Exploring the Relationship between Physical Activity Intensity and Body Appreciation in Adolescent Girls

by © Laura O'Keefe

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Abstract

As a result of the COVID-19 pandemic, physical activity (PA) levels have sharply declined among youth. This comes at a time when PA engagement is already low, but it has been reported that less than one in five children and youth currently meet the Canadian movement guidelines. This is concerning given the mental and physical health benefits associated with PA participation, which include improved cardiorespiratory fitness, muscular strength/endurance, cognitive functioning, and psychosocial health. It is important to continue to examine the factors that contribute to engagement in and disengagement from PA. Among girls, one prominent factor contributing to disengagement from PA is body image, which generally happens during the transition to adolescence. To date, most research focuses on interventions aimed at improving negative body image in PA and sport. However, these interventions neglect the importance of cultivating a positive body image among individuals. More research is needed to understand the relationship of PA intensity in helping adolescent girls cultivate a positive body image. This research examines the relationship between PA participation and body appreciation and the role that exercise intensity plays in helping adolescent girls cultivate body appreciation. Participants included girls aged 13 to 17 years attending school in Newfoundland and Labrador. In this mixed-methods study, physical activity was measured using accelerometry and body appreciation was assessed using the Body Appreciation Scale (BAS-2). Semi-structured interviews were also conducted to examine the influence of physical activity participation on body appreciation in girls. Descriptive statistics were computed for both the BAS-2 as well as average minutes of physical activity per day. Correlational analyses were used to examine

relationships between physical activity and body appreciation. A thematic analysis was conducted to analyze the interview data. Although no significant relationship was established for physical activity participation and body appreciation in adolescent girls, the qualitative results from the interviews suggest that participating in moderate to vigorous physical activity intensity in addition to light physical activity promotes a more positive perception of one's body image.

Chapter 1 - Introduction

In Canada, only 28 % of Canadian children and youth are adhering to the Canadian 24-Hour Movement Guidelines, which suggests children and youth should participate in at least 60 minutes of moderate-to-vigorous physical activity (MVPA) per day (ParticipACTION, 2022). Specifically, data from cross sectional studies have revealed that adolescent participation in physical activity (PA) peaks from ages 10-14, followed by a significant decline from ages 15-19 and onwards (Westerbeek & Eime, 2021). The decline in PA levels during adolescence may be understood from a developmental perspective as numerous social and biological factors contribute to this decline. With social factors, parents and peers act as key socialization agents and thus play a pivotal role in determining the likelihood that adolescents will participate in less PA (Lawler et al., 2021; Lau et al., 2019). Biological factors, such as the onset of puberty (Baker et al., 2007; Finne et al., 2011) and the rapid development of the adolescent brain (Herting & Chu, 2017) may also contribute to PA dropout among adolescents. The steep decline in PA levels during adolescence is concerning given that participation in physical activity has been associated with numerous social, mental and physical health benefits for both adolescent girls and boys, namely, enhanced cardio metabolic functioning, cognitive functioning, psychosocial skills, improved self-esteem and mental well-being (Cowley et al., 2021). In order to help combat this issue, previous researchers have identified several additional factors that may contribute to the decline in physical activity levels during adolescence (Cowley et al., 2021; Duffey et al., 2021; Lawler et al., 2021). These factors include but are not limited to physical self-perception, peer involvement in PA (Lawler et al., 2021), the type of and timing of physical activity, media attention, and opportunities to participate in PA (Cowley et al., 2021).

The drop in PA levels during adolescence is particularly pronounced among girls (Cowley et al., 2021: Lawler et al., 2021; Owen et al., 2018; Wallace et al., 2019). Furthermore, research by Canadian Women and Sport indicates that only 42 % of adolescent girls participate in sport compared to 59% of adolescent boys (ParticipACTION, 2022). In adolescent girls sport competence, defined by Estevan and Barnett, (2018) as one's ability to perform a wide variety of motor skills, such as movement coordination and control was identified as a major barrier to physical activity participation. Other factors not limited to support from family, teachers and peers (Lawler et al., 2021; Pluta et al., 2020) and access to facilities to participate in physical activity (Dowda et al., 2009; Pulling et al., 2021) were also identified as major barriers to participation in physical activity. A recent systematic review conducted by Foley and colleagues (2021) suggested that body image was one of the most prominent factors inhibiting the engagement of adolescent girls in physical activity. For example, Foley et al. (2021) revealed that body image, teasing and gender identification were strong determinants of physical activity participation in adolescent girls. Additionally, Koulanova et al. (2021) revealed that adolescent girls reported experiences of their appearance being compared or evaluated by others more frequently than boys in physical activity settings and thus more likely to drop out of sports and physical activities.

Similarly, PA participation can have a negative influence on the body image of adolescent girls. This may be grounded in the immense amount of pressure that society places on girls to conform to specific physique and fitness ideals which is often amplified in highly competitive and evaluative sport and physical activity environments (Pila et al., 2020). Additionally, the prevalence of weight stigma (i.e., negative attitudes, and beliefs concerning weight) and weight-related shame (i.e., a distressing emotion that causes individuals to diminish

themselves based on their weight, size, or shape) in PA contexts may prompt girls to disengage/drop out of PA and sport during adolescence (Pila et al., 2020). These factors and other influences may impact the body image of girls causing them to drop out of sport and disengage from physical activity as they transition to and throughout adolescence. To date, most research has focused on negative body image, which is concerning because these intervention studies neglect the importance of cultivating a positive body image among individuals. One of the most prominent reasons this can be problematic is because positive body image has been suggested to improve the efficacy and longevity of therapeutic gains among both global and eating disorder populations (Pila et al., 2020). Additionally, it is still unclear whether participation in specific types or intensities of physical activity may be more effective than others in helping adolescent girls cultivate a positive body image.

