation, and that those situations which prevent the satisfaction of those needs would impede intrinsic motivation. Noting the implications that basic needs theory may have in the facilitation of intrinsic motivation in sport and exercise contexts, researchers began to investigate motivation in these domains using an SDT and basic needs theory framework with both adults (Wilson, Rogers, Rodgers, & Wild, 2006) and children (Gagné, Ryan, & Bargman, 2003).

One such study with children was conducted by Gagné et al. (2003), who examined the effect of perceived autonomy support from parents and coaches on intrinsic motivation and the influence of need satisfaction in the day-to-day well-being of youth and adolescent competitive gymnasts. Participants were asked to complete questionnaires assessing several aspects of subjective well-being in addition to completing diary entries outlining fluctuations in their day-to-day motivation over a four week period. The results indicated that parents and coaches were able to enhance self-

determined motivation through fostering an autonomy-supportive motivational climate, and furthermore that the sense of well-being felt by the gymnasts from pre to post practice was influenced by the extent to which this climate supported the needs for autonomy, relatedness and competence.

Coatsworth and Conroy (2009) expanded these findings by testing relationships in their conceptual model of the effects of coaching on youth development (Conroy & Coatsworth, 2006). Based on SDT, the model postulated that perceived behaviour and need satisfaction from coaches influences youth's self-perceptions (i.e., perceived competence and self-esteem), which in turn influence youth developmental outcomes. Specifically, Coatsworth and Conroy tested the influence of autonomy-supportive coaching behaviours on psychological need satisfaction and the positive developmental outcomes of initiative, identity reflection, and identity exploration in a sample of youth swimmers. The results generally supported the relationships predicted by the model, as autonomy supportive coaching behaviours predicted the needs for competence and relatedness. Further, competence predicted certain aspects of self-perceptions and in turn, the youth developmental outcomes of initiative and identity reflection.

In accordance with SDT, human beings are inherently attracted to environments which foster the satisfaction of the three psychological needs (Deci & Ryan, 2002). Therefore, the above two studies provide practical implications for the development of coaching interventions which could potentially target need satisfaction in practice or competition via autonomy supportive coaching behaviours. Such an intervention would theoretically increase youth athletes' intrinsic motivation to participate in sport. As participation in organized sport is the main avenue through which Canadian youth are

physically active (AHK, 2010), these findings prove the utility of using a SDT framework for the examination of factors that may influence a young athlete's intention to return to sport.

Leisure-Time Physical Activity and Active Play

One potential indicator of exercise intentions is leisure-time physical activity, that is, exercise, sports, and physically active hobbies which are engaged in during one's free time (Centers for Disease Control and Prevention; CDC, 2009). In adults, leisure-time physical activity has been associated with the reduction of coronary heart disease (Lakka et al., 1994), metabolic syndrome (Laaksonen et al., 2002), cancer (Martinez et al., 1997), and overall mortality (Kujala, Kaprio, Sarna, & Koskenvuo, 1998). As it is known that a sedentary childhood could lead to a lifetime of inactivity and related health risks (Perry et al., 1990), the examination of leisure-time physical activity behaviours in children has recently received increasing attention. While most adults' leisure-time physical activity pursuits are in the form of purposeful exercise (i.e., structured leisure-time physical activity), children are not afforded those same exercise opportunities. In fact, children's main outlet for physical activity comes from organized sport (AHK, 2010). Despite this, however, many children (88%) are still not meeting the recommendations for daily physical activity (CFLRI, 2009) of 60 or more minutes per day. Moreover, as leisure-time physical activity may be delineated to include both structured and unstructured (i.e., active play or active transport) forms of physical activity in children (Veitch et al., 2008), the examination of purposeful exercise and sport participation may be overlooking a significant component of leisure-time physical activity behaviours in children, that is, unstructured physical activity in the form of active play. Therefore, the examination of

factors which may influence participation in active play for all children regardless of organized sport enrolment is required.

