Evaluation of Girls Rock: An Intervention Program for Girls in Grades 4, 5 and 6

by

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Abstract

Girls Rock is a community-based program designed specifically for the needs of girls in Grades 4, 5 and 6. This program aimed to increase psychological and physiological components through classroom and physical activity based sessions over an 8-week period. Specifically, a total of 23 girls, from four different Boys and Girls Club locations, participated in Girls Rock, and the program objectives were to increase positive body image, self-esteem, self-efficacy and fundamental movement skills. The present research study involved conducting an outcome evaluation to assess the effectiveness of Girls Rock in achieving its objectives. Data collected pre- and post-intervention revealed that participation in Girls Rock significantly increased positive body image, self-esteem, self-efficacy, and fundamental movement skills. This information can be used to attain the future goals of recruiting more participants, retaining those already involved, and expanding to other clubs.

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Chapter 1: Introduction

There are many benefits associated with physical activity (PA) in childhood and youth, such as physical health and improved psychological development (Janssen & LeBlanc, 2010). Even with a substantial amount of documented benefits, the majority of youth are not meeting the recommended levels of PA. Only 9% of Canadian youth are physically active for 60 minutes per day, leaving 91% falling short of the recommendations of the Canadian Physical Activity Guidelines (Gray et al., 2014). These statistics raise concern especially for girls, who are globally less active than boys (Gray et al., 2014). A 5-year longitudinal study investigated the developmental trends in PA of 5863 youth, aged 11-12 (Brodersen, Steptoe, Boniface, & Wardle, 2007). Over the 5 years, according to their data on vigorous activity engagement, the decline in PA was significantly larger in girls (46%) compared to boys (23%), which shows that girls have a steeper decline in PA from youth to adolescence. This global decline in PA and disparity between girls and boys can also be seen on the provincial level (Thompson & Wadsworth, 2012). Specifically, in Nova Scotia it is apparent that, when comparing young children with adolescents, daily activity decreases with increasing age (CFLRI, 2015). Statistics from Nova Scotia indicate that 80% of girls in Grade 3 meet the PA guidelines; however, by Grades 7 and 11 only 13% and less than 1% of girls, respectively, are meeting these guidelines and are considered active (Thompson & Wadsworth, 2012). Promoting PA early in life is very important to discontinue the trend of the low rates of PA in young girls around the world, not only for the positive effects of youth on short-term health, but also long-term health (Hallal, Victora, Azevedo, & Wells, 2006).

Higher levels of PA in children are directly linked with improved physical development, including fundamental movement skills (FMS; Logan, Robinson, Wilson & Lucas, 2012; Morgan et al., 2013). FMS include locomotor skills (e.g. running, jumping, and hopping) and object control skills (e.g. catching, throwing, and kicking) (Gallahue, Ozmun, & Goodway, 2012), which are key elements of physical development and considered to be the building blocks for all PA. Each of the movements serve as baseline skills that have the ability to develop into specialized movement sequences, which are necessary for organized and non-organized PA participation (Clark & Metcalfe, 2002). It has been suggested by Gray et al. (2014) that youth should have more opportunities to participate in organized PA to develop these skills. FMS are considered to be a necessary first step for engaging in sports, which in turn may lead to a lifelong love and appreciation of PA.

Although PA levels were not measured, or an objective, in this study, having PA based sessions may have had a benefit on the participants. For example, another area shown to have strong correlations with PA, as previously mentioned, is psychological development. Psychological development includes many components, such as cognitive, emotional, intellectual, and social functioning (Psychological Development, 2016), including body image. Body image is characterized by an individual's thoughts and feelings about his or her body (Grogan, 2007). These perceptions can affect other psychological aspects, such as self-esteem. Self-esteem is an individual's evaluation of their worth, value, or importance (Blascovich & Tomaka, 1991). Body image perception has consistently been documented as the most significant single predictor of self-esteem, with a correlation of about .62 (Harter, 2000). Therefore, literature suggests that by

taking action to improve body image there will also be an increase in self-esteem (McCabe & Ricciardelli, 2003). This statement is supported through research conducted by Richardson and Paxton (2010) who evaluated the effectiveness of a school-based program called Happy Being Me. This program aimed to improve the body image and self-esteem of 194 girls in Grade 7 from two different schools. Results indicated more positive changes in self-esteem for intervention group participants, who participated in the three 50-minute body image sessions, compared to the control group who had no sessions. Therefore, while educating the girls on body image, the Happy Being Me program was also increasing self-esteem. Since PA increases both body image and self-esteem, which in turn positively affect each other, PA may be an effective way to increase psychological development in young girls.

Another component of psychological development that has shown to be positively impacted by PA is self-efficacy (Dishman et al. 2004). Self-efficacy involves the beliefs that one can achieve a desired outcome, and is a key component in the development of human behaviours (Bandura, 1986). Self-efficacy develops early in life and is important to take notice of in young girls because it may affect many aspects of life, such as how they deal with adversity, develop in academics, and establish peer relationships (Corwyn & Bradley, 2001). Many researchers argue that one should place less value on the role of "talent", and innate ability (Dweck, 2000), and place more value on role of self-regulation, which are adapted thoughts, feelings and actions to attain personal goals (Maddux, 2002). This is important because highly self-efficacious individuals tend to self-regulate, and typically choose to perform more challenging tasks, which are then

embarked upon with drive and persistence, leading to the feeling of fulfilment (Bandura, 1997).

With this data, it is apparent that increasing FMS, body image, self-esteem, and self-efficacy in girls at a young age could lead to lifelong health benefits. One way to generate this change is through community-based programs. Although these programs do exist, many are producing positive change that is not recognized by the public, other professionals in the field, or intended users (Thompson & McClintock, 2000). The issue is not in failing to produce desired results, but in the absence of evidence that the program is having beneficial effect (Schalock, 2001; Thompson & McClintock, 2000). Such programs can provide this evidence, through facts and figures, by including one key component: evaluation (Thompson & McClintock, 2000). The specific evaluation in this thesis will include questionnaires and observational assessment to assess the effectiveness of Girls Rock in producing change in body image, self-esteem and self-efficacy.

Pearson, Braithwaite, and Biddle (2015) performed a meta-analysis of program evaluations to examine the effectiveness of such interventions. This random effects meta-analysis included intervention studies that aimed to increase PA in girls aged 5-11 years. Results showed that interventions using multiple components (e.g. programs that include activities on body image and self-esteem, rather than body image alone) were most effective for producing positive change in behaviour. This was especially true for interventions that included educational components, and when the components were mutually beneficial and interconnected (Pearson, Braithwaite, & Biddle, 2015). The curriculum of the program in evaluation for this research study, Girls Rock, includes components that are mutually beneficial and interconnected.

Girls Rock

The North Dartmouth Boys and Girls Club (BGC) of Greater Halifax recognized a gap in community-based PA programming targeting the specific needs of female youth. BGC's are community-based, non-profit organizations with a mission statement, "To provide a safe, supportive place where children and youth can experience new opportunities, overcome barriers, build positive relationships and develop confidence and skills for life" (BGC About Us). Combining the aims of female youth and the organization's mission, the lead staff member at Dartmouth North BGC developed an eight-week community-based intervention program for girls in Grades 4, 5 and 6, called Girls Rock. Girls Rock expanded to three other clubs (Dartmouth East, Cole Harbour and Humber Park) in March 2017, when this evaluation began.

The program aims to actively engage girls and is unique in that it incorporates healthy development focused classroom sessions in addition to the PA sessions. Girls Rock focuses on improving FMS, body image, self-esteem, and self-efficacy, which is beneficial because, as previously mentioned, the most effective interventions include multiple, interrelated components. Four activities a week, for one hour and a half, was dedicated towards improving each of these objectives (one activity for each). All of the program sessions were delivered by the same person in each location. Literature shows that having flexibility within the sessions are the most successful with girls-only PA programs (Pearson, Braithwaite, & Biddle, 2015). The specific curriculum for these sessions were flexible in order to adapt to where the girls were in terms of their FMS levels and what the participants wanted to do. The lesson plans were drawn from existing resources and were adapted based on the participants' needs.

I became involved with the Girls Rock program when their staff reached out to Dalhousie faculty for input. Initially, I attended meetings to learn and provide feedback. I was very interested in the program and we, the staff and I, decided it would be a great idea to evaluate the program to see whether it produces its desired results.

Purpose of the Study

The purpose of this study was to evaluate the impact of Girls Rock on physical and psychological components among girls in Grades 4, 5 and 6. More specifically, in March of 2017, 23 girls took part in Girls Rock. Girls Rock had the objectives of increasing FMS, body image, self-esteem, and self-efficacy, and were assessed pre- and post-intervention to examine any changes.

Primary Evaluation Question

Did participation in the Girls Rock program have a positive effect on FMS, body image, self-esteem, and self-efficacy for girls in Grades 4, 5 and 6?

Chapter 2: Review of Literature

The purpose of this chapter is to provide context and justify the research conducted. This literature review gathered information relevant to the variables and hypotheses of this study. The chapter begins by providing information regarding PA, followed by a specific focus on girls. Next, support for the importance of interventions targeting FMS, body image, self-esteem, and self-efficacy for young girls is presented, with an exploration of evaluations conducted on programs similar to Girls Rock. Finally, the purpose and hypotheses for the current research project are stated. The information gathered in this review informed the current study.

Physical Activity in Youth

PA is generally promoted in youth because it is one of the most effective ways for individuals to become more healthy and productive (ParticipACTION, 2016). More specifically, research has linked increased levels of PA to numerous physiological benefits, such as lowering levels of cardiovascular disease and obesity, and psychological benefits, such as lowering levels of anxiety, and depression (Biddle, Gorely, & Stensel, 2004; Janssen & LeBlanc, 2010). Despite these well-documented positive effects, the low levels of PA in youth have become a national (ParticipACTION, 2016) and global (Hallal et al., 2012) concern. In Canada, only 9% of 5 to 17 year olds are meeting the PA guidelines; this means that 91% of youth are not getting 60 minutes of moderate-to-vigorous PA (MVPA) per day (ParticipACTION, 2016). The ParticipACTION Report Card has shown year after year, since 2011, that very few children meet this recommendation. This is problematic, not only in the short term but also in the long term because youth PA levels have been shown to influence adolescent and adult PA, and thus

health outcomes in older demographics (Hallal et al. 2006; Telama et al., 2005). Adding to these concerns, literature has consistently shown that PA levels decline with age (Chung, Cockrell Skinner, Steiner, & Perrin, 2012), with the rate of sufficient PA falling from 14% in those aged 5-11 to 5% in those aged 12-17 (ParticipACTION, 2016). This means that the already low levels of PA become even lower. Gender also plays a role in PA levels, where females show significantly lower levels of PA than males.

Physical Activity in Girls

Literature on PA in youth reveals that girls are significantly less active than boys (Chung et al., 2012). A major contribution to this gender difference comes from girls in Grade 7 who are 22% less active than boys (Thompson et al., 2005). Girls Rock targets girls in Grades 4, 5 and 6, which may help to positively change their behaviours before reaching Grade 7, the point in a females life that reportedly has the steepest decline in PA (Telama & Yang, 2000).

CFLRI (2015) gathered more recent data illustrating a decline in PA. Results revealed that youth aged 5-19 took less average daily steps in 2014-2015 compared to 2006-2008 (CFLRI, 2015). In addition, they found that Atlantic youth consistently take less steps than the national average, and that young females take less steps on average compared to their male counterparts (CFLRI, 2015). Studies from 1997 onward have consistently revealed that the decline in PA levels is greater in girls than boys (Dumith, Gigante, Domingues, & Kohl, 2011). This claim is supported by a 5-year longitudinal study, of 5863 youth aged 11-12 (Brodersen, Steptoe, Boniface, & Wardle, 2007). As a way to assess developmental trends in PA they collected data, once a year for 5 years, on the number of days per week participants engaged in vigorous activity, meaning how

many of the last seven days had their PA led to sweating and heavy breathing. Results showed that males exercised 0.99 (SE=0.043) days a week more than their female counterparts (p<0.001). In both genders there was a decrease with age in the number of days participants were vigorously active a week. However, there was a steeper average decline in girls (-1.82 days, SE=0.072) than boys (-1.06 days, SE=0.068) throughout the course of the study (p<0.001). The researchers concluded that over five years girls have a larger decline in PA (46%) compared to boys (23%).

Dumith et al. (2011) also conducted research recognizing the high decline of PA levels in young girls as they age. A search of databases found 26 longitudinal studies meeting their inclusion criteria, which included PA measurements at two different points in time. Results of these studies consistently found that the decline in PA starts at a younger age for girls than boys. It was concluded that more interventions should be put into place that attempt to attenuate the PA decline in young girls.