Therefore, the purpose of this research study was to explore the impact that participation in physical activity has on the body image of adolescent girls. Specifically, this research examined 1) the relationship between physical activity participation and body image among adolescent girls; and 2) whether participation in specific types or intensities of PA are more effective than others in helping girls cultivate a positive body image.

Chapter 2 - Literature Review

Body image has received a considerable amount of attention due to its negative association with PA and sport participation for adolescent girls (Foley et al., 2021; Pila et al., 2020). It is important to note, that a few different definitions of body image exist in the literature; for example, Robbins et al. (2017) defines body image broadly as “one’s self-evaluation of their outer appearance.” Gil-Llario et al., (2019) provides a more in-depth definition of body image, defined as a dynamic and multidimensional construct that develops over time and is comprised

of three inter-related components, namely, cognition, perception and behavior. Specifically, the affective component refers to the emotions that one has regarding their body which may influence their level of satisfaction or dissatisfaction with their body. The behavioral component refers to the tasks that one regularly engages in to conceal, modify or reveal their body and the cognitive component pertains to one's mental representation of their body. Lastly, the perceptual component refers to how one perceives their body with respect to its actual appearance (Tewari et al., 2022). For the purposes of the current research, the definition of body image provided by Gil-Llario et al., (2019) will be used as it encompasses all three components of body image which may help one to generate a more comprehensive understanding of body image.

2.0 The Development of Body Image

Two of the most prominent theories in the literature seeking to explain the development of body image are the social comparison theory (Festinger et al.,1954) and more recently, the developmental theory of embodiment (Piran, 2017). In the social comparison theory, Festinger et al., (1954) suggest that as children progress through childhood, they engage in social comparisons in which they often compare their own abilities, differences, strengths, and weaknesses to their peer group. By the time children reach age seven or eight they engage in these comparisons more frequently and these comparisons become more evaluative in nature (Tatangelo et al., 2015). Consequently, by age seven and eight children begin to experience body dissatisfaction and thus are more susceptible to experiencing lower levels of self-esteem and higher levels of negative affect (Tatangelo et al., 2015).

The Developmental Theory of Embodiment provides a more innovative and recent perspective on the development of body image in addition to the ways that girls and women inhabit their bodies across the lifespan (Piran, 2017). Specifically, the theory suggests that the

socialization of women and girls shape the experiences they have in their bodies via three main pathways, namely, experiences in the physical domain which consists of freedom in physical engagement and attuned self-care, experiences in the mental domain, and experiences directly related to social power and relational connections, The present research will solely focus on the experiences of girls in the physical domain as this domain is the most strongly related to body image (Piran, 2017).

The current research is framed in accordance with The Developmental Theory of Embodiment. However, The Objectification theory and the Tripartite Model are two alternative theories that have also been used extensively in past research to explain the development of body image. The objectification theory contends that self-objectification occurs when women perceive their bodies from a third-person perspective and direct their focus towards their physical appearance rather than other aspects of themselves (Calogero, 2012). The Tripartite Influence model of body image (Thompson et al., 1999) proposes that appearance dissatisfaction can emerge as a result of viewing content that glorifies appearance ideals. These ideals are often internalized by women prompting them to engage in negative appearance comparisons with others who fit the ideal and therefore, perceived to be more attractive.

2.0.1 Freedom in Physical Engagement

A large body of research revealed that women and girls who experience freedom in physical engagement by immersing themselves in joyful, non-objectifying, appearance-focused physical activities (e.g., yoga. hiking, biking and team sports) are more likely to experience a positive body image in addition to a heightened sense of physical agency, body awareness, comfort, joy and well-being (Cox & Tylka, 2020; Mahlo & Tiggerman, 2016). Specifically, Mahlo and Triggerman (2016) revealed that yoga practitioners between the ages of 22 and 75

years were more likely to have a positive body image due to the positive influence that yoga practice has on promoting positive embodiment, described as "the experience of comfort and connection with the body, attuned self-care, and bodily agency which in turn may enhance one's self-esteem, well-being, sexuality and spirituality" as defined by Munroe, (2022). Similarly, Cox and Tylka (2020) revealed that yoga practice could promote positive embodiment by helping women to inhabit their bodies from a subjective perspective by focusing their attention on their internal bodily experiences as opposed to objectifying their bodies by directing their attention towards their physical appearance.

2.0.2 Attuned Self-Care

Another aspect of the physical freedom domain that relates to positive body image is attuned self-care, specifically, the extent to which one engages in mindful self-care practices in an effort to maintain a balance between internal physiological, emotional and cognitive experiences of the self with external demands, supports, and challenges presented by family, friends, community and culture (Balciuniene et al., 2021; Cook- Cottone, 2015; Piran, 2017; Tylka & Homan, 2015). For example, Piran (2017) revealed that individuals who engaged in attuned self-care were more likely to experience positive embodiment and thus have a positive body image. In contrast, girls who neglected the care of their bodies were more likely to experience disembodiment and this pattern of behavior often transgressed into adulthood. This finding was suggested to be grounded in the pressure society places on women and girls to conform to their "roles" as caretaker and fulfill domestic duties, such as the care for others at the expense of taking care of their physical health by engaging in physical activities, getting adequate rest or pursuing academic aspirations (Piran, 2017).