One such factor could be imagery (Hall, 1995, 2001). In one of the early studies on exercise imagery, Gammage, Hall, and Rodgers (2000) examined the differences in the frequency of imagery used by high and low frequency exercisers (i.e., those who engaged in leisure-time physical activity through deliberate exercise). The results supported those from the sport research domain, which indicated that elite athletes use imagery more frequently than non-elite athletes (Salmon et al., 1994) in that high frequency exercisers used imagery significantly more than low frequency exercisers. It should be noted however, that based on Hall's (1995) model, imagery was hypothesized to influence exercise behaviour indirectly through the construct of self-confidence (in this case, self-efficacy). This limitation was addressed by Rodgers et al. (2002) in their examination of the influence of exercise imagery on exercise intention. The authors administered two versions of the EIQ to a large sample of university students and the results confirmed their hypothesis that imagery was significantly related to exercise intention, and that it was statistically distinct from self-efficacy. In so doing, Rodgers et al. provided the first link for the efficacy of imagery use as a means to increase exercise behaviour. Although these results are well established in adults (Kossert & Munroe-Chandler, 2007), an examination of imagery as it relates to the leisure-time physical activity, more specifically, active play behaviours of children has yet to be conducted.

Leisure-time physical activity and children. Leisure-time physical activity is freely chosen and under the control of the individual, therefore self-determination is paramount in the motivational process compelling an individual to engage in these

behaviours. Recent research has examined structured and unstructured forms of leisure-time physical activity in children using SDT as a theoretical foundation predominantly within the context of school-based physical education, however, it should be noted that a delineation between the two forms of leisure-time physical activity was not acknowledged in these studies (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Ntoumanis, 2001; Shen, McCaughtry, & Martin, 2007; Standage, Duda, & Ntoumanis, 2003). In particular, Hagger et al. (2003) integrated SDT with another commonly cited theory of motivation (i.e., the theory of planned behaviour; Ajzen, 1991) to explain how autonomy supportive behaviour by physical education teachers could influence intrinsic motivation for leisure-time physical activity outside of school. A trans-contextual model (incorporating aspects of SDT and the theory of planned behaviour) was created and tested using path analysis. A direct influence of perceived autonomy support on intrinsic motivation for leisure-time physical activity was revealed. Further, attitudes and perceived behavioural control were found to mediate the relation between intrinsic motivation and intention to engage in leisure-time physical activity. As a result the trans-contextual model was found to have some use in describing the motivational processes that lead from autonomy support, through intrinsic motivation, to intention, and ultimately, actual engagement in leisure-time physical activity behaviours. Thus, it was shown that aspects of SDT can be used to explain the behavioural and motivational processes used by children who engage in leisure-time physical activity (Hagger et al., 2003).

Incorporating basic needs theory, Standage et al. (2003) investigated the influence of the physical education environment on psychological need satisfaction (Deci & Ryan,

2000) and the subsequent impact on children's intention to engage in leisure-time physical activity. The results were consistent with the authors' hypothesis that based on the tenets of SDT; a less controlling more autonomy supportive physical education environment would foster a greater sense of autonomy, competence, and relatedness among students. It was further concluded that all three psychological needs predicted self-determined motivation to engage in leisure-time physical activity outside of the physical education context. However, relatedness and competency were found to be better predictors than autonomy. This finding complemented those of Ntoumanis (2001) who found a significant positive relation between both competence and relatedness with intrinsic motivation to engage in physical activity, however no such relation was found for autonomy. Ntoumanis attributed the absence of a relation between autonomy and physical education to the inability of physical education teachers to support autonomy while maintaining control of their class.

Although the principles of basic needs theory and SDT have proven to be useful in the examination of leisure-time physical activity in adults (Wilson, Rodgers, Murray, Longley, & Muon, 2006) and children (Hagger et al., 2003; Standage et al., 2003), existing research has yet to fully investigate specific factors that may lead to the satisfaction of these needs within the context of leisure-time physical activity. Moreover, as noted above, extant literature investigating BNT and leisure-time physical activity has overlooked the delineation of structured and unstructured forms of leisure-time physical activity. As the structured (i.e., sport participation) form has previously been examined within the context of BNT and children, there exists the need to examine the exclusive influence of active play behaviours on basic need satisfaction. In line with exercise

imagery research with adults (Giacobbi et al., 2003; Hausenblas et al., 1999) and leisure-time physical activity research with children (Hagger, et al., 2003; Standage et al., 2003), an examination of children's use of imagery relating to active play is required, moreover a basic needs theory approach seems to provide an appropriate theoretical basis from which to conduct such an examination.