Fundamental Movement Skills

Interventions targeting young girls could include activities that improve FMS. Research has shown a positive relationship between FMS competency and PA participation (Hardy, Reinten-Reynolds, Espinel, Zask, & Okely, 2012; Lubans, Morgan, Cliff, Barnett, & Oakely, 2010). Furthermore, youth who score high in FMS demonstrate only small decline in PA with age (Barnett, van Beurden, Morgan, Brooks, & Beard, 2009). FMS are "an organized series of basic movements that involve the combination of movement patterns of two or more body segments" (Gallahue & Donnelly, 2003, p. 52) and are considered to be the foundation of all PA. These movements activate large muscle groups and are often categorized as either locomotor skills (e.g., running,

jumping, and hopping) or object control skills (e.g., catching, throwing, and kicking) (Gallahue, Ozmun & Goodway, 2012). Early childhood is a critical time to develop these skills (Clark, 1994) as they are the building blocks that may lead to specialized movement sequences necessary for organized and non-organized PA participation in the future (Clark & Metcalfe, 2002). For example, kicking can be further refined to the specialized movement sequence of shooting a ball in soccer. Unfortunately, FMS proficiency in youth is very low (Hardy et al., 2012). Only 28% of Canadian children aged 8-12 year olds meet or exceed the minimum level of the physical competence domain of physical literacy, which assesses FMS (ParticipACTION, 2016). These undeveloped skills may continue into adolescence (Barnett et al, 2009); therefore, low FMS proficiency in youth contributes to the large number of adolescents with poor FMS proficiency (Hardy et al, 2012).

Quality instruction and practice must take place for the development of FMS because FMS proficiency is not 'naturally' acquired through maturational processes (Gallahue, Ozmun, & Goodway, 2012). It has been recommended that school- and community-based PA programs include FMS development sessions (National Association for Sport and Physical Education, 2004). Such interventions should include activities that are developmentally and instructionally appropriate for the population and specific goals of program.

Morgan et al. (2013) conducted a meta-analysis investigating the effectiveness of interventions that aim to improve FMS proficiency in youth. This study included 19 school, home, or community-based interventions that had clear intent to improve FMS proficiency of children aged 5-18. Results showed that school and community- based

intervention programs have significant effects on FMS proficiency. It was noted that all 19 studies had staff members who were trained on how to improve FMS in youth, and conducted age-appropriate FMS activities.

Another meta-analysis, conducted by Logan et al. (2012), had similar overall findings that FMS interventions are effective. However, Morgan et al. (2013) found greater effect size for locomotor skills compared to object control skills; this was in contrast to Logan et al. (2012), who found no difference. These inconsistent results may be due to the different age group examined by Logan et al. (2012), which were mainly pre-school aged children. Because locomotor skills improved more than object control skills, the findings may also indicate that improving object control skills could be more difficult compared to locomotor skills.

Following these meta-analyses, an evaluation was conducted on a multi-component school-based program called Project Energize. The objective of Project Energize was to improve FMS by increasing PA levels in children up to 8 years of age (Mitchell, McLennan, Latimer, Graham, Gilmore, & Rush, 2013). Teachers in the study were educated, through Developing Fundamental Movement Skills manuals, on different methods to develop FMS in youth. FMS proficiency was assessed using a pre-test-post-test design using the Test of Gross Motor Skills, Second Edition (TGMD-2; Ulrich, 2000) in 11 schools. While baseline measures showed that less than half of the children exhibited proficiency in many of the TGMD-2 components (i.e. performing at their age level), all skills were substantially improved following the intervention ($p<0.001$). Results suggest that taking part in the intervention program improved FMS.

The same measure of FMS was used in the current research project. Through information provided by a review of seven movement skill assessment tools (Cools, De Martelaer, Samaesy, & Andries, 2009) it was identified that the TGMD-2 is best suited for the specific target group and context of the current research project because it was specifically designed for intervention programs and has been used in many studies of this age group. The TGMD-2 (Ulrich, 2000), a revision of the original Test of Gross Motor Development (TGMD) (Ulrich, 1985), is a well-structured, standardized test that quantitatively measures gross movement abilities in the period of a child's life where the most dramatic gross movement skill development occurs, ages 3 to 10 years (Ulrich, 2000). The TGMD-2 assesses coordination of body movements during a task through observational assessment. The tasks are divided into two sections: locomotor and object control skills. The locomotor section includes six items: running, galloping, hopping, leaping, horizontal jumping and sliding. The object control section also includes six items: two-hand striking a stationary ball, stationary dribbling, catching, kicking, overhand throwing and underhand rolling. The curriculum of Girls Rock includes activities such as dodge-ball that incorporates several FMS (e.g., throwing and running), making the TGMD-2 an appropriate measure of FMS.

Body Image

As previously mentioned, there are relationships between regular participation in PA and psychological factors, such as body image. Since 1950, researchers have used over 16 definitions of body image that include reference to size perception accuracy, body esteem, and appearance orientation (Thompson, Heinberg, Altabe, & Tantleff-

Dunn, 1999). A definition of body image created by Grogan (2007) was used for this thesis: "a person's perceptions, thoughts, and feelings about his or her body" (p. 3).

During the 1970's there was an explosion on research pertaining to body image. During this time PubMed yielded 1250 citations relating to body image perceptions, which increased to 2766 citations in 1990 (Pruzinsky & Cash, 2002). This increase in body image literature was fueled by the concerns of negative effects caused by poor body image, especially in young girls (Pruzinsky & Cash, 2002). Negative body image perceptions are beginning as young as six years of age (Dohnt & Tiggemann, 2006) and this is an important issue to address early in youth because the number of girls dissatisfied with their bodies is on the rise. Dohnt and Tiggemann (2006) conducted a study including 128 girls, aged 5-8 years, and found that peer and media influences are significant predictors of body image awareness. They highlighted that young girls are living in an appearance culture, and the increased awareness of body image, through peers and media, are leading to low levels of body image.

The Girls' Circle is an intervention program that evidenced positive impact on body image for girls aged 9 to 18 (Steese, Dollette, Phillips, & Hossfeld, 2006). The study consisted of 63 girls from 9 separate groups, across the United States and Canada, who took part in a 90- or 120-minute session once a week for 10-weeks. The curriculum consisted of verbal and creative activities focused on the theme for the week. For example, week eight's theme was "body image and body messages". Objectives for this week were, "to explore messages girls encounter in everyday life; to critique the messages and their impact on girls' self-images; to empower girls to express their own messages or statements; and to brainstorm healthy responses to these messages".

Activities for this week included identifying magazine images that influenced body image perceptions and discussing what these images meant to the participants. A pretest-posttest design was employed using a paper and a pencil questionnaire, which is a commonly used method in research and evaluation. Unlike electronic questionnaires that require computer access and have lower response rates (Kongsved, Basnov, Holm-Christensen, & Hjollund, 2007), the paper and pencil format are inexpensive, convenient, easily implemented, and yield high response rates (Cancela, Ayan, & Castro, 2013; Loprinzi & Cardinal, 2011). Moreover, in contrast to interviews, paper and pencil questionnaires provide anonymity and encourage honest answers (Phellas, Bloch, & Seale, 2011). Body image was measured using the Body Parts Satisfaction Scale-Revised (BPSS-R; Berscheid, Walster, & Bohrnstedt, 1973) and will also be used in the current research study. This 15-item questionnaire measures the degree to which participants feel comfortable with their bodies. Results of the BPSS-R in Girls' Circle showed that average questionnaire scores increased by 5 points. This illustrated that taking part in the Girls' Circle program positively impacted body image for girls aged 9 to 18. The curriculum of Girls Rock includes sessions, such as "Silhouette Reflection" (which will be described more in the "methods" chapter of the thesis), which focuses on physical attributes, making the BPSS-R an appropriate measure of body image.

Body image correlates with self-esteem in youth (McVey, Davis, Tweed, & Shaw, 2002; Shisslak, Crago, Renger, & Clark-Wagner, 1998), especially girls (McCabe & Ricciardelli, 2003). In addition, body image has consistently been documented as the most significant single predictor of self-esteem (Harter, 2000). Because these two

variables are interconnected in young girls, a large amount of relevant literature involves them collectively.

Self-Esteem

Self-esteem is defined as, "the overall affective evaluation of one's own worth, value, or importance" (Blascovich & Tomaka, 1991, p. 115). This personal judgment of worthiness is a subjective feeling that develops from youth all the way to adulthood. Adolescent girls experience a rapid decline in self-esteem, where they may experience a "free-fall in self-esteem from which some will never recover" (Orenstein, 1994, p. 5); therefore, self-esteem is important to address at a young age.

Previous literature indicates that higher body image may lead to higher self-esteem; therefore, intervention programs that increase self-esteem in young girls are sometimes accomplished through activities that improve body image, such as the Happy Being Me program. Richardson and Paxton (2010) evaluated the effectiveness of Happy Being Me, a school-based program aiming to improve body image and self-esteem in girls in Grade 7. This study consisted of 194 girls from two different schools. The school available to take part in the program was allocated to the intervention group (n = 104), which received three 50-min body image sessions, and the other school was assigned to the control group (n = 90), which participated in usual classes. Individuals in the intervention groups took part in educational sessions about the negative consequences of poor body image, and methods on how they could be prevented. Results from pre- and post-intervention questionnaires indicated significantly more positive outcomes on self-esteem in the intervention group compared to the control group. Therefore, while educating participants on positive body image, the Happy Being Me program was also

increasing self-esteem. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965), which was also used in the current research study on Girls Rock.

Measures of self-esteem can either be global or domain specific, and the most frequently used measure in research is global self-esteem, specifically the RSES. This 10-item scale was designed to optimize ease of administration in a timely fashion. It has a brief and simple format, making it suitable, and recommended, for children (Chiu, 1988). The RSES is usually scored on a 4-point scale (strongly disagree, disagree, agree, strongly agree), generating a single score that represents total global self-esteem. The curriculum of Girls Rock includes activities, such as the "I am___Poem" (which will be described more in the "methods" chapter of the thesis) where individuals identify their positive characteristics, making the RSES an appropriate measure of self-esteem.

Although most research focuses on the effect that body image has on self-esteem, literature also shows that self-esteem affects body image. Button, Sonuga-Barke, Davies, and Thompson (1996) conducted a longitudinal study consisting of 594 girls aged 11-12 years old focusing on the role of self-esteem in predicting body image. The main finding was that 11-12 year olds with low self-esteem have a much greater risk of developing negative body image perceptions by the time they are 15-16 years of age. Those who scored the lowest on self-esteem were about eight times more likely to develop a low score on body image.

Evidently, literature indicates that body image and self-esteem are associated, and are important items to examine in young girls. Another variable that is important to take notice of in young girls is self-efficacy. Self-efficacy has been examined in the literature

along side body image and self-esteem, which are all psychological factors that relate to PA levels (Kololo, Guszkowska, Mazur, & Dzielska, 2012).

Self-Efficacy

Self-efficacy is a key component in the development of human behaviours. Self-efficacy controls an individual's thoughts, feelings, and actions (Bandura, 1986), and "refers to beliefs in one's capabilities to organize and execute the course of action required to manage prospective situations" (Bandura, 1995). In other words, self-efficacy involves an individual's belief in their ability to execute a specific action required to achieve a desired outcome (Bandura, 1986). Having a high level of self-efficacy may lead to a wide range of benefits, such as increased development and outcomes in academics, family environments, peer relationships and ability to cope with adversity, and has been shown to be low in young girls, which is why we are examining self-efficacy (Corwyn & Bradley, 2001).

There are fundamental differences between self-efficacy and body image and self-esteem. Body image perceptions and self-esteem have emotional connotations and have no reference to subsequent action (Luszczynska & Schwarzer, 2005), for example, "I feel good about my body", or "I am proud of who I am". On the other hand, self-efficacy has no emotional implications and has a prospective and operative nature (Luszczynska & Schwarzer, 2005); for example, "I am certain I will run a mile next month, even though I could not today".

Self-efficacy is the foundation of human motivation and performance accomplishments (Bandura, 2006). Highly self-efficacious individuals typically choose to perform more challenging tasks compared to less self-efficacious people (Bandura,

1997). Previous literature states that less value should be placed on the role of "talent" and innate ability (Dweck, 2000), and more value should be placed on, the more potent, role of self-regulation (Maddux, 2002). As stated by Bandura (1997), "People see the extraordinary feats of others but not the unwavering commitment and countless hours of perseverant effort that produced them" (p. 119). The higher goals that tend to be set by self-efficacious individuals are often then embarked upon with drive and persistence.