Additionally, Tylka & Homan (2015) conducted a quantitative study which used path and mediation analysis to examine the influence that exercise motives had on fostering positive embodiment in females aged 18-47 years old. Exercise motives were assessed using The Function of Exercise Scale, body appreciation was assessed using the BAS-2 and intuitive eating was assessed using the Intuitive Eating Scale. The results of the study showed that females who practiced attuned self-care through engagement in attuned exercise were more likely to experience a positive body image. Specifically, the results suggested that girls who adequately nourished and hydrated their body prior to engagement in exercise, practiced mindful self-awareness and stayed in the present moment during exercise were more likely to have a positive body image. The positive relationship between engagement in attuned exercise and positive body image was reiterated by Balciuniene et al., (2021). Their research also demonstrated that female university students who engaged in a variety of physical activities, such as strength training, yoga and endurance workouts were more likely to have a positive body image if their exercise aligned with the principles of attuned exercise and mindfulness. Therefore, when it comes to attuned self-care, it is important that the relationship that adolescent girls have with physical activity encompasses the different aspects of mindfulness, namely, remaining in the present moment and adequately nourishing and hydrating their bodies prior to participating in physical activity.

2.1 The Evolution of Body Image Across the Lifespan

During puberty, the body image of girls and boys evolves as they begin to experience rapid fluctuations in their body's size and appearance in addition to their self-concept, mood and social interactions (Forney et al., 2019; Ganesan et al., 2018; Tatangelo et al., 2015). These changes are difficult for adolescents to cope with, especially adolescent girls as they are often

incongruent with societal beauty ideals which promote a thin body type (Tatangelo et al., 2015). Pregnancy is another significant period of physical evolution that influences the body image of women (Plante et al., 2020; Tatangelo et al., 2015). For example, Tatangelo et al., (2015) suggested that as women progress through pregnancy their body image improves, and they experience higher levels of body satisfaction. This is premised on the fact that women often view the changes taking place in their bodies in a positive manner as they serve as an indication that their baby is healthy. Finally, as women progress into menopause during their 40s and 50s, they often experience heightened levels of body dissatisfaction (Erbil, 2018; Tatangelo, 2015; Vincent et al., 2023). This has been suggested to be grounded in the fact that the weight gain that often accompanies menopause is also incongruent with the widely promoted thin ideal in Western society (Tatangelo et al., 2015).

Overall, the research above suggests that women may struggle to cultivate a positive body image across the lifespan. When it comes to adolescent girls, puberty may trigger body image struggles due to the rapid physical (e.g., weight gain) and psychological changes (e.g., self-esteem) that they often experience during this time. Thus, interventions aimed at helping girls cultivate a positive body image may be particularly important during puberty.

2.2 Assessment of Body Image

Body image is commonly evaluated using measures of body satisfaction and weight satisfaction or body image discrepancy. Body satisfaction refers to one's self-rated assessments of their satisfaction with their weight, shape, face, height, build and other specific body parts (Robbins et al., 2017). Weight satisfaction or body image discrepancy refers to the discrepancy between one's perception of their current or actual body size and the ideal thin body type and has been identified as a main determinant of body image dissatisfaction (Robbins et al., 2017).

2.3 Negative Body Image

Negative body image is one's fixation, concern, negative appraisals and feelings regarding one's body, stemming from the body shame one may feel when they perceive specific personal characteristics, attributes and behaviours to be undesirable and as such a target for negative evaluation by others (Linardon et al., 2021). The relationship between body shame and negative body image is rooted in the self-objectification theory which suggests that body shame emerges from the internalization of the thin body type ideal that is heavily promoted in Western society (Calogero, 2012; Linardon, 2021; Schaefer et al., 2018). As a result, one frequently self-monitors their body, observing it from a third person perspective, raising their susceptibility to experiencing heightened levels of body shame, appearance anxiety, poor interoceptive awareness, increased negative affect, and increased depressive symptoms (Linardon et al., 2021).

2.3.1 Psychological Correlates of Negative Body Image

Numerous psychological, physiological, and socio-cultural determinants of negative body image or body image dissatisfaction among adolescent girls and boys were identified by Tewari et al., (2022) in a systematic review on the development and maintenance of body image. On a psychological level, adolescents who exhibit high levels of neuroticism were more likely to be highly conscious of their bodies and thus display a heightened sensitivity to the negative opinions of others regarding their bodies' physical appearance (Allen & Walter, 2016; Dalley et al., 2009; Kvalem et al., 2006; Tewari et al., 2022). Self-disgust, specifically, an aversion to one's own specific body features that one perceives as undesirable or imperfect has also been suggested to be positively correlated with body dissatisfaction. This may be attributed to the avoidance behavior (i.e, the resistance of re-evaluating, thinking, and appreciating their

appearance in a positive manner) in which individuals who exhibit self-disgust engage in (Akram et al., 2022; Clark & Varese, 2019; Stasik-O'Brien & Schmidt, 2018; Tewari et al., 2022).

Previous research has also highlighted self-esteem as a correlate of negative body image (Szabo, 2015; Tewari et al., 2022). Notably, the findings of Tewari et al., (2022) revealed that adolescents who exhibited high levels of self-esteem were less vulnerable to experience body image dissatisfaction as they were more likely to accept themselves unconditionally regardless of what their body looked like or what society deems as attractive.

2.3.2 Physiological Correlates of Negative Body Image

Tewari et al., (2022) have also identified physiological correlates of body image. For example, various researchers have reported that early puberty in females and late puberty in males was suggested to be a determinant of negative body image or body image dissatisfaction (Lee et al., 2015; Mercader-Yus et al., 2018; Tewari et al., 2022). This was suggested to be grounded in the strong desire of females to adhere to the widespread thin body type ideal and men's desire to adhere to the muscular body type ideal. Negative body image has also been suggested to be more prominent among women as they progress through pre-pregnancy, post-partum and pregnancy periods when they often experience rapid fluctuations in their bodies' physical appearance (Tewari et al., 2022).