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FIGURE CAPTIONS

Figure 4. An Applied Model of 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, 1999, *The Sport Psychologist*, 13, p. 248.

Figure 5. Schematic Representation of Self-Determination Theory

Adapted from “Intrinsic Motivation and Self-Determination in Exercise and Sport,” by M. S. Hagger and N. L. D. Chatzisarantis (Eds.), 2007, Champaign, IL: Human Kinetics, p.8.

FIGURES

Figure 4.

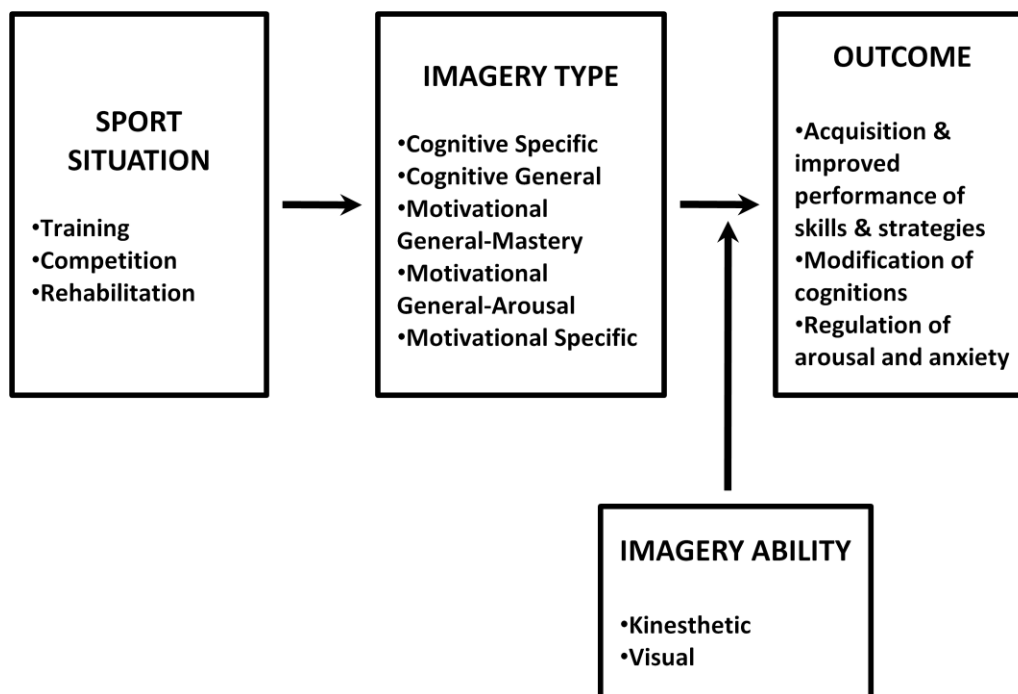
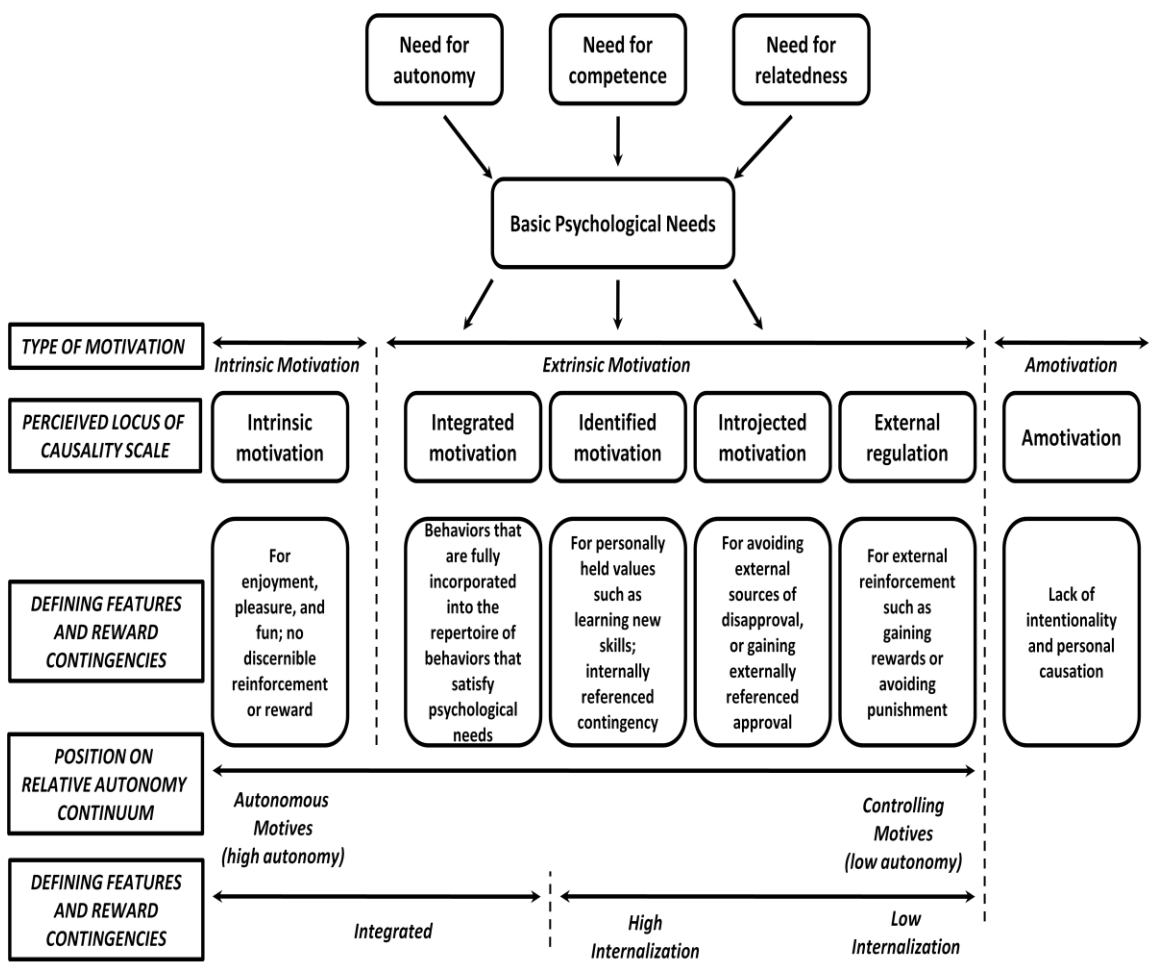