Girls on the Run (GOTR) is a highly recognized after-school program that combines running with sessions that aim to increase self-efficacy in girls in Grades 3-5. The program's mission is to "inspire girls to be joyful, healthy and confident using a fun, experience-based curriculum which creatively integrates running" (Girls on the Run, 2015). Since the establishment of GOTR in 1996 in Charlotte, North Carolina, the program now serves more than 168 000 girls in over 225 cities across the Unites States and Canada (Girls on the Run, 2015). Each session of this 12-week program consists of an introduction, a social activity that reinforces the goals of each session, and the main activity. In addition, nearing the end of the program all of the girls conduct a community service project and a running event.

Based on the number of published articles, it is evident that the GOTR organization coordinators places significance on the implementation of program evaluation. Program constructs have been examined in detail in multiple evaluations, and results have shown significant positive outcomes as a result of taking part in GOTR (Bean, Miller, Mazzeo, & Fries, 2012; DeBate & Thompson, 2005; DeBate, Pettee Gabriel, Zwald, Huberty, & Zhang, 2009; DeBate, Zhang, & Thompson, 2007; Racine, DeBate, Gabriel, & High, 2011; Rauscher, Kauer, & Wilson, 2013). The evaluations that

used pre- and post-intervention questionnaires revealed significant positive changes in outcomes, such as self-efficacy (DeBate, & Thompson, 2005; DeBate, Pettee Gabriel, Zwald, Huberty, & Zhang, 2009).

Although researchers claimed that participants' self-efficacy increased as a result of taking part in GOTR, this statement was deduced through a combination of several questionnaires. To make this claim more valid, they could have used a scale designed specifically to measure self-efficacy, such as the Schwarzer's General Self-Efficacy Scale (GSES; Jerusalem & Schwarzer, 1992). The GSES (Jerusalem & Schwarzer, 1992) is a widely used measure with concrete, international application (Luszczynska, Scholz, & Schwarzer, 2005) and it was used in the current program evaluation on Girls Rock. Self-efficacy can be understood as task/domain specific or it can be seen more broadly as general self-efficacy (GSE; Schwarzer & Jerusalem, 1995), as measured by the GSES. GSE explains self-efficacy in a broad sense and was appropriate for the current study's purpose and objectives. GSE is a universal construct, meaning it is inherent in all persons, and is generalized over many tasks/domains in which individuals make judgments of how efficacious they are. The curriculum of Girls Rock included activities where participants discussed what they did well over the week and how that made them feel. This was designed for the girls to gain confidence through small achievements, making the GSES an appropriate measure of self-efficacy.

Program Evaluation

Repeatedly programs conduct work that is not recognized by the public, other professionals in the field, or intended users (Thompson & McClintock, 2000). The issue is not in failing to produce desired results, the problem is the inability to prove through

evidence that the program is having beneficial effect (Schalock, 2001; Thompson & McClintock, 2000). Such programs can provide this evidence by including one key component: evaluation (Thompson & McClintock, 2000). Evaluation is not always utilized; this may be due to insufficient expertise, time, or funding; assumptions of the programs effectiveness and lack of a need to prove worth; or the fear of unfavourable results (Patton, 2008). Evaluation is defined as "the identification, clarification, and application of defensible criteria to determine an evaluation object's value (worth or merit) in relation to those criteria" (Fitzpatrick, Sanders, & Worthen, 2004, p. 7). In this of evaluation on Girls Rock, the "object" was the program itself, and the evaluation was designed to assess the effectiveness of producing change in FMS, body image, self-esteem, and self-efficacy in girls in Grades 4, 5 and 6.

Evaluation planning is a continuous process because evaluation gathers information, which leads to more questions, which leads to further evaluation, and so on. There is no single evaluation design that is universally the strongest (Patton, 2008), and the scope and rigor of program evaluations differ from program to program based on varying objectives, needs and circumstances (Gootman & Eccles, 2002). There are numerous types of program evaluations but they are typically divided into either process or outcome (Metz, 2007). The current evaluation was an outcome evaluation, which is "a systematic way to assess the extent to which a program has achieved its intended results" (Reisman & Clegg, 2000, p. 4). An outcome evaluation involves pre-testing the participants, implementing the program, and following up with a post-test. By comparing pre- and post-test results, outcomes associated with taking part in the Girls Rock intervention program were observed.

Conclusion

The preceding literature review began by stating the importance of increasing levels of PA in youth, especially young girls who are at increased risk of being inactive and have a steeper decline in PA levels with age. The review revealed that PA has significant positive correlations with FMS, body image, self-esteem and self-efficacy. This suggests that incorporating PA-based activities into Girls Rock may lead to more positive effects, compared to solely classroom-style sessions. Previous evaluations of programs similar to Girls Rock produced positive change in their objectives.

Once again, the purpose of the study was to evaluate the impact of the Girls Rock program on physiological and psychological components among girls in Grades 4, 5 and 6. This was the first time Girls Rock was evaluated, and results may lead to higher recruitment, and expansion of this program.

Hypotheses

H1: Taking part in Girls Rock will improve body image in girls in Grades 4, 5 and 6.

H2: Taking part in Girls Rock will improve self-esteem in girls in Grades 4, 5 and 6.

H3: Taking part in Girls Rock will improve self-efficacy in girls in Grades 4, 5 and 6.

H4: Taking part in Girls Rock will improve FMS in girls in Grades 4, 5 and 6.

Chapter 3: Methods

Participants were evaluated pre- and post-intervention to test the hypotheses of this study. This chapter provides details regarding the participants, study design, measurement tools, procedure, and data analysis.

Participants

During recruitment, there were approximately 70 members of the BGC who fit the Girls Rock inclusion criteria (i.e. girls currently in BGC and in Grades 4, 5 or 6) who were all invited to participate in the study. However, various factors created challenges in recruiting participants for this study. Many of the parents did not reply to the consent email. In addition, more parents opted their child out than anticipated, leaving 23 girls who participated in this study. In this convenience, non-probability sample, five (22%) of the girls were from Dartmouth East, eight (35%) of the girls were from Dartmouth North, four (17%) of the girls were from Humber Park, and six (26%) of the girls were from Cole Harbour BGC. There were nine (39%) girls in Grade 4, eight (35%) in Grade 5, and six (26%) in Grade 6. Although there are more BGC in Nova Scotia, these four clubs were selected because the staff communicated on a regular basis, making the implementation of the program most consistent. In addition, other BGC's were not accessible and did not offer the Girls Rock program. The decision not to include a control group was made due to the small number of participants.

Study Design

A one-group pretest-posttest quasi-experimental study design was employed to examine change in psychological (i.e. body image, self-esteem, and self-efficacy) and physiological components (i.e. FMS) following completion of the Girls Rock program.

Data were collected at two time-points: pre-intervention (March 2017), and post-intervention (May 2017). The intervention lasted eight weeks, which is a sufficient amount of time to observe change because previous studies of similar intervention programs of FMS (Morgan et al., 2013), body image (Steese, Dollette, Phillips, & Hossfeld, 2006), self-esteem (Richardson and Paxton, 2010), and self-efficacy (Bean, Miller, Mazzeo, & Fries, 2012) have documented a change in less time. Examples of Girls Rock activities, that were designed to create positive change in the program's objectives, are illustrated in Table 1.

Table 1

Examples of the Activities Conducted in Girls Rock

Theme	Activity Title	Description
Body Image	Silhouette Characters	Participants drew a silhouette of their own body and then discussed what they liked about each others drawings
Self-Esteem	"I Am___" Poem	Participants created a poem that highlighted their own positive characteristics
Self-Efficacy	Story Sharing	Participants had a discussion on what they did well over the week and how that made them feel
FMS	Dodge-ball	Participants played a standard game of dodge-ball

Measurement Tools

Participants completed a series of questionnaires that measured body image, self-esteem, and self-efficacy. Participants were also measured on their FMS using a quantified assessment. All of the measurements are summarized below.

Body image. The Body Parts Satisfaction Scale-Revised (BPSS-R; Berscheid, Walster & Bohrnstedt, 1973) was administered to quantitatively measure body satisfaction (Appendix F). The BPSS-R, a 15-item quantitative measure of body image, contains a list body parts, including: "weight", "hair", and "general muscle tone" where

participants state their degree of happiness with each of these aspects. Each item is rated on a six-point Likert scale ranging from 'extremely dissatisfied' (1) to 'extremely satisfied' (6), producing a score ranging from 15 to 90. Higher scores on the items indicate greater body satisfaction. The BPSS-R has proved to have good factorial and construct validity on undergraduate women (Petrie, Tripp, Harvey, 2002). In this two-part study, results revealed the majority of the variables to be significant (p< .001). In addition, all *t* values were significant (>1.96), which indicates the items loaded on each factor as expected. Although this measure is not validated on the current research study's population, similar programs to Girls Rock were evaluated with the BPSS-R, making it a suitable measure (Steese, Dollette, Phillips, & Hossfeld, 2006).

Self-esteem. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was administered to quantitatively measure self-esteem (Appendix G). The RSES consists of 10-items scored on a four-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (4) generating a single score that represents global self-esteem ranging from 10 to 40. Items include: "I take a positive attitude toward myself", "I feel that I am a person of worth", and "I am able to do things as well as most other people". The RSES is the most widely used scale of global self-esteem and has evidenced to have valid and reliable scores in youth, ages 12 and 13 (Furnham, Badmin, & Sneade, 2002), with alpha measures ranging from .76 to .88 (McCarthy & Hoge, 1982).

Self-efficacy. Schwarzer's General Self-Efficacy Scale (GSES; Jerusalem & Schwarzer, 1995) was administered to quantitatively measure self-efficacy (Appendix H). The GSES consists of 10-items rated on a four-point Likert scale with possible response choices of 'not at all true' (1), 'hardly true' (2), 'moderately true' (3) and 'exactly true'

(4). Sample items include: "it is easy for me to stick to my aims and accomplish my goals", and "I can handle unexpected things because I am creative". The sum of responses to all 10 items is then calculated to find a total score. The total scores range from 10 to 40, where a higher score indicates higher self-efficacy. The GSES has confirmed high construct validity (Schwarzer, Mueller, & Greenglass, 1999), and internal reliability with Cronbach's alphas between .76 and .90 (Jerusalem & Schwarzer, 1995). Although this measure was validated on university students, the most accurate way to measure the study's objectives is through a measure of *general* self-efficacy, making the GSES the best choice for this research.

Fundamental movement skills. The Test of Gross Motor Development- Second Edition (TGMD-2; Ulrich, 2000) was used to quantitatively measure FMS (Appendix 79). The TGMD-2 consists of 12 items that are divided into two sections: locomotor and object control skills. The locomotor section includes six consecutive items: running, galloping, hopping, leaping, horizontal jumping and sliding. The object control section includes six consecutive items: two-hand striking a stationary ball, stationary dribbling, catching, kicking, overhand throwing and underhand rolling. All items in both subtests are performed twice and scored as either a correct performance (1), or an incorrect performance (0) and there are no partial marks. Two trials are administered and the two scores from each participant are added together for a final *Score*. The scores for each criterion are added to get a *Skill Score*. At the end of each subtest (locomotor and object control) the six skill scores are added to get a *Subtest Raw Score*.

For this present study, the raw score was converted into the following outcomes: Gross Motor Quotient, FMS percentile, locomotor percentile, object control percentile,

locomotor age equivalent, and object control age equivalent. The Gross Motor Quotient score was chosen because it is the most useful measure obtained from the TGMD-2 (Ulrich, 2000). This numeric representation of the participant's abilities is the most reliable score because it is comprised of both subtests (locomotor and object control). Higher scores (out of 100) indicate higher proficiency in locomotor and object control skills. On the other hand, lower scores indicate lower proficiency. This score was computed by converting the raw score, to the sum of the subtest standard score, using Appendix J, and then into a quotient using Appendix K.

In addition, percentiles were used to illustrate scores, for overall FMS and it's subcategories, because percentiles are widely used by practitioners when sharing results and they allow a comparison to other percentiles (Ulrich, 2000). A percentile score shows the percentage of the distribution that is equal to or below a score. For example, a percentile of 5 indicates that 5% of the standardization sample scored equal to or below the participant's score. This score was computed by converting the raw score to the sum of the subtest standard score, using Appendix J, and the standard score into a percentile using Appendix K.