Body Mass Index (BMI) was also identified as a physiological correlate of negative body image, specifically, both low and high BMI values were suggested to be correlated with higher body image dissatisfaction among both men and women (Kantanista et al., 2015; Tewari et al., 2022; Watkins et al., 2008). This is grounded in the tendency of men to idealize mesomorphic bodies with high BMI numbers (more muscle and less fat) and the desire of women to achieve low BMI values. For example, Kantanista et al., (2015) revealed that an increase in adipose

tissue and thus BMI during adolescence was associated with a more negative body image among adolescent girls. This increase in body fat may cause discomfort during some forms of PA and thus decrease adolescent girls' engagement in physical activity. Furthermore, Watkins et al., (2008) found that underweight, overweight, and obese college men reported significantly higher levels of body dissatisfaction, a strong indicator of negative body image, than that reported by normal-weight participants. This study mirrors the results of a more recent descriptive cross-sectional study by Mohamen and Idrees, (2023) which investigated the relationship between body image dissatisfaction and BMI among female medical students. The results of the study revealed that participants wbo were underweight, overweight, or obese were more vulnerable to experiencing a poor body image perception.

2.3.3 Sociocultural Correlates of Negative Body Image

The specific motivation underlying an individual's intention to participate in PA has also been suggested to be correlated with negative body image in adolescents (Alleva et al., 2021; Tewari et al., 2022; Vartanian et al., 2012). Specifically, women who engage in physical activity with the intention of altering their physical appearance and losing weight have been suggested to be more likely to experience body image dissatisfaction and thus negative body image. On the other hand, women who participate in physical activity for functional reasons, namely, improving their physical fitness and overall health and wellbeing are less likely to experience negative body image (Tewari et al., 2022).

The relationship between participating in physical activity for enjoyment and body image has also been well-established in past research. For example, Bevan et al., (2021) found that experiences of weight stigma, namely, being teased about one's appearance or weight was positively related to the desire to avoid participation in physical activity but not enjoyment of

participation in physical activity. These findings emphasize the need to create inclusive and safe physical activity spaces in addition to the need for sport policy and weight interventions designed to target the internalization of weight-related comments. Frisén and Holmqvist (2010) also explored the relationship between physical activity engagement and enjoyment among 30 Swedish girls and boys between the ages 10 and 13. Semi-structured interviews were conducted and analyzed using thematic analysis to uncover what characterized adolescent girls and boys with a positive body image. The results of the study revealed that one's motivation underlying their engagement in physical activity was critical in determining whether engagement in physical activity could promote a positive body image in adolescents. Specifically, adolescents who engaged in exercise because they found it joyful and health promoting were more likely to have a positive body image than those who participated in physical activity as a means of modifying their appearance, such as controlling their weight.

Peer groups have also been suggested to have a strong influence on negative body image (Hutchinson & Rapee, 2007; Kenny et al., 2017; Paxton, 1996; Tewari et al., 2022). This has been attributed to the fact that they serve as key socialization agents who share their perspectives on body image and what constitutes an "acceptable" body, prompting their peers to compare their own bodies and specific body parts against what their peer groups deem as acceptable (Tewari et al., 2022). Additionally, children who experience teasing and rejection towards their body's appearance growing up were suggested to be more vulnerable to experience negative body image as these external comments often shape the inner perceptions that children have of their bodies.

Mothers have also been suggested to have a prominent influence on their daughters' body image (de Vries et al., 2019; Gil-LIario et al., 2019; Maor & Cwikel, 2016). Most notably,

Gil-Llario et al., (2019) revealed that adolescent girls were more likely to experience a negative body image and exhibit heightened levels of body dissatisfaction if their mothers were dissatisfied with their bodies. This has been attributed to the fact that mothers act as key socialization agents and role models for their daughters and thus transmit their perceptions of their own bodies and body image to that of their daughters. Additionally, Maor & Cwikel (2016) revealed that adolescent girls were more likely to have a positive body image if their mothers taught them to challenge social discourses regarding body image and practice positivity by encouraging their daughters to direct their focus away from food, body size and weight loss and focus on making healthy decisions and enjoying food.

In summary, the research above highlights the correlates of negative body image among adolescents that exist on a psychological, physiological, and socio-cultural level. However, it is important to note that the research was not age-specific and thus it is difficult to determine if the correlates of negative body may vary, specifically as it relates to adolescent girls.

2.4 Correlates of Negative Body Image in Adolescent Girls

2.4.1 Media Literacy and Negative Body Image

Exposure to appearance related content on social media platforms has also been identified as a major determinant of negative body image among adolescent girls (Choukas-Bradley et al., 2022; Fardouly et al., 2015; Tiggermann et al., 2013). For example, Fardouly et al., (2015) revealed that women between the ages of 18 and 25 in Australia who frequently viewed fitspiration images on Instagram were more likely to have body image concerns. Additionally, it was reported that women between 18 and 30 years old who viewed unrealistic images of other women that had been edited to resemble an idealized image were more likely to experience body dissatisfaction in comparison to women who viewed realistic and unedited images of the same

women (Tiggermann & McCourt, 2013). Interestingly, Meier & Gray (2014) revealed that the relationship between media exposure and negative body image in adolescent girls was dependent on their pattern of use. Specifically, the findings suggested that the amount of time girls allocated to photo activity (e.g., liking and commenting) on other's photos was a stronger determinant of body image issues than the total time that adolescent girls spent on Facebook or the internet. Additionally, Marengo and colleagues (2018) revealed that the use of highly visual social media platforms (e.g., Instagram and Facebook) was a stronger determinant of negative body image than television or magazine exposure. These results may be explained by the Self Objectification Theory which suggests that females objectify images seen on social media, prompting them to view their physical appearance from an outsider's perspective (Fredrickson & Roberts, 1997).