Figure 5.



APPENDICES

APPENDIX A

Interview Guide

Imagery Use in Children's Leisure-Time Physical Activities – Study 1**Interview Guide****1. Welcome:**

- a. Thank you for taking the time to join the discussion group on imagery use in physical activity. My name is _____. Assisting me is _____.

2. Guidelines:

- a. Before we begin, let me suggest some ways in which the discussion will go smoothly. You will be audio-taped because we don't want to miss any of your comments. Be sure to speak loudly enough and only one at a time. We will use your first names here today, but in a report that we write after we collect all our data, your names will not be used so that no one will know who made the comments.
- b. My role is to ask questions and listen. I won't be participating in the conversation, but I want you to feel free to speak with one another. I will be asking about 6-8 questions and I'll be moving the discussion from one question to the next. We will be done in about 45 minutes. It is important that I hear from each of you because you each have different experiences when you are active. So if one of you is sharing a lot, I may ask if others have something to share as well. And if you aren't saying too much, I may ask if you have something to add. We've placed name cards on the table in front of you to help us remember each other's names.

3. Getting to Know You: (approx. 5 minutes)

- ▶ Let's find out some more about each of you by going around the table. Please state your name, age, and your favorite thing(s) to do outside other than any sport team that you play for (Each person needs to respond)

4. Overview of the topic:

- a. We want to hear how you use imagery when playing/moving (ball hockey, , swimming) — as compared to not moving (watching TV, playing video games, reading).
- b. Definition: Imagery is a mental skill that is used to create or re-create pictures and feelings in your mind.
- c. We've asked other kids, to share their ideas as well. You were selected because you are all active and like to work up a sweat.
- d. Earlier, we talked about some of the things you like to do while playing like, (give examples), are there any more examples of types of play that you think kids like to do?
- e. Today we'll be discussing what you picture in your mind (think about) about being active (playing); Close your eyes, imagine you are doing one of your favorite playtime activities that you just told us about, remember, try to avoid thinking about any team that you play on. I'll be asking questions such as how you would describe imagery, when you use imagery, why you use imagery and what you image. There are no right or wrong answers. Please feel free to say what you like, even if it is different from another person's point of view.

5. Key Questions:

A) Social (relatedness): When you picture yourself playing (doing those activities), who do you see yourself with?—(always friends or with others in the probe)

Probes: Who are they?

Probes: Are they your friends?

Probes: How many?

Probes: Why do you see these people? (do your friends also enjoy that activity)?

Probes: Describe what you are seeing in your image with others and which emotions you feel while you are picturing this.

Probes: When do you picture this in your head? (while in class, while at recess, while doing it, when watching TV, prior to the activity).

B) Fun (autonomy): When you picture yourself playing/doing the activity, why do you picture these activities?

Probe: Describe the feelings you have when you picture yourself doing the activity.

Probe: When do you picture this?

C) Capability (competency): When you picture yourself playing/doing the activity, what do you see yourself doing? (how are you moving, what motions are you doing, what is your body doing, how is the body moving)

Probe: Why do you image this? (because I can do it)

Probe: Do you picture your body moving?

Probe: How is your body moving?

Probe: Do you ever imagine doing something for fun that you have never done before?

Probe: In your picture are you good?—how good are you at it?

Probe: Describe how you are feeling when you are picturing this activity.

Probe: What does your body feel in these images?

6. Summary:

- ▶ Summarize the most important findings (refer to assistant). Capture common themes but acknowledge different points of view.
 - Probes: Is there anything that we should have talked about and didn't? Did we miss anything?

APPENDIX B

Parent Information Letter and Consent Form



**PARENT/GUARDIAN LETTER OF INFORMATION FOR CONSENT
TO PARTICIPATE IN RESEARCH**

Imagery Use in Leisure-Time Physical Activity – Study 1

Your child is being asked to participate in a research study conducted by Dr. Krista Chandler from the Faculty of Human Kinetics at the University of Windsor in collaboration with Dr. Craig Hall from the School of Kinesiology at the University of Western Ontario. Imagery use in leisure-time physical activity (non-organized sport) will be investigated.

If you have any questions or concerns about the research, please feel free to contact

Dr. Krista Chandler

(519) 253-3000 (x2446)

chandler@uwindsor.ca

OR

Eric Nadalin

(519) 253-3000 (x4998)

nadaline@uwindor.ca

PURPOSE OF THE STUDY

The purpose of the study is to investigate the use of imagery by children in leisure-time physical activity aged 7-8, 9-10, 11-12, and 13-14 years using focus group interview sessions. Imagery is defined as creating or recreating experiences in one's mind.

Leisure-time physical activity is any physical activity conducted in one's free time and is not organized (for example, riding one's bike, skipping, swimming).

PROCEDURES

If you volunteer your child to participate in this study, he/she will be asked to:

Participate in a Focus Group

Children from various Lancer Camps programs will be asked to participate in focus groups which are small group interviews. You will be asked for consent, and assent will be obtained from your child. The children will be assigned to one of sixteen focus groups, dependent upon the participant's age and gender. Each focus group will consist of 6-8 same gender participants within a two-year age span. The focus groups will be led by a moderator, with the help of a technical assistant. The technical assistant will be responsible for audio taping the sessions as well as keeping accurate field notes. Audio taping is necessary in order to capture all discussion with respect to imagery use. The interview session will be structured around 3 primary questions; what activities do you see yourself doing when you image, who do you see when you image (e.g., friends, parent), and why do you picture these activities. Specific probes will be used in order to gain a greater understanding around ideas coming from the focus groups. The focus group sessions will be conducted immediately following the Lancer Camps program, will

be conducted at the university in the St. Denis Center/ Human Kinetics Building, will be 45-60 minutes in duration, and will ask questions that are appropriate for the age of the participants.