Finally, raw scores were converted into age equivalents. Age equivalents represent where the individual stands developmentally. Although the American Psychological Association (1985) has advocated the discontinuance of age equivalent scores, they are still used by many educational agencies and school systems for the TGMD-2. Age equivalents we chosen in this present research study to examine if age is related to the physical competency aspect of maturation. Specifically, I wanted to see if age equivalents were higher for older individuals, meaning older individuals would be

more physically competent. The age equivalents scores were computed by converting subtest raw scores using Appendix L.

The TGMD-2 has proven to be valid in three areas: content-description validity, criterion-prediction validity, and construct-identification validity. Additionally, this measure has test reliability in content sampling ($\alpha = .80$), time sampling ($\alpha = .88$) and interscorer differences ($\alpha = .98$; Ulrich, 2000). Although six participants in Girls Rock were one year older than the age range the TGMD-2 was developed for (i.e. 3-10 years), the TGMD-2 was chosen for the research specifically because it evaluates changes as a function of intervention, and is highly validated (Ulrich, 2000).

Procedure

Prior to conducting the research, study approval was obtained from the institutional Research Ethics Board (REB; Appendix A). Following approval, the BGC decided to include girls in Grades 4 and I subsequently gained Amendment Approval (Appendix B) to adjust for this addition. Following ethical and amendment approval, I gained permission to recruit participants and conduct the research study from the program coordinator (Appendix C), who then emailed parents/guardians (Appendix D). This email explained what the program entailed, and what was included in participating in the evaluation process. Parents/guardians were given the option to opt their child in or out of the study. No response was treated as an opt-out. If they decided to opt their child out, she was still able to take part in the Girls Rock program. Before the first program assessment I read out the Assent Oral Script (Appendix E) to those who were taking part in the study and they then provided verbal assent to me as a group. I then asked them

each individually before commencing with the physical assessment, which was followed by the questionnaires, if they agreed to take part, and everyone was.

The assessments began with conducting the TGMD-2 one-on-one, which took 7-12 minutes for each individual. After everyone finished their physical assessment, we went into a classroom where they filled out the questionnaires, which were completed in the same order both pre- and post-test. Completing the questions in the same order each time may have impacted results; for example, participants may have been tired by end of the packet and may not have put as much effort into thinking about their answers compared to the beginning. Following the structure of previous research, I verbally explained each questionnaire before they began and clarified any uncertainties participants had. It took 10 to 15 minutes to complete the questionnaires, however, the participants were given as much time as they needed. The same procedure was followed at post-test.

The eight-week curriculum was designed and controlled by the program coordinators. There were four 90-minute sessions per week, 36 sessions in total: one that concentrated on FMS, one that concentrated on body image, one that concentrated on self-esteem, and one that concentrated on self-efficacy. After the last session, participants completed the post-test questionnaire packet, which was the same as the pre-test questionnaire packet; and were assessed using the same measure of FMS. Once the packets were completed the data were compiled, coded, and entered into the Statistical Package for Social Sciences (SPSS).

Data Analysis

Body image, self-esteem and self-efficacy were analyzed the same way. Each of the variables' mean questionnaire score was calculated, and paired sample t-tests were used to compare the means of each related data from pre- and post-test (i.e. body image T1 and T2, self-esteem T1 and T2, and self-efficacy T1 and T2). By comparing the mean scores, we were able to identify any differences.

FMS was also analyzed using paired sample t-tests; however, the numbers analyzed were not raw scores, like the other measures. Raw scores were converted into a gross motor quotient; FMS, locomotor and object control percentiles; and locomotor and object control age equivalents. The quotients, percentiles and age equivalents for FMS and its subcategories were compared using paired sample t-tests. By comparing these scores from T1 and T2 we were able to identify any changes in scores after taking part in Girls Rock.

Chapter 4: Results

This chapter provides a review of the findings determining whether Girls Rock improves body image, self-esteem, self-efficacy and FMS. To start, t-tests were performed in this study that showed low p-values, which indicates powerful evidence against the null hypotheses. Because of this extreme, of low p-values from many t-tests, the paired-sample t-tests were Bonferonni corrected to decrease the chance of false positive results (Type 1 error). The Bonferonni adjusted alpha score was $\alpha = 0.017$, which was the threshold value that this research measured p-values against the variables body image, self-esteem, and self-efficacy. While the adjusted alpha value is being used, if the p-value was less than or equal to the alpha, the null hypothesis was rejected and the results were statistically significant. FMS did not use the corrected alpha value because results for this test involved quotients, percentiles and age equivalents that required their own computations. Unlike the previously mentioned variables, FMS did not show low p-values. Therefore, it was appropriate to measure the p-values for FMS results against the standard 0.05 alpha score.

Findings Related to Body Image

A paired-samples t-test was conducted to compare pre- and post-test scores of body image. There was a significant increase in scores from T1 (M=68.39, SD=15.82) to T2 (M=78.26, SD=9.30); t(22)=-3.51, p = 0.002, $\alpha = 0.017$. These results suggest that taking part in Girls Rock for eight weeks has a positive effect on body image. Specifically, our results suggest that when young girls participate in activities that reinforce positive body image, they view their body in a more positive light. Every

participant showed an increase in body image. Results of the average scores of T1 (68.30) and T2 (78.26) are illustrated in Figure 1.
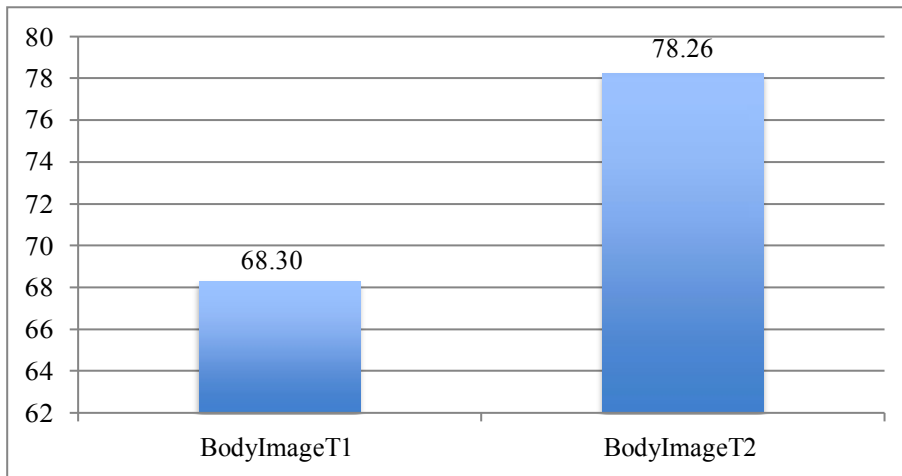
Figure 1. Bar graph showing the average pre- and post-test body image scores.

Findings Related to Self-Esteem

A paired-samples t-test was conducted to compare pre- and post-test scores of self-esteem. There was a significant increase in scores from T1 (M=34.52, SD=3.74) to T2 (M=38.17, SD=2.37); $t(22)=-6.10$, $p = 0.002$, $\alpha = 0.017$. These results suggest that taking part in Girls Rock for eight weeks has a positive effect on self-esteem. Specifically, our results suggest that when young girls participate in activities that make them feel good about themselves, their self-esteem will increase. Every participant showed an increase in self-esteem. Results of the average scores of T1 (34.52) and T2 (38.17) are illustrated in Figure 2.
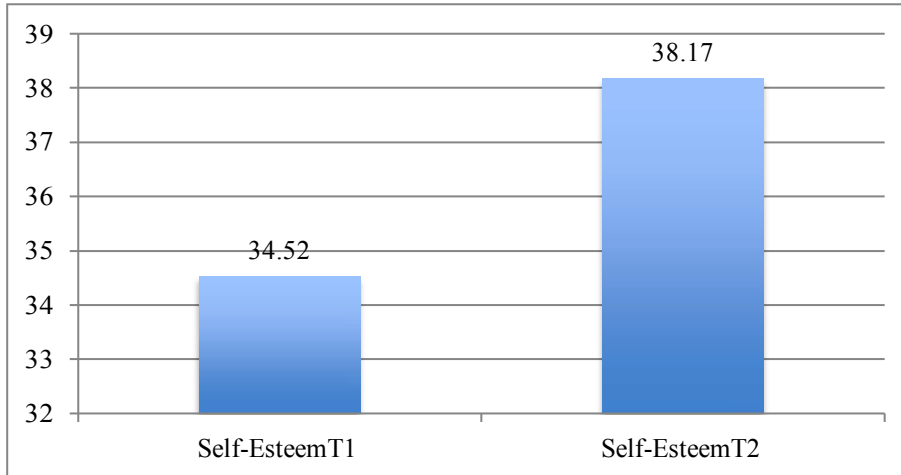
Figure 2. Bar graph showing the average pre- and post-test self-esteem scores.

Findings Related to Self-Efficacy

A paired samples t-test was conducted to compare pre- and post-test scores of self-efficacy. There was a significant increase in scores from T1 (M=31.26, SD=5.58) to T2 (M=36.48, SD=3.30); t(22)=-5.65, p<0.001, α = 0.017. These results suggest that taking part in Girls Rock for eight weeks has a positive effect on self-efficacy. Specifically, our results suggest that when young girls participate in activities that increase their confidence in their own abilities, their self-efficacy increases. Every participant showed an increase in self-efficacy. Results of the average scores of T1 (31.26) and T2 (36.48) are illustrated in Figure 3.
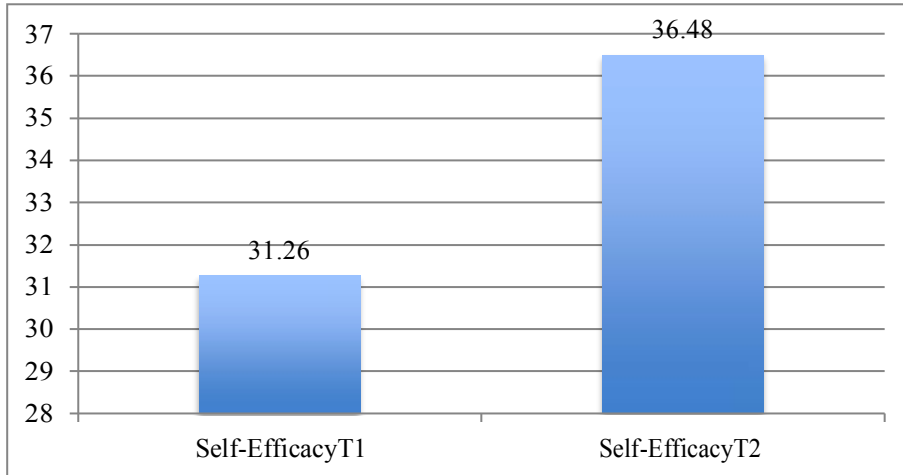
Figure 3. Bar graph showing the average pre- and post-test self-efficacy scores.

Findings Related to Fundamental Movement Skills

A paired-samples t-test was conducted to compare pre- and post-test gross motor quotients of FMS, where the largest possible score was 160. There was a significant increase in the scores from T1 (M=71.96, SD=11.21) to T2 (M=78.22, SD=119.11); $t(22)$=-2.14, $p = 0.025$, $\alpha = 0.05$. These results suggest that taking part in Girls Rock for eight weeks has a positive effect on FMS. Results of the mean quotients of FMS for T1 (71.96) and T2 (78.22) are illustrated in Figure 4.
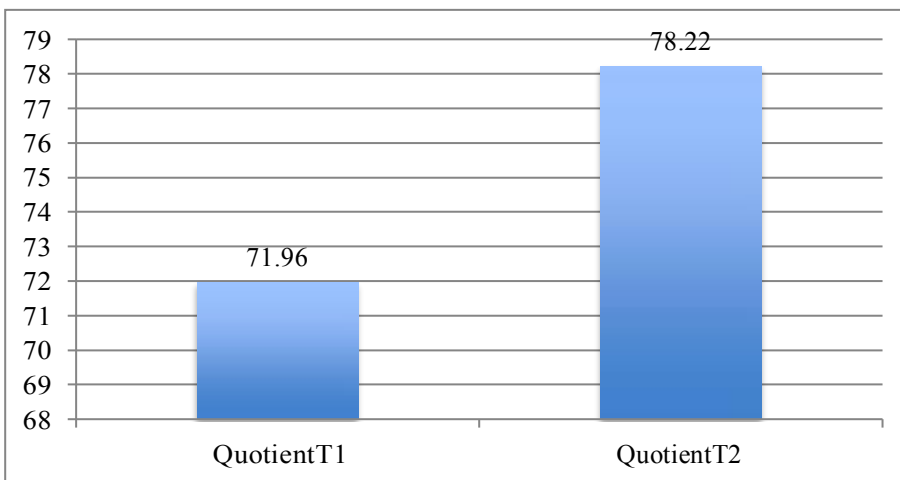
Figure 4. Bar graph showing the average pre- and post-test gross motor quotient scores.