Due to the prominent influence that social media has on triggering negative body image among adolescent girls, media literacy training has been acknowledged as an important strategy that may improve the harmful impact that the media may have on the body image of adolescent girls. Specifically, media literacy training is characterized by augmenting one's ability to critically analyze and challenge the presentation of idealized bodies and lifestyles, and to further acknowledge the unattainability of the extreme body ideal and has been used as part of numerous body image interventions (Paxton et al., 2022; Uhls & Robb, 2017).

2.5 Positive Body Image

Positive body image is a multifaceted concept that consists of different components, namely, body appreciation, body image flexibility and body acceptance. Body appreciation refers to the appreciation of what one's body can do as opposed to its physical appearance (Tylka & Wood-Barcalow, 2015). Body flexibility refers to one's willingness to embrace rather than avoid unpleasant perceptions, feelings, and thoughts about their body (Webb et al., 2014). Lastly, body

acceptance pertains to one's ability to express acceptance of and comfort with their body, even if they are not entirely satisfied with their body (Tylka & Wood-Barcalow, 2015).

The attainment of a positive body image is of utmost importance as it has been suggested to augment one's self-esteem, engagement in intuitive eating and positive affect in addition to improving one's relationship to their body either directly or indirectly by reducing self-objectification (Longhurst, 2021). Furthermore, numerous studies have revealed that specific components of positive body image (e.g., body appreciation) were associated with increased engagement in health-promoting behaviours (e.g., sleep hygiene, meditation) and decreased engagement in maladaptive beliefs and behaviours (e.g., perfectionism, disturbed eating patterns) and depressive symptoms (Longhurst, 2021; Yahia et al., 2011).

Additionally, a large body of research has underlined the relationship between positive body image and multiple determinants of psychological wellbeing, namely, human flourishing, physical self-perception, self-compassion, and intuitive eating (Longhurst, 2021; Stevens & Griffiths, 2020; Sugita & Iwamitsu, 2021; Weiss, 2019). Most notably, Longhurst et al., (2021) revealed that a positive body image was also suggested to be associated with a greater degree of human flourishing, namely, establishing a mindful connection with one's body, both internally and externally. Additionally, Sugita & Iwamitsu (2021) revealed that individuals with a positive body image were more likely to have better physical self-perceptions and engage in more self-care behaviors targeted towards augmenting and maintaining their health and wellbeing. While it appears that having a positive body image is central to one's overall health and wellbeing, more research is needed on the relationship between positive body image and engagement in PA, especially for adolescent girls who are particularly vulnerable to experiencing negative body image.

2.5.1 Measurement of Body Appreciation

The prominent role that body appreciation has on helping girls and women cultivate a positive body image has been well documented in previous research (Andrew et al., 2016; Halliwell, 2013; Tiggerman & McCourt, 2013; Tylka & Wood-Barcalow, 2015), thereby supporting the second edition of the Body Appreciation Scale (BAS-2) as a valid means of assessing one's positive body image. For example, research has revealed that women who exhibit high levels of body appreciation, specifically, valuing their body and directing their thought processing towards protecting the body and exhibiting a positive view of the body were more likely to critique unrealistic appearance ideals depicted in the media and resisted consuming appearance-focused media (Paxton et al., 2022; Richardson et al., 2009). The protective role that body appreciation has in helping one to cultivate a positive body image was reiterated by Halliwell et al., (2013). This study was conducted to determine whether a positive body image can protect women from the negative influence of the media on body image. The sample was comprised of 112 female university students with a median age of 20 years old. Body appreciation was assessed using the Body Appreciation Scale and The Self-Discrepancy Index was used to measure appearance discrepancies (i.e, discrepancies in how they would like to look in comparison to how they actually looked). The results of the study revealed that college women who exhibited lower levels of body appreciation placed significantly more importance on their appearance discrepancies after being exposed to images of thin female models. In comparison, women who exhibited high levels of body appreciation directed less of their attention to appearance-based discrepancies. These findings shed light on the protective role that body appreciation has on helping one cultivate and maintain a positive body image, in turn, serving to underline the validity of the second edition of the Body Appreciation Scale (BAS-2)

as a measure of body appreciation in Western countries. Additionally, the BAS-2 has been suggested to exhibit a high degree of internal validity as internal reliability coefficients (Cronbach Alphas) of .90 and above have been found for both women and men in the U.S and Australia.

The BAS-2 also corrects for some of the weaknesses of the older version of the BAS. The main limitations of this scale included the confusing wording of some items which may have been interpreted differently by different participants (Tylka &Wood-Barcalow, 2015). For example, item number 9, "I do not focus a lot of energy on being concerned with my body shape or weight" suggested that individuals who have a positive body image do not direct any of their attention towards their weight and shape (i.e., the opposite of negative body image). However, more recent research has revealed that women with a positive body image do, in fact, place attention on body weight and shape in a positive manner as they believe that all body types should be acceptable and celebrated and not because their body resembles the sociocultural thin ideal body type (Tylka &Wood-Barcalow, 2015). Overall, the strong relationship between body appreciation and positive body image outlined in the research above, in addition to the limitations of the older version of the BAS, provide support for BAS-2 as a strong and valid measure of positive body image (Tylka & Wood-Barcalow, 2015).