Be Audio Tape Recorded

Audio taping is a voluntary procedure and your child is free to withdraw at any time by requesting that the taping be stopped. If your child does not wish to be recorded they will not be part of the study. They will wait in the St. Denis centre with a camp instructor for their parent/guardian to pick them up. Your child's name will not be revealed to anyone and taping and listening to the tapes will be kept confidential. Tapes are filed by number only and stored in a locked cabinet in the lead researcher's office. The audio tapes are for research use only. The tapes will be appropriately disposed of after the study is completed.

POTENTIAL RISKS AND DISCOMFORTS

There are no known or anticipated risks from discussing previous and current imagery use in physical activity.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

This study is part of a larger study examining imagery use in leisure physical activity. The information gained from this study may be used in subsequent studies. The researchers may gain valuable insight regarding children's use of imagery in leisure-time physical activity.

COMPENSATION FOR PARTICIPATION

Participants will receive either a water bottle and a back pack (approximately a \$10.00 value) or a gift certificate of \$10.00 value to a local sporting goods store for their

participation in this project. You will be asked to indicate on the accompanying consent form which your child would prefer.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with your child will remain confidential and will be disclosed only with your permission. All responses from the focus group session will be kept in strict confidentiality. If we find information we are required by law to disclose, we cannot guarantee confidentiality. The information obtained from the study will not be used for any purpose other than the research and the communication of the results. All information obtained from the focus group session will be kept in a locked cabinet in the lead investigator's office. There is no access to this cabinet by anyone other than the investigator. The audio tapes will be appropriately disposed of once the study is completed. There is the potential that confidentiality could be violated by someone participating in the focus groups. We are capable of promising confidentiality of information but cannot promise that the other participants will observe each other's privacy.

PARTICIPATION AND WITHDRAWAL

Participation in this study is voluntary. Your child can choose whether to be in this study or not. If your child volunteers to be in this study, he/she may withdraw at any time. You may remove your child's data from the study. Your child may also refuse to answer any questions he/she doesn't want to answer and still remain in the study.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

If you wish to be informed of the results of this study you can feel free to contact the University of Windsor Research Ethics Board.

Web address: uwindsor.ca/reb

Date when results are available: June 4, 2011

SUBSEQUENT USE OF DATA

This data will be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue your child's participation without penalty. If you have questions regarding your child's rights as a research subject,

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 C

Participant Assent Form



Assent Form

Imagery Use in Leisure-Time Physical Activity

Purpose of the Study

We would like to invite you to participate in a study that is going to look at the pictures that come up in your mind while at play, like when you are creating or recreating a situation in your mind. I would like you to tell me about the pictures that come up in your mind while playing or doing physical activities (playing where you would work up a sweat). This will be a group activity with other children your age.

Confidentiality

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

Recording

Everything we talk about will be recorded. This will help me remember what you and the others have told me about imagery.

Participation

You can ask questions at any time, now or later. Your mom and/or dad have said it is okay for you to talk to me about the pictures in your mind when you think about playing and doing physical activities. Do you think that you would like to talk to me about it? You won't get into any trouble if you say "no." If you don't want to be in the study, just say so, and even if you say yes now, you can still change your mind later. If you decide you would like to talk to me about the pictures that come up in your mind, you can feel free to stop talking at any time, and you don't have to answer any question you do not want to answer. It's entirely up to you. Would you like to tell me about the pictures that come into your mind during activities?

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

Signature

Date

Witness

VITA AUCTORIS

NAME: Eric Nadalin

PLACE OF BIRTH: Windsor, Ontario, Canada

YEAR OF BIRTH: 1987

EDUCATION: University of Windsor, Windsor, Ontario
2009-2011, Master of Human Kinetics

The University of Western Ontario, London, Ontario
2005-2009, B.A. Honors Specialization in Kinesiology

Belle River District High School, Belle River, Ontario
2001-2005