A paired-samples t-test was conducted to compare pre- and post-test percentile scores of FMS. There was a slight increase in FMS percentile scores from T1 (M=8.17, SD=10.48) to T2 (M=10.57, SD=14.56); t(22)=-1.914, p = 0.069, α = 0.05; however, they were not statistically significant. These results suggest that taking part in Girls Rock for eight weeks may have a significant effect on FMS. The mean percentiles of FMS for T1 (8.17) and T2 (10.57) are illustrated in Figure 5.
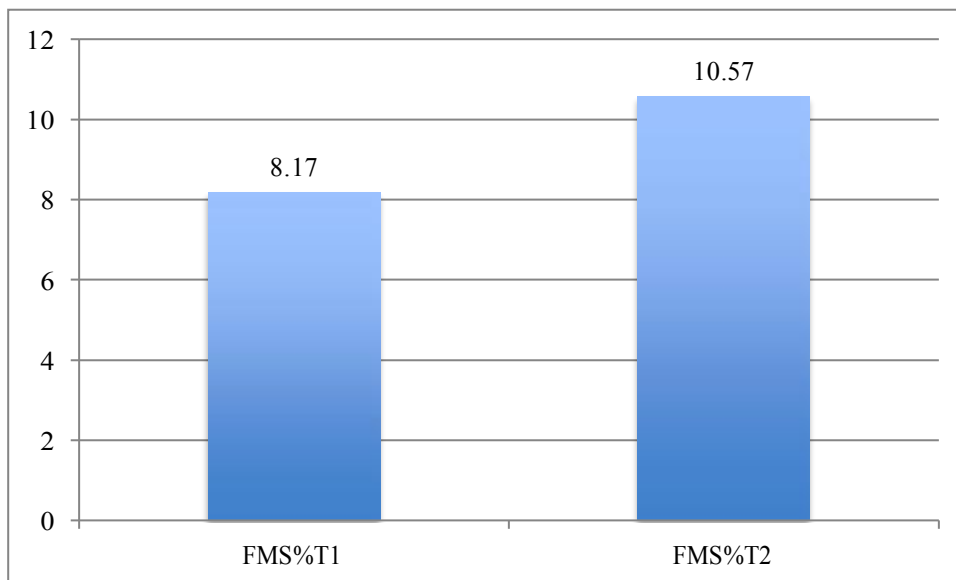
Figure 5. Bar graph showing the average pre- and post-test FMS percentile scores.

For both subcategories of FMS (locomotor and object control), participant percentiles were examined using paired-samples t-tests. Data showed no statistically significant difference in locomotor percentile scores from T1 (M=13.48, SD=12.61) to T2 (M=17.52, SD=16.59); t(22)=-1.601, p = 0.124. However, there was a significant increase in object control percentile scores from T1 (M=9.78, SD=15.27) to T2 (M=12.09, SD=16.84); t(22)=-2.78, p = 0.011. These results suggest that participation in Girls Rock may have an impact on locomotor skills, and that participation in Girls Rock does have a positive effect on object control skills. The mean locomotor percentile scores

of T1 (13.48) and T2 (17.52), and object control percentiles of T1 (9.78) and T2 (12.09) are illustrated in Figure 6.
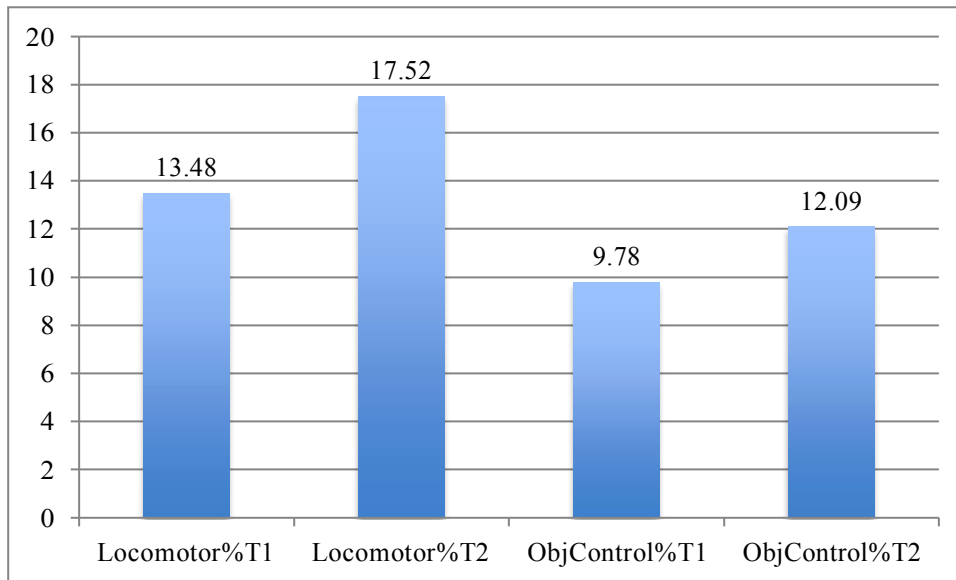
Figure 6. Bar graph showing the average pre- and post-test locomotor and object control percentile scores.

For both subcategories of FMS (locomotor and object control), participant age equivalents were examined using paired-samples t-tests. There was a significant increase in locomotor age equivalents from T1 (M=5.82, SD=1.45) to T2 (M=6.47, SD=1.66); $t(22)=-2.69$, $p = 0.013$, and object control age equivalents from T1 (M=5.56, SD=2.29) to T2 (M=6.21, SD=2.05); $t(22)=-3.630$, $p = 0.001$). This suggests that taking part in Girls Rock has a positive effect on both locomotor and object control skills. Results of the locomotor age equivalents of T1 (5.82) and T2 (6.47), and object control age equivalents of T1 (5.56) and T2 (6.21) are illustrated in Figure 7.
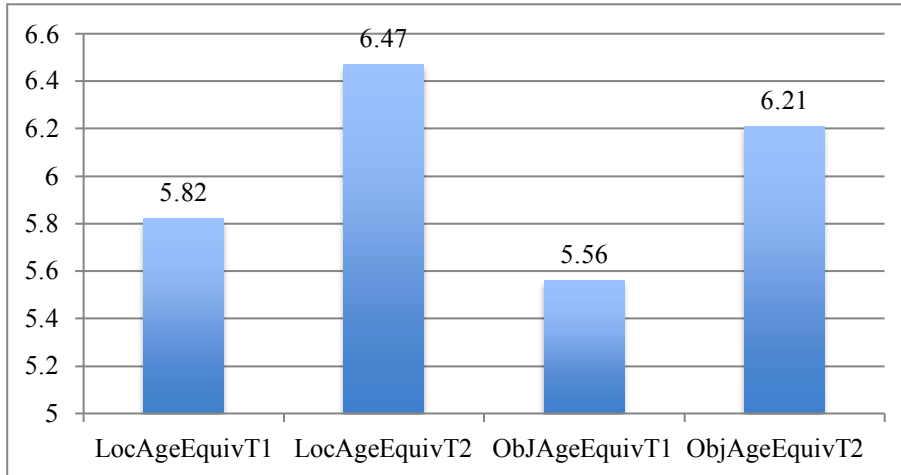
Figure 7. Bar graph showing the average pre- and post-test locomotor and object control age equivalent scores.

Although the majority of FMS scores increased for the group as a whole, there were some individuals who had equivalent or decreased scores. This means that participation in Girls Rock may not create change in all of its desired areas. These variables that showed to have no change or a negative change in some individuals were: overall gross motor quotient, FMS percentile, locomotor percentile, object control percentile, locomotor age equivalent and object control age equivalent, which is visually represented in Table 2. A blank space indicates no change, "+" represents a positive change, and "-" indicates a decrease in scores. However, there was no consistent difference or pattern in participants who had increased, decreased, or no change in scores. All of the cognitive variables (i.e. body image, self-esteem and self-efficacy) increased for each individual.

Table 2

Scores That Did Not Change or Decreased

Participant	Quotient	FMSPer	LocPer	LocAge	ObjPer	ObjAge
1	+		+	+		
2	+	+	+	+	+	+
3	-	+	+	+		-
4	+	+	+	+		-
5	-		-	-	+	+
6	-					-
7	-					+
8	+	+		+		+
9				+		+
10				+		+
11			+	+		+
12	+	+	+	+		-
13	+			+		+
14	-	+	-	-	+	+
15	+	+	+	+		+
16	+	+	+	+	+	+
17	+			+		+
18	+			+	+	+
19	-	-	-	-		-
20	+	+	+	+	+	+
21	+	+		-	+	+
22	+	+	+	+		-
23	+		+	-	+	+

Summary of Results

The results from this study include data gathered from a sample of 23 girls in Grades 4, 5 and 6 who participated in Girls Rock. Statistical analyses revealed that taking part in this eight-week program created positive change in body image, self-esteem and self-efficacy. In addition, participation in Girls Rock increased FMS. Areas of FMS that showed no improvement are overall FMS percentile and locomotor percentile; however, it was shown that gross motor quotient, object control percentile, locomotor age

equivalent and object control age equivalent skills did positively change. Pre- and post-

test scores for each variable are shown in Table 3.

Table 3

Mean, Standard Deviation and Range of the Pre- and Post-Test Conditions for Each Dependent Variable

Dependent Variable	T1			T2			Change
	Mean	SD	Range	Mean	SD	Range	Mean
Body Image	68.30	15.82	20-84	78.26	9.30	51-89	+9.96*
Self-Esteem	34.52	3.74	25-39	38.17	2.37	31-40	+3.65*
Self-Efficacy	31.26	5.58	11-38	36.48	3.30	29-40	+5.22*
Gross Motor Quotient	71.96	11.21	58-88	78.22	119.11	55-121	+6.26*
FMS Percentile	8.17	10.48	6-19	10.57	14.56	1-65	+2.39
Locomotor Percentile	13.48	12.61	1-37	17.52	16.59	1-63	+4.04
Object Control Percentile	9.78	15.27	1-63	12.09	16.84	1-63	+2.30*
Locomotor Age Equivalent	5.82	1.45	3-8.6	6.47	1.66	3.9-10.9	+0.65*
Object Control Age	5.56	2.29	1-10.9	6.21	2.05	4-10.9	+0.65*

* Statistically significant increase; Body image, score out of 90; Self-Esteem, out of 40; Self-Efficacy, out of 40; Gross Motor Quotient, out of 160

Chapter 5: Discussion

The aim of this study was to explore the effectiveness of the 8-week Girls Rock program on improving body image, self-esteem, self-efficacy, and FMS. The findings from this evaluation demonstrate that body image, self-esteem, self-efficacy and FMS improved after participation in the Girls Rock program. Much of these results are consistent with those found in the literature with similar interventions. This chapter provides discussion on the findings as they relate to the study's objectives; limitations of the study; and future directions and implications of Girls Rock.

Body Image

H1 of this research project was supported: taking part in Girls Rock improved body image in girls in Grades 4, 5 and 6. These results are consistent with previous studies, which showed that participation in intervention programs produced positive change in body image. For example, Girls Rock and Girls' Circle are similar in that both include group discussions where their peers state positive physical traits they see in each other, and both intervention programs lead to an improvement in girls' body image. Both programs used the BPSS-R as a measure of body image. Average body image scores of participants in Girls Rock increased from T1 to T2 by 9.96 points, and average scores of participants in Girls' Circle had a slightly smaller increase of 5 points (Steese, Dollette, Phillips, & Hossfeld, 2006). Girls Rock participants may have had a larger increase in body image scores because they had lower starting scores compared to Girls' Circle participants, allowing more room for improvement.

O'Dea and Abraham (2000) conducted an evaluation on another similar intervention program and also found positive results. Although their program consisted of

slightly older (11-14 years old), and male and female participants, the intervention was interactive and involved group discussions, similar to Girls Rock. This type of learning has evidence in improving learning behaviours and skill development (Hill & Hill, 1990). Results of the current study revealed that this learning style is not only effective for a co-ed program, but also a girls-only program and younger participants.

An example of an interactive, discussion-based activity in Girls Rock involved drawing silhouette characters of their bodies, which was followed by a group discussion where participants explained their drawings and commented on what they liked about each other. This facilitated discussion was an important feature of Girls Rock because it provided the opportunity for participants to hear from others. This is beneficial because, as research indicates, support from peers improves individual's perceptions, thoughts and feelings about their body (McCabe & Ricciardelli, 2003), which are the components that make up body image. These discussions were intended to increase the participants' awareness of how positive perceptions of their physical self may lead to many benefits. This awareness has been associated with "better psychological and social adjustment, lower levels of depression and anxiety, greater hope, better physical health, and better coping with adversity" (Benard, 2004, p.19).