2.5.2 Semi- Structured Interviews and Body Appreciation

There is a vast amount of both qualitative and quantitative literature on body image However, Corbin and Strauss (2008) suggest that it may be useful to assess body appreciation using qualitative methods, such as semi-structured interviews as qualitative research methods have been shown to help the researcher gain a richer understanding of positive body image and how it is shaped by an individual's experiences, culture and values. Additionally, the researcher

interacts directly with participants during qualitative data collection and, as a result, the data is more detailed. The use of semi structured interviews is also more flexible than quantitative research methods as it allows participants to authentically express how they feel (Grogan, 2021).

2.5.3 Correlates of Positive Body Image

Self-Compassion. Self-compassion is one's ability to perceive their suffering as inevitable and part of the human experience, without avoiding it or distancing oneself from it in addition to one's desire to alleviate it with kindness in the absence of judgment (Pila et al., 2022). Furthermore, Pila et al., (2022) proposes it entails three main components, which are: mindfulness, common humanity, and self-kindness. With regards to body image, mindfulness refers to one's ability to observe their thoughts and feelings (including body-related ones) without judging or over-identifying with them. Secondly, common humanity has been defined as one's ability to understand and perceive thoughts, such as worries about weight, as mutual and thus feel more connected to others. Lastly, self-kindness pertains to one's ability to express kindness towards oneself, take care of oneself and accept one's mistakes (Pila et al., 2022).

As such, Bailey et al., (2019) identified several strategies that can be used to help adolescent girls cultivate more self-compassion towards their bodies. For example, providing girls with self-compassionate writing prompts has been suggested to be effective in helping adolescent girls express deeper levels of self-compassion towards their bodies. Additionally, providing adolescent girls with adequate resources and education on self-compassion has also been suggested to help adolescent girls cultivate a positive body image by helping them generate a broader understanding of what constitutes an "attractive" body type, in turn, increasing the likelihood that they will continue to participate in physical activity during adulthood (Bailey et al., 2019)

Self-esteem. Self-esteem has also been identified as a strong correlate of positive body image, particularly, body appreciation (Sundgot-Borgen et al., 2020; Lowery et al., 2005; Pop, 2016). For example, Sundgot-Borgen et al., (2020) revealed that Norwegian adolescents who participated in a self-esteem intervention designed to enhance students' ability to identify and appreciate individual differences, appreciate their own positive controllable characteristics, and develop positive attitudes and evaluation of themselves was effective in promoting a positive body image. As such, body image interventions should target increasing self-esteem to help individuals cultivate a deeper appreciation and positive connection to their bodies, despite unhealthy exposures.

Additionally, Lowery et al., (2005) examined the relationships among self-esteem, body image, exercise, and other health-related behaviors in first-year male and female college students. Results of the study showed a significant correlation between body image measures (i.e, the Objectified Body Conciousness Scale and the Weight and Appearance Visual Analogue Scale) and self-esteem for girls assessed using the Rosenberg Self Esteem Scale. Specifically, girls who had low self-esteem scores were more likely to engage in body surveillance, viewing their bodies from an outsider perspective and thus exhibited heightened levels of body dissatisfaction and body shame (i.e, felt bad about their bodies).

Body Image Flexibility. Body image flexibility is described as one's ability to experience a variety of perceptions, feelings, thoughts, and beliefs related to the body and still act in accordance with chosen personal values without trying to change or avoid any negative thoughts (Linardon et al., 2021; Sundgot-Borgen et al., 2020). The construct has been found to positively associate with positive body image, specifically body appreciation and has been

negatively associated with negative body image, disordered eating, psychological rigidity and affect regulation (Linardon et al., 2021; Sundgot-Borgen et al., 2020).

Sport Mediatization. The popularity of a sport in the media may also influence components of women's body image, namely, body appreciation. This may be grounded in the pressure women may feel to look good in sports that receive a lot of media attention (Budzisz et al., 2021).

2.6 The Canadian 24-Hour Movement Guidelines

The Canadian 24-Hour Movement Guidelines recommend that children and youth five to seventeen years old engage in MVPA at least 60 minutes per day, have less than two hours per day of screen time and obtain nine to eleven hours of sleep per night between the ages of five and thirteen and obtain eight to ten hours of sleep per night between the ages of 14 and 17 (Janssen et al., 2017). Notably, these guidelines were developed by the Canadian Society for Exercise Physiology (Janssen et al., 2017) to provide objective targets for individuals striving to live a healthy lifestyle and to inform health care professionals and researchers on what constitutes a healthy lifestyle.

These guidelines were also developed to promote a holistic and multidimensional approach to one's health, specifically, individuals are encouraged to adhere to all three movement recommendations to promote healthy development, not just one or two. For example, a child who is getting the recommended amount of sleep per night but is not participating in the suggested amount of PA throughout their day cannot be classified as exhibiting a healthy movement behavior profile (Janssen et al., 2017). Adherence to these guidelines is pivotal to maintaining good health and has been associated with numerous positive health outcomes,

including body composition, physical fitness, academic achievement, cognition, emotional regulation, prosocial behaviours, cardiovascular and metabolic health, and overall quality of life.

Despite these benefits, however, only 17.5 percent of Canadian youth meet all three of the Canadian 24-Hour Movement Guidelines (Janssen et al., 2017). This is concerning given that a lack of adherence to these guidelines has been associated with a multitude of preventative health problems (Colley et al., 2013). This was exemplified by Roman-Vinas et al., (2016) who revealed that children who did not meet the three recommendations were 72% more likely to be obese than those who did meet them. Furthermore, the findings revealed that children who adhered to any combination of two of the recommendations were less likely to become obese in comparison to children not meeting the recommendations. Similarly, Janssen et al., (2004) revealed that decreased physical activity participation and increased television viewing time was associated with obesity in a nationally representative sample of Canadian children.

2.7 Physical Activity

Physical activity (PA) refers to a range of bodily movements that require the expenditure of energy and may occur in a variety of different contexts, such as during participation in sports, leisure time, transporting to and from places as well as during one's work (WHO, 2020). The importance of PA participation has been well documented in past research which has illuminated the numerous mental, social and physical health benefits. For example, Di Bartolomeo and Papa (2019) revealed that participation in PA was effective in decreasing one's risk of acquiring certain diseases in addition to improving one's cognitive functioning. Furthermore, Higgins et al., (2003) found that participation in PA played a protective role in preventing one from engagement in a variety of unhealthy behaviors, such as reduced smoking initiation among female adolescents and the prevention of smoking among males later in adulthood. With regards

to mental health, a quantitiative study by Higgins et al., (2003) used correlational and regression analysis to analyze data from the National Population Health Survey (NPHS). This survey consisted of sociodemographic data, health determinants, health status and health behaviors including those related to physical activity engagement among female and male Canadians aged 12-24 years. The results of the study revealed that youth who engaged in PA were less vulnerable to experiencing depression which was measured using The 6 Item Scale of Depressive Symptoms in comparison to their peers who did not participate in PA. Consequently, they were less likely to resort to unhealthy behaviors such as substance abuse or smoking to help cope with it. Furthermore, Cecchini et al., (2017) demonstrated that adolescent girls (aged 12-13) who participated in moderate to high intensity PA (i.e., more than 60 minutes per day) were less likely to report depressive symptoms than girls who participated in low intensity PA or no PA at all. This was attributed to the ability of PA to augment one's self-esteem, self-concept and body image in addition to the goal setting environment that PA provides which has been suggested to enrich one's sense of accomplishment (Cecchini et al., 2017).

2.7.1 The Importance of PA Participation for Adolescent Girls

The decline in the physical activity levels of adolescent girls is of great concern, given the plethora of mental, physical and social benefits associated with engagement in PA (Abdelghaffar et al., 2019; Cecchini, 2017; Costigan et al., 2019; Lau et al., 2019; Weiss et al., 2019). Weiss and colleagues (2019) revealed that a running club entitled Girls on the Run, consisting of more than 200 clubs across 50 states was effective in augmenting the psychological and physical skills of girls in grades three to five and middle school. Girls who participated in the program experienced marked increases in their physical health (e.g., being more active and physically fit), nutrition (e.g., not eating as much junk food), emotional (e.g., controlling anger,

managing peer pressure), mental health (e.g., increased motivation and setting goals) and social health (e.g., the formation of a stronger core friend circle). Girls on the Run also helped girls establish meaningful connections to their communities as participation in the club encouraged them to volunteer with vulnerable sectors and help others in need (Weiss et al., 2019).

Additionally, Lau et al., (2019) propose that participation in sports, particularly team sports is effective in decreasing adolescent girls' engagement in negative health behaviors, such as substance abuse. This was suggested to be grounded in the role that team sports play in fostering positive social interactions with a coach and pro social peers. Cecchini et al., (2022) reiterated the protective role that participation in PA has on the physical and mental health of adolescent girls. The findings revealed that girls aged 15-18 years who participated in high intensity physical activity in addition to moderate intensity PA were less likely to report depressive symptoms which were assessed using the 6-Item Scale of Depressive Symptoms. In comparison, girls who participated in low intensity physical activity were more likely to report depressive symptoms, after controlling for confounding variables, namely, BMI and smoking. The findings of this research also revealed that girls who showed the most prominent depressive symptoms were sedentary for more than 11 hours per day (Cecchini et al., 2022).

2.7.2 Barriers to PA Participation Among Adolescent Girls

The Canadian 24-Hour Movement Guidelines in addition to the World Health Organization (WHO) suggest that participation in PA decreases with age for both genders (Marques et al., 2020). However, it has been suggested that adolescent girls experience the steepest decline (Cowley et al., 2021; Lawler et al., 2021; Owen et al., 2018; Wallace et al., 2019). Previous research has outlined several barriers existing on an interpersonal, intrapersonal, social, and organizational level that may contribute to this decline (Cowley et al., 2021). On an

intrapersonal level, adolescent girls may exhibit a fear of being judged and may worry that their athletic abilities will be compared to their peers. They may also experience trouble balancing PA on top of their academic and social commitments as they enter adolescence and thus experience a lack of motivation to participate in PA (Cowley et al., 2021). Adolescent girls' lack of mastery in specific fundamental movement skills, namely, object control skills (e.g., catching and throwing) in comparison to boys has also been identified as a barrier that may hinder girls' participation in physical activity as they enter adolescence (Foley, 2021; Logan et al., 2015). This gender discrepancy has been suggested to be attributed to the fact that society often encourages boys to participate in more sports, especially ball type sports and girls to participate in sports that require more locomotor skills such as running and hopping (Rogers et al., 2018).