Literature on body image, previously cited in this thesis, did not mention whether or not program staff were specifically trained to conduct body image sessions. Therefore, this present study adds to existing literature by showing that intervention programs conducted by staff with no formal body image training can be effective. Girls Rock staff had no special training related to body image, suggesting that anyone can incorporate body image activities in their programming and create positive change.

The original rationale for incorporating body image activities into Girls Rock was to increase the number of girls with high levels of body image. Results show that in this eight-week program young girls can improve their body image perceptions. The positive improvements in body image suggest there is potential value in continuing and expanding Girls Rock.

Self-Esteem

H2 of this research project was supported: taking part in Girls Rock improved self-esteem in girls in Grades 4, 5 and 6. These findings were consistent with previous research that illustrated participation in intervention programs led to positive changes in self-esteem. One of these comparable programs to Girls Rock is Happy Being Me (Richardson & Paxton, 2010). Both programs used the same interactive presentation style, rather than didactic, which is more successful in producing change (Stice & Shaw, 2004). In addition, they both emphasized the importance of expressing only positive qualities in their discussions. A specific example of this type of activity in Girls Rock was creating "I Am____Poems". This activity was designed to get the girls thinking about their good qualities, and the poems were then shared with the group and discussed. Similarly, the third session of Happy Being Me included a discussion on participants' positive qualities not relating to physical appearance. Results of the evaluation conducted on Girls Rock showed an increased average score of 3.65 points, and the increased average score from Happy Being Me was 0.92. Both studies assessed self-esteem using the Rosenberg Self-Esteem Scale, making this comparison of results more reliable. There may have been a larger increase in Girls Rock scores because it was a multi-component program with interrelated components, which, as previously mentioned, are most

effective (Pearson, Braithwaite, & Biddle, 2015); unlike Happy Being Me that focused solely on body image.

Chandler (1999) found that when someone expresses him or herself, and subsequently receives positive feedback, his or her self-esteem increases. This positive feedback was a common theme throughout Girls Rock sessions, which may have contributed to the increased self-esteem. The positive self-esteem results revealed in this study suggest that Girls Rock should continue to incorporate self-esteem sessions that encourage participant communication.

Self-Efficacy

H3 of this research project was supported: taking part in Girls Rock improved self-efficacy in girls in Grades 4, 5 and 6. Many of the Girls Rock sessions aimed to help participants believe they can achieve their goals. For example, one activity involved participants discussing something they did well over the week and how that made them feel. A study conducted by Banks-Wallace (1998) found that sharing stories "provided insights into factors that constrained their choices or enabled them to move further along their journey" (p. 21). In the current study, after an individual's story was shared, the girls drew pictures that described how they felt by hearing the story. These pictures were always happy and positive, which is consistent with Banks-Wallaces's study (1998), suggesting the activity was beneficial and should be continued in the future.

Evaluations of Girls on the Run (GOTR), a similar program to Girls Rock, claimed that self-efficacy increased as a result of taking part in the program (DeBate, & Thompson, 2005). This claim was deduced through a combination of surveys and not a self-efficacy specific survey, such as the Schwarzer's General Self-Efficacy Scale that

Girls Rock used. However, both intervention programs showed an increase in self-efficacy. GOTR grew immensely over the years and is now an international program consisting of hundreds of thousands of participants (Girls on the Run, 2015). Showing the various similarities between GOTR and Girls Rock, such as encouraging a cooperative rather than competitive environment, demonstrates the potential Girls Rock has to expand and continue to create positive change in young girls.

Fundamental Movement Skills

H4 of this research project was partially supported: taking part in Girls Rock improves FMS in girls in Grades 4, 5 and 6 when evaluated using the gross motor quotient and age equivalents, but not when using percentiles (apart from object control percentiles). These findings appear to be partially inconsistent with previous research, which conclude that participation in intervention programs produce significant improvement in FMS (Logan et al., 2012). However, FMS was not examined in the same way as in previous research. For example, many of the studies in Logan et al.'s (2012) meta-analysis used raw scores as their final TGMD-2 score; on the other hand, we converted the raw scores into quotients, percentiles and age equivalents to be more comprehensive.

For some individuals, FMS scores decreased, or did not change. These results might suggest that the program was not developmentally or instructionally appropriate (Gagen & Getchell, 2006). Girls Rock conducted the same activities and provided the same instructions for each grade. An individual's FMS competence is in part related to their growth, maturation and development; and movement proficiency has been shown to improve with age (Malina, Bouchard & Bar-Or, 2004). This suggests that the older girls

may have required more difficult activities compared to the younger girls in order to improve.

However, there was no relationship in this study between chronological age and age equivalent, suggesting that older girls may not have required more difficult activities. Before the program, all of the girls had a lower age equivalent (3-8.6) compared to their chronological age (9-11). After the program, only two girls scored the same age equivalent as their chronological age, and the rest scored lower, suggesting overall poor FMS. Additionally, change in scores was not related to age. For example, the individual who obtained the highest quotient increase of 33 (88 to 121) was 9 years-old. Additionally, the smallest increase of 3 (79 to 82) was also a 9-year-old. Furthermore, the highest (88) and lowest (58) baseline scores were from 10-year olds. This is somewhat surprising because it was expected that skill proficiency baseline scores would be higher in older participants and lower in younger participants; and that younger girls would have a greater increase in skill proficiency compared to older girls (Cowley et al., 2010).

The reason why age did not relate to participants' baseline scores could be that girls who are older might not actually be more biologically mature. This means that although ages in this study range from 9 to 11, some 9 year olds might be further along in the maturation process. However, according to Welk (1999), "while direct effects of biological factors are possible, indirect effects through the child's perception of competence are perhaps more likely" (p. 14). He also stated, "with respect to competence, evidence shows that children's perceptions (of competence) may be more important than actual ability" (p. 15).

Another factor that may have affected results is the individual's level of interest and motivation towards the TGMD-2 skills (Malina, Bouchard, & Bar-Or, 2004). It would be expected that older girls would have a better attention span than younger girls. To add, given that I was the tester, testing error may have impacted the scores because I did not have control over what the girls were doing while they were waiting their turn. Many were laughing and showing off for their friends. In the future I would have the girls who were waiting for their turn do a quiet activity so there would be no distractions to the participant, their own performance, or myself.

Limitations

Some limitations of this research include weaknesses with the sample and shortcomings in the questionnaires. The following section explains these limitations as well as potential strategies for addressing them.

Some limitations of this study are related to the sample. The use of a non-probability, convenience sample means the results cannot be generalized to other girls in Grades 4, 5 and 6 in BGC's. The BGC's were all in close proximity, creating a limitation in terms of generalizability in BGC's outside of Nova Scotia. The sample size was relatively small (n=23), compared to similar studies that found statistically significant results (Steese, Dollette, Phillips, & Hossfeld, 2006). However, this sample was all that was available because no other clubs currently implement the Girls Rock program.

The lack of availability of girls resulted in an absence of a control group, which is another limitation of the study. All of the girls in the four BGC's who were eligible to take part in Girls Rock did, so the decision was made to have a larger sample size and omit a control group. However, there could be many alternate explanations of the results,

such as extra curricular activities, sports and school. Adding a control group would allow us to see whether it is Girls Rock producing these changes, or other factors, such as physical education at school and extra curricular activities. In addition, attendance was not taken so we do not know if all 23 participants took part in all 32 sessions (8 weeks, 4x/week). This is a limitation because some participants may have participated in more sessions than others, leading to higher increases in results.

Another potential limitation is that participants came from different BGC locations. There is a possibility that the staff did not carry out all of the activities the same way, therefore the girls would have received different information with different experiences based on the needs of participants. However, staff members from all of the four clubs were in continuous communication about the program, keeping it as consistent as possible. This communication included in-person explanations of the sessions from the founder of Girls Rock, and emails when there were any questions.

Limitations related to the measurement tools were also identified within the current study. Firstly, the use of the Body Parts Satisfaction Scale- Revised as a measure of body image has only been validated on undergraduate women (Petrie, Tripp, & Harvey, 2002). To make this questionnaire more age appropriate, some of the language was changed. A pilot study of the questionnaire was conducted on four girls who were ten years of age. Some of the language used in the questionnaires was unfamiliar to them so a few words were changed to their synonyms, making the language more appropriate for the current demographic. This was done because I wanted to avoid the problem that Steese, Dollette, Phillips, and Hossfeld, (2006) encountered. They had to discard some tests because more than one answer was circled, presumably due to confusion of the

language in the questionnaires. All of the Girls Rock participants completed the surveys correctly and nothing was discarded, which may be credited to the wording changes.

Additionally, self-efficacy was measured by the General Self-Efficacy Scale, which was also validated on an older population of university students. Although this is not the population of Girls Rock, the most accurate way to measure the study's objectives is through a measure of *general* self-efficacy, making it a suitable measure (Jerusalem & Schwarzer, 1995).

Furthermore, the TGMD-2 (Ulrich, 2000) is designed to assess gross motor functioning in children aged 3 through 10 years. This is a limitation because 6 of the participants (26% of the sample) were 11, above the age range in which this measurement was validated. Notwithstanding, it would be expected that those above the age range would land in a higher percentile, but this was not the case. This could be because cues were not provided throughout the activities during the program, or skills were not rehearsed enough.

Moreover, I, as an appraiser, may have contributed to error in the scoring. It is difficult to score these skills, and I did not have someone else scoring them with me, so I could not compare my results to someone else. Additionally, I did not videotape them, which could have resulted in much more accurate scores because scores could be double checked. I would have had time to play the video, pause it, and make sure I was scoring the skills as accurately as possible. Future research could have multiple scorers and/or videotape the skills for more accurate results.

Social-desirability bias commonly affects research (King & Bruner, 2000) and may have affected this study. Social desirability may have impacted results for the self-

reported measures (i.e. body image, self-esteem and self-efficacy; CFLRI, 2013) because participants might have circled the answer they thought was a better quality to have, which might not have been how they actually felt. This could have been a particular result of the program. Participants realized the importance of the various variables from a social desirability factor. Specifically, teaching girls the importance of body image, self-esteem and self-efficacy may mean they score differently on a survey simply because they knew it is the "right thing" to choose.

A final limitation in this study is that a control group was not included. Without a control group we are unable to eliminate alternative explanations for the increase in scores. For example, some of the participants may have been involved in sports or gym class at school. Participation in these activities may have had an effect on their FMS results.

Future Directions and Implications

Because this is an outcome evaluation, discussing the actual program components is not the focal point of this thesis. An outcome evaluation involves pre-testing the participants, implementing the program, and following up with a post-test. By comparing pre- and post-test results, this type of evaluation assesses the effectiveness in producing change. On the other hand, process evaluations examine *how* the outcome was achieved by observing what was specifically done. Future research should look deeper into the program through the use of a program evaluation. A program evaluation could identify the parts of the program that worked, didn't work, and how each of those could be improved. In turn, the BGC's will need to record all of their activities so the program can

be examined in more detail. Additionally, The Girls Rock coordinator should distribute these positive results to other BGC's in an effort to expand the program to more clubs.

Body image, self-esteem and self-efficacy. It was hypothesized that Girls Rock would increase body image, self-esteem and self-efficacy scores. Because Girls Rock is a fairly small program with few resources, compared to similar intervention programs, it was somewhat surprising that the results from Girls Rock were a larger increase than others. For example, Girls Rock participants' increased body image scores were higher than results from the Girls' Circle intervention program, which is interesting because the Girls' Circle program carried out similar activities, and was two weeks longer. Future research could further examine specifics of Girls Rock to see why there may have been a larger benefit. One possible reason may be due to the fact that Girls Rock participants had lower T1 body image scores compared to Girls' Circle, leaving more room for improvement. Future research could compare the specifics of each program to see whether the starting point or the program itself led to the larger increase. In addition, there were fewer girls in Girls Rock sessions, which may have led to more opportunity for personal interactions between staff and peers. Future research could examine group size as a variable.

Similarly, Girls Rock had larger increase in self-esteem scores than Happy Being Me. Although Happy Being Me was only a three-week program, it focused exclusively on self-esteem. As previously mentioned, multi-component programs produce more positive change; this may be why Girls Rock showed greater results. However, to test whether a multi-component design is most beneficial for Girls Rock, future research could separate all four aspects of Girls Rock (i.e. body image, self-esteem, self-efficacy

and FMS). For example, focus solely on one theme for two weeks before moving on to the next, instead of interchanging themes throughout the week.