Physical self-perception has also been identified as a major barrier hindering the participation of adolescent girls in physical activity with regards to both frequency and intensity (Scheinder et al., 2008; Dejonge et al., 2019; Corr et al., 2019). This has been suggested to be grounded in Harter's Competence Motivation Theory (Rogers et al., 2018) which suggests that individuals are more motivated to participate in activities in which they can feel a sense of achievement, such as sports and academics. As such, individuals who are successful in such activities gain a positive perception and are more likely to participate in such activities in the future. It is important to note, however, that girls' actual physical self-perception is a stronger predictor of PA participation than their perceived physical self-perception alone. As children's cognitive skills develop, their perceived physical self-perception becomes more aligned with their actual skill level (Rogers et al., 2018).

On an interpersonal level, girls may feel that PA or sporting commitments will compromise their ability to spend time with their friends. Additionally, a lack of support from

positive female role models, such as teachers or friends may inhibit their participation in PA (Morgan, et al. 2019; Owen et al., 2018). On an organizational level, the delivery and timing of PA may hinder their participation (Cowley et al., 2021; Wallace et al., 2019). For example, girls may be less likely to participate in PA if it takes place during mid-day or morning, which may not give them sufficient time to shower and get changed (Cowley et al., 2021). Additionally, Wallace et al., (2019) revealed that girls preferred to participate in single gender PE classes in comparison to mixed gender PE classes and consequently, their effort level increased as they spent an increased amount of time in moderate to vigorous physical activity (MVPA) when no boys were present.

Gender inequalities, risk of injury, recognition, lack of opportunities and social stereotypes may also contribute to the decline in PA levels as girls enter adolescence (Cowley, 2021; O'Reilly et al., 2018; Rosselli et al., 2020; Spencer et al., 2015). For example, a review consisting of both qualitative and quantitative studies conducted by Spencer et al., (2015) found that adolescent girls often feel that participation in PA is incongruent with the idea of femininity which encourages girls to appear feminine and act in a feminine manner. Although some girls may challenge these norms, the majority fear that they run the risk of being perceived as overly masculine (referred to as the femininity deficit) if they participate in physical activity. Additionally, Cowley et al., (2021) suggested that girls may not feel as confident in their athletic abilities in comparison to their male peers due to social stereotypes which encourage women to focus more on their academic pursuits and men to focus more on athletic pursuits.
Cowley et al., (2021) also revealed that adolescent girls may fear that participating in PA with boys will increase their risk of becoming injured. Additionally, they often feel that they do not receive as much societal recognition or praise for their athletic pursuits in comparison to their

male counterparts, consequently, decreasing their motivation to participate. Accordingly, O'Reilly et al., (2018) revealed that female sport received significantly less media attention than male sport. An analysis of 35,000 hours of sports programming in Canada revealed that only four percent of sports coverage was dedicated to showcasing female athletes and only 11 percent showcased both genders (O'Reilly et al., 2018). To combat this discrepancy, sports leaders have advocated that the media should not diminish the athletic accomplishments of females or perpetuate any pre-existing stereotypes that may marginalize the athletic pursuits of females. O'Reilly et al., (2018) also revealed that adolescent girls often feel as though they receive less opportunities to participate in PA in comparison to boys and so are less physically active. This raises the need to develop interventions aimed at increasing the PA levels of adolescent girls by acknowledging these barriers.

2.8 Measurement of Physical Activity: Accelerometry

PA is commonly assessed using questionnaires, pedometers and accelerometers. However, accelerometry is the gold standard method used to measure PA as it provides an objective measurement of the physical activity levels of both children and adolescents (Trost et al., 2011). The actigraph accelerometer is the most widely used accelerometer to measure the physical activity levels of free-living children and adolescents (Trost et al., 2011). The device measures and records accelerations of various magnitudes ranging from 0.05 grams to 2.5 grams across time (Trost et al., 2011). Accelerometer output is digitized by an analog to a digital filter at a rate of 30 hertz. Once the signal is digitized, it passes through a digital filter band that restricts the accelerometer to a frequency range of 0.25-2.5 hertz. The filtered signal is then rectified and combined over a user specified interval called an epoch. At the end of each epoch, the "activity count" or added value is stored in the memory of the accelerometer. To measure

physical activity, the actigraph accelerometer is attached to a flexible, athletic belt that is fastened tightly around the participant's waist positioned on the right midaxillary line at the levels of the iliac crest (Trost et al., 2011).

2.8.1 Benefits of Accelerometers

In 2010, 43 million children worldwide under the age of five were estimated to be overweight due to young children's lack of engagement in PA and increased time spent in sedentary behavior (Pagels, 2010). As such, a reliable measure that captures all aspects of children's PA, explicitly, frequency, intensity and duration was needed to clarify the impact that physical activity has on the high obesity rates in children and other markers of health (Pagels et al., 2010). Critically, an objective measure of physical activity is needed for helping researchers and clinicians generate a comprehensive understanding of the relationship between physical activity and improved health outcomes among all age groups. Additionally, the quantification of PA is needed to help clarify whether the relationship between physical activity and improved health is dose dependent. In other words, further evidence is required to understand if moderate to vigorous physical activity (MVPA) yields greater improvements in one's health in comparison to engagement in low intensity PA (Oliver et al., 2009).

Due to the importance of quantifying physical activity levels, objective measures of physical activity such as motion sensors and heart rate monitors have been used. However, motion sensors including accelerometers and pedometers are the gold standard for measuring and documenting the activity levels of both free-living children and adolescents (Pagels et al., 2010). This is due to their unbiased nature in addition to their ability to store information and convenience to handle. Accelerometers also correct for the limitations of pedometers, such as

their inability to provide information on the intensity of PA which is critical for understanding physical activity patterns (Pagels et al., 2010).

2.8.2 Limitations of Accelerometers

Although accelerometers have been deemed the preferred