Happy Bring Me conducted a three-month follow up that showed the positive increases in self-esteem were maintained. Future research could follow up with Girls Rock to see whether the positive results are short term or long term. If positive increases of self-esteem are not maintained, further research could include weekly follow up sessions on self-esteem to see whether they help keep positive results through more repetition.

Girls Rock had a positive effect on its participants in body image, self-esteem and self-efficacy, even though staff members were not formally trained on these subjects. Future research could include trained staff to see whether staff members' knowledge might increase scores even more. Finally, revisiting the importance of session flexibility will allow for consideration of how to adapt to the needs of the specific group of girls (Pearson, Braithwaite, & Biddle, 2015), Girls Rock will need to evolve in response to the changing requirements of participants. Therefore, in the future, the program sessions should be returned to and revised. This will ensure all of the activities will be relevant and aligned with the outcomes of the program.

Fundamental movement skills. The way in which an intervention program is designed and conducted plays a large role in its effectiveness (Logan et al, 2012). Therefore, based on previous literature, a possible reason for lack of improvement in a couple of FMS measures might be insufficient instruction. FMS competency is not acquired 'naturally' over time (Clark 2005); skills need to be learned, practiced and reinforced (Goodway & Branta 2003).

It would be beneficial if Girls Rock staff could teach proper technique of the necessary skills because Logan et al. (2012) stated that many programs that produced positive change in FMS had one similar characteristic: staff provided proper instruction during the FMS activities. Future research could change Girls Rock sessions so that before each activity the girls practice the skills with proper technique while staff members teach proper form. This allotted practice time would contribute to the necessary repetition needed for FMS competence, which may have been lacking in this program. Future research should also ensure staff members reinforce the skills throughout the session and program. For example, when an individual uses proper running form a staff member could point that out, or if she uses improper running form, they could provide a cue to help with technique. In the current study, Girls Rock moved from one activity to the next, without returning to previous skills to reinforce them. In the future these skills could then be used again in future sessions. If Girls Rock includes more learning, practicing and reinforcing, there may be more significant results.

Another explanation on why there were inconsistent FMS results with other studies could be that proper FMS techniques were not taught to participants. A reason why the proper technique may not have been taught to participants could be that the staff members were not trained in FMS. In the future Girls Rock should have staff member trained in FMS because, like other studies, it may increase program effectiveness (Gallahue, Ozmun, & Goodway, 2012). Girls Rock staff members could learn different methods to develop FMS in youth, similar to staff members of other programs, through Developing Fundamental Movement Skills manuals (Mitchell, McLennan, Latimer, Graham, Gilmore, & Rush, 2013). Through education, Girls Rock staff members could

teach proper technique of the necessary skills. Future research could examine whether staff competency in FMS affects Girls Rock outcomes.

An additional reason why there may have been no significant changes, or decreases in scores could be that the program was not long enough and the girls did not have enough time allotted to FMS to develop these skills. Foweather and colleagues (2008) found consistently positive results in FMS in an after-school activity-based program, but this intervention was nine weeks long and focused on FMS for 1080 minutes. However, Girls Rock emphasized FMS for only 720 minutes, via activities, in eight weeks. Future research could extend Girls Rock for a few more weeks to see if FMS results would change in all aspects, for all individuals.

Maturation could have also impacted FMS competency. A girl in Grade 4 is often very different, in terms of maturation, compared to a girl in Grade 6, and it might not be appropriate to lump all girls of different ages together. Gagen and Getchell (2006) suggest that FMS intervention programs be developmentally and instructionally appropriate. Girls Rock conducted the same activities and provided the same instruction for all ages; however, those who are further along in the maturation process may have required something different to see greater results. Future research could assess maturation, not simply chronological age, and determine whether or not it influences the effectiveness of Girls Rock.

Age did not seem to have an effect on participants' baseline scores. It could be that participants' perceptions of their ability play a larger role in their competency than their actual ability. This suggests that although age may influence FMS scores, it is more

likely that their confidence in their ability plays a bigger role. Future research could examine whether or not age and/or perceptions influence ability (FMS scores).

Finally, the average FMS age is around 5 and 6 for girls that are 9-11 years old. Most of the girls were well below the competency they should be at. These low number may be due to lack of participation in extra-curricular, organized activities. Nevertheless, these results illustrate the need for interventions to be put into place with the focus on increasing FMS.

Conclusion

This is the first study conducted on Girls Rock and it is important because it provides evidence for its effectiveness in achieving desired outcomes. Findings of this study reinforce the statement that Girls Rock has a positive impact on body image, self-esteem and self-efficacy, and Girls Rock has a partially positive impact on FMS. This information can be used to attain the future goals of recruiting more participants, retaining those already involved, and expanding to other BGC's. There are 650 BGC locations across Canada, which provide programs and services (BGC About Us). This demonstrates the potential to be scaled up across the country.

Girls Rock, and intervention programs alike, are critical because they provides young girls the education required to increase key variables in their lives, which may carry on until adulthood. Furthermore, it is important that Girls Rock continues to be evaluated to ensure the program's objectives are being met, and to discover ways to improve Girls Rock. In sum, Girls Rock had a positive impact on its participants and we recommended that all young girls take part in a program like this.

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Appendices

Appendix A

Research Ethics Board Letter of Approval

**DALHOUSIE
UNIVERSITY**
Research Services

**Health Sciences Research Ethics Board
Letter of Approval**

January 11, 2017

Jenna Shaddock
Health Professions\Health & Human Performance

Dear Jenna,

REB #:   2016-3923
Project Title: Evaluation of Girls Rock: An Intervention Program for Girls in Grades
5 and 6

Effective Date: January 11, 2017
Expiry Date: January 11, 2018

The Health Sciences Research Ethics Board has reviewed your application for research
involving humans and found the proposed research to be in accordance with the Tri-
Council Policy Statement on *Ethical Conduct for Research Involving Humans.* This
approval will be in effect for 12 months as indicated above. This approval is subject to
the conditions listed below which constitute your on-going responsibilities with respect to
the ethical conduct of this research.

Sincerely

Research Ethics Board Amendment Approval

Health Sciences Research Ethics Board
Amendment Approval

March 08, 2017

Jenna Shaddock
Health Professions\Health & Human Performance

Dear Jenna,

REB#:   2016-3923
Project Title: Evaluation of Girls Rock: An Intervention Program for Girls in Grades 5 and 6

The Health Sciences Research Ethics Board has reviewed your amendment request and has approved this amendment request effective today, March 08, 2017.

Sincerely

Appendix C

Permission to Recruit Participants and Conduct Research Study

Alana Doucette

Director of Programs

Boys and Girls Clubs of Greater Halifax

October February 14, 2017

To Whom It May Concern:

This letter is to confirm that permission has been granted to Jenna Shaddock to recruit participants and conduct the research study, Evaluation of Girls Rock: A Program for Girls in Grades 4, 5 and 6 at our Girls and Boys Club.

Sincerely

Appendix D

Email to Parents/Guardians

Hello,

Thank you for your interest in enrolling your child in the Girls Rock Program. In addition to the Girls Rock program, Jenna Shaddock, a Master's student at Dalhousie University, will be conducting a research project. The purpose of this research project is to find out if the program is reaching its goals of improving girls' self-esteem, body image, self-efficacy and physical activity. Choosing whether or not to take part in this research is entirely optional. If you are willing to opt your child into this study please send and email to Jenna Shaddock (jennashaddock@dal.ca) saying "opt in", if you do not want your child participating in this study please say "opt out". If you decide to opt out your daughter out there will be no impact on your participation in the rest of the Girls Rock program. There is an attachment to this email providing more detail about what is involved in the research. You should discuss any questions you have about this study with Jenna Shaddock (jennashaddock@dal.ca). Please ask as many questions as you like.

Sincerely,

Alana Doucette

Attachment:

Consent Form:

The information below tells you about what is involved in the research, what your daughter will be asked to do and about any benefit, risk, inconvenience or discomfort that your daughter might experience. You should discuss any questions you have about this study with Jenna Shaddock, who will be conducting the research as part of her master's program, or her supervisor, Lori Dithurbide. Please ask as many questions as you like.

Purpose and Outline of the Research Study

The research study will be evaluating Girls Rock on its effectiveness to improve physical and psychological factors in girls in Grades 4-6. The objectives of the program are to increase physical activity, and body image. Data will be collected before and after the eight-week program through questionnaires and observations, and results will be compared to see if any changes happened. Results will tell us whether participation in the Girls Rock program has a positive effect on girls in Grades 4, 5 and 6.

Who Can Take Part in the Research Study

To participate in the study, participants should be female, including trans or non-gender conforming girls, being in Grades 4-6 and currently participating in the Girls Rock program. An individual must participate in at least 5 sessions on each topic like body image, self-esteem, self-efficacy and physical activity to be considered a participant in the study.

What Participants Will Be Asked to Do

To help us understand the if this program is effective, before the first session participants will be asked to complete a packet of questionnaires. Questions will be asked about body image, self-esteem, and self-efficacy. For example, participants will be asked to rate on a scale ranging from 'strongly agree' (1) to 'strongly disagree' (4) on items such as "I take a positive attitude toward myself". In addition, participants will be observed on 12 physical activity movements that will each be performed twice. For example, participants will be asked to catch a ball, two times, and will be scored a 0 or 1. At the end of the Girls Rock program participants will answer the same questions and will perform the same skills. Results from before and after the program will be compared to see if there are any changes. This study will take about 1 hour at the beginning of the Girls Rock Program, and 1 hour at the end of the Girls Rock Program, for a total of 2 hours taking part in this study.

Possible Benefits, Risks and Discomforts

There may be benefits of participating in this study, such as increased self-awareness by answering questions participants may not have thought of before, however, it is still unknown. If this is not the case, participation in this study may not have any benefits, but we may learn things that will benefit participants and others in the future.

The risks from participating in this study are minimal. There may be the possibility of emotional or psychological distress caused by answering personal questions, or being bored or tired. However, participants will be given breaks between activities to lower these risks.

Although the risk is small there is always a risk of injury when assessing physical motor skills.

How information will be protected

All of the results throughout the study will be kept private. Only the Jenna Shaddock, and her supervisor, Lori Dithurbide, will have access to this information. We will describe and share our findings in an oral thesis defense presentation and a written thesis report. Participants will not be identified in any way in our reports or presentations. The people who work with the information have special training and have an obligation to keep all research information private. All electronic records will be kept secure in a password-protected. During the data collection process the participant's name will be used. After the final data are collected participants will be deidentified using randomized number codes. Once all of the data has been analyzed, the number code key will be destroyed. Although all of the results and information will be kept completely confidential, there is a strong possibility that other people will be aware of who is participating in the study. The data collection process will take place in classroom or gym space and in most cases with other members of the program and staff will be there. However, it is not possible to ensure participant's privacy when assessing tasks in the gym.

If Participants Decide to Drop Out

Participants are free to leave the study at any time. If one decides to stop participating at any point during the study, they can also decide whether they want any of the information to be removed or if they will allow us to use that information. If participants would like your data removed from the study they are able to do so anytime before the data analysis process is finished. Once the researcher has finished the data analysis data will not be removed. If participants decide to opt out they may still take part in the Girls Rock program. If they decide to stop participating in the research and want to withdraw from

the study they will be brought to another group who is not part of the research to participate in that activity. In the other groups they will be participating in typical BGC activities like crafts, science, or sporting games. While every effort will be made to not identify the reason for joining the group, we cannot guarantee that the fact that the participant has withdrawn from the study will be kept confidential, due to group dynamics. The Girls Rock program coordinator will not be aware of who has chosen to participate in the study.

How to Obtain Results

We will provide you with a short description of group results when the study is finished. Participants are also welcome to email Jenna Shaddock to obtain group results. No individual results will be provided.

Questions

Again, your daughter is invited to participate, however, whether or not she agrees to participate will not affect her ability to participate in the Girls Rock program. We are happy to talk with you about any questions or concerns you may have about participation in this research study. Please contact Jenna Shaddock (jennashaddock@dal.ca), or Lori Dithurbide (lori.dithurbide@dal.ca) at any time with questions, comments, or concerns about the research study. We will also tell you if any new information comes up that could effect the decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact Catherine Connors, Director, Research Ethics, Dalhousie University at (902) 494-

1462, or email: ethics@dal.ca, or any other questions can be answered by the supervisor

of this research project, Lori Dithurbide by email: lori.dithurbide@dal.ca.

Appendix E Assent

Oral Script

Evaluation of Girls Rock: A Program for Girls in Grades 4-6

This study is being done to find out if girls in Grades 4-6 benefit from taking part in Girls Rock. This process is going to happen twice, so everything you do today you will do again in 8 weeks when the program is finished.

You will be asked to answer questions on a questionnaire, and take part in some physical activities. It will take about one hour to complete everything. Taking part in this study is voluntary. You don't have to answer all questions. You may stop at anytime and will be taken to participate in an activity in another group for today.

Lots of girls who answer these questions find them fun, but sometimes they find them a bit boring, but that's ok, just go at your own speed.

Answers to these questions will be kept private, so nobody will know what you said. I will now hand out the questionnaires. As I am doing this, I will ask each of you individually if you wish to participate. If not, that is okay.

Appendix F

Body Parts Satisfaction Scale-Revised

My Body

DIRECTIONS: Below is a list of body parts. Please rate how much you like each body

part by circling a number.

1 = I do not like at all ☹   6 = I like a lot ☺

Height	1	2	3	4	5	6
Weight	1	2	3	4	5	6
Hair	1	2	3	4	5	6
Skin	1	2	3	4	5	6
Face	1	2	3	4	5	6
Shoulders	1	2	3	4	5	6
Arms	1	2	3	4	5	6
Stomach	1	2	3	4	5	6
Chest	1	2	3	4	5	6
Back	1	2	3	4	5	6
Buttocks	1	2	3	4	5	6
Legs	1	2	3	4	5	6
Lower legs (below knee)	1	2	3	4	5	6
Muscle	1	2	3	4	5	6
Overall body size and shape	1	2	3	4	5	6

Rosenberg Self-Esteem Scale

How I Feel About Myself

DIRECTIONS: Please answer the questions by circling a number.

1 = Not true at all ☹   4 = Very true ☺

I am happy with who I am	1	2	3	4
I think that I am a good person	1	2	3	4
I feel that a lot of things about me are good	1	2	3	4
I am able to do things as well as most other people	1	2	3	4
I feel that I have a lot to be proud of	1	2	3	4
I am a helpful person	1	2	3	4
I feel that I am important	1	2	3	4
I have a lot of respect for myself	1	2	3	4
I think that I am a success	1	2	3	4
I have a positive attitude of who I am	1	2	3	4

Schwarzer's General Self-Efficacy Scale

My Confidence
DIRECTIONS: Please answer the questions by circling a number.

1 = Not at all true ☹   4 = Very true ☺

I can always solve difficult problems if I try hard enough

1   2   3   4

If someone disagrees with me, I can do things to get what I want

1   2   3   4

It is easy for me to stick to my aims and accomplish my goals

1   2   3   4

If I didn't expect something to happen I am confident that I could still deal with it

1   2   3   4

I can handle unexpected things because I am creative

1   2   3   4

I can solve most problems if I work hard enough

1   2   3   4

I can stay calm when I am in hard situations

1   2   3   4

When there is a problem, I can usually find many solutions

1   2   3   4

If I am in trouble, I can usually think of a solution

1   2   3   4

I can usually handle whatever comes my way

1   2   3   4

Appendix I

TGMD-2 Profile/Examiner Record Form

Preferred Hand: Right ☐ Left ☐ Not Established ☐
Preferred Foot: Right ☐ Left ☐ Not Established ☐

Locomotor Subtest

Skill	Materials	Directions	Performance Criteria	Trial 1	Trial 2	Score
1. Run	60 feet of clear space, and two cones	Place two cones 50 feet apart. Make sure there is at least 8 to 10 feet of space beyond the second cone for a safe stopping distance. Tell the child to run as fast as he or she can from one cone to the other when you say "Go." Repeat a second trial.	1. Arms move in opposition to legs, elbows bent			
			2. Brief period where both feet are off the ground			
			3. Narrow foot placement landing on heel or toe (i.e., not flat footed)			
			4. Nonsupport leg bent approximately 90 degrees (i.e., close to buttocks)			
					Skill Score	
2. Gallop	25 feet of clear space, and tape or two cones	Mark off a distance of 25 feet with two cones or tape. Tell the child to gallop from one cone to the other. Repeat a second trial by galloping back to the original cone.	1. Arms bent and lifted to waist level at takeoff			
			2. A step forward with the lead foot followed by a step with the trailing foot to a position adjacent to or behind the lead foot			
			3. Brief period when both feet are off the floor			
			4. Maintains a rhythmic pattern for four consecutive gallops			
					Skill Score	
3. Hop	A minimum of 15 feet of clear space	Tell the child to hop three times on his or her preferred foot (established before testing) and then three times on the other foot. Repeat a second trial.	1. Nonsupport leg swings forward in pendular fashion to produce force			
			2. Foot of nonsupport leg remains behind body			
			3. Arms flexed and swing forward to produce force			
			4. Takes off and lands three consecutive times on preferred foot			
			5. Takes off and lands three consecutive times on nonpreferred foot			
					Skill Score	
4. Leap	A minimum of 20 feet of clear space, a beanbag, and tape	Place a beanbag on the floor. Attach a piece of tape on the floor so it is parallel to and 10 feet away from the beanbag. Have the child stand on the tape and run up and leap over the beanbag. Repeat a second trial.	1. Take off on one foot and land on the opposite foot			
			2. A period where both feet are off the ground longer than running			
			3. Forward reach with the arm opposite the lead foot			
					Skill Score	

Skill	Materials	Directions	Performance Criteria	Trial 1	Trial 2	Score
5. Horizontal Jump	A minimum of 10 feet of clear space and tape	Mark off a starting line on the floor. Have the child start behind the line. Tell the child to jump as far as he or she can. Repeat a second trial.	1. Preparatory movement includes flexion of both knees with arms extended behind body			
			2. Arms extend forcefully forward and upward reaching full extension above the head			
			3. Take off and land on both feet simultaneously			
			4. Arms are thrust downward during landing			
					Skill Score	
6. Slide	A minimum of 25 feet of clear space, a straight line, and two cones	Place the cones 25 feet apart on top of a line on the floor. Tell the child to slide from one cone to the other and back. Repeat a second trial.	1. Body turned sideways so shoulders are aligned with the line on the floor			
			2. A step sideways with lead foot followed by a slide of the trailing foot to a point next to the lead foot			
			3. A minimum of four continuous step-slide cycles to the right			
			4. A minimum of four continuous step-slide cycles to the left			
					Skill Score	
			Locomotor Subtest Raw Score (sum of the 6 skill scores)			

Object Control Subtest

Skill	Materials	Directions	Performance Criteria	Trial 1	Trial 2	Score
1. Striking a Stationary Ball	A 4-inch lightweight ball, a plastic bat, and a batting tee	Place the ball on the batting tee at the child's belt level. Tell the child to hit the ball hard. Repeat a second trial.	1. Dominant hand grips bat above nondominant hand			
			2. Nonpreferred side of body faces the imaginary tosser with feet parallel			
			3. Hip and shoulder rotation during swing			
			4. Transfers body weight to front foot			
			5. Bat contacts ball			
					Skill Score	
2. Stationary Dribble	An 8- to 10-inch playground ball for children ages 3 to 5; a basketball for children ages 6 to 10; and a flat, hard surface	Tell the child to dribble the ball four times without moving his or her feet, using one hand, and then stop by catching the ball. Repeat a second trial.	1. Contacts ball with one hand at about belt level			
			2. Pushes ball with fingertips (not a slap)			
			3. Ball contacts surface in front of or to the outside of foot on the preferred side			
			4. Maintains control of ball for four consecutive bounces without having to move the feet to retrieve it			
					Skill Score	

Converting Subtest Raw Scores to Standard Scores

TABLE B.3
Converting Subtest Raw Scores to Percentiles and Standard Scores
Object Control Subtest
Male

| %iles | Age | | | | | | | | | | | | Std. Scores |
	3-0 through 3-5	3-6 through 3-11	4-0 through 4-5	4-6 through 4-11	5-0 through 5-5	5-6 through 5-11	6-0 through 6-5	6-6 through 6-11	7-0 through 7-5	7-6 through 7-11	8-0 through 8-11	9-0 through 10-11	
<1	•	•	•	•	1-6	1-8	1-11	1-14	1-17	1-19	1-22	1-26	1
<1	•	•	•	1-6	7-8	9-11	12-14	15-17	18-19	20-22	23-26	27-29	2
1	•	•	1-6	7-8	9-11	12-14	15-17	18-19	20-22	23-26	27-29	30-32	3
2	•	1-6	7-8	9-11	12-14	15-17	18-19	20-22	23-26	27-29	30-32	33-34	4
5	1-6	7-8	9-11	12-14	15-17	18-19	20-22	23-26	27-29	30-32	33-34	35-37	5
9	7-8	9-11	12-14	15-17	18-19	20-22	23-26	27-29	30-32	33-34	35-37	38-39	6
16	9-11	12-14	15-17	18-19	20-22	23-26	27-29	30-32	33-35	35-37	38-40	40-41	7
25	12-14	15-17	18-19	20-22	23-26	27-29	30-32	33-35	36-38	38-40	41	42	8
37	15-18	18-19	20-22	23-26	27-29	30-32	33-35	36-38	39-40	41	42	43	9
50	19-20	20-23	23-26	27-29	30-32	33-35	36-38	39-41	41-42	42-43	43-44	44-45	10
63	21-23	24-26	27-29	30-32	33-35	36-38	39-41	42-43	43-44	44-45	45-46	46	11
75	24-26	27-29	30-32	33-35	36-38	39-41	42-43	44-45	45-46	46	47	47	12
84	27-29	30-32	33-35	36-38	39-41	42-43	44-45	46	47	47	48	48	13
91	30-32	33-35	36-38	39-41	42-43	44-45	46	47	48	48	•	•	14
95	33-35	36-38	39-41	42-43	44-45	46	47	48	•	•	•	•	15
98	36-38	39-41	42-43	44-45	46	47	48	•	•	•	•	•	16
99	39-41	42-43	44-45	46	47	48	•	•	•	•	•	•	17
>99	42-43	44-45	46	47	48	•	•	•	•	•	•	•	18
>99	44-45	46	47	48	•	•	•	•	•	•	•	•	19
>99	46-48	47-48	48	•	•	•	•	•	•	•	•	•	20

Appendix K

Converting Sums of Subtest Standard Scores to Percentiles and Quotients

TABLE C.1
Converting Sums of Subtest Standard Scores to Percentiles and Quotients

Percentile Rank	Sum of Subtest Standard Scores	Quotient
>99	40	160
>99	39	157
>99	38	154
>99	37	151
>99	36	148
>99	35	145
>99	34	142
>99	33	139
>99	32	136
99	31	133
98	30	130
97	29	127
95	28	124
92	27	121
89	26	118
84	25	115
79	24	112
73	23	109
65	22	106
58	21	103
50	20	100
42	19	97
35	18	94
27	17	91
21	16	88
16	15	85
12	14	82
8	13	79
5	12	76
3	11	73
2	10	70
1	9	67
<1	8	64
<1	7	61
<1	6	58
<1	5	55
<1	4	52
<1	3	49
<1	2	46

Appendix L

Converting Subtest Raw Score to Age Equivalents

TABLE D.1
Converting Subtest Raw Scores to Age Equivalents

Age Equivalent	Locomotor Female and Male	Object Control Female	Object Control Male	Age Equivalent
<3-0	<19	<15	<19	<3-0
3-0	19	15	19	3-0
3-3	20-21	16	20	3-3
3-6	22	17	21	3-6
3-9	23-24	18-19	22	3-9
4-0	25	20	23	4-0
4-3	26-27	21-22	24-25	4-3
4-6	28	23	26	4-6
4-9	29	24	27-28	4-9
5-0	30-31	25	29	5-0
5-3	32	26	30-31	5-3
5-6	33-34	27	32	5-6
5-9	35	28-29	33-34	5-9
6-0	36-37	30	35	6-0
6-3	38	31	36-37	6-3
6-6	39	32	38	6-6
6-9	40	33	39	6-9
7-0	—	34	40	7-0
7-3	41	35	41	7-3
7-6	—	36	—	7-6
7-9	—	37	42	7-9
8-0	42	38	—	8-0
8-3	—	39	—	8-3
8-6	43	—	43	8-6
8-9	—	40	—	8-9
9-0	—	—	—	9-0
9-3	—	—	44	9-3
9-6	—	41	—	9-6
9-9	—	—	—	9-9
10-0	44	—	—	10-0
10-3	—	—	—	10-3
10-6	—	42	45	10-6
10-9	—	—	—	10-9
>10-9	>44	>42	>45	>10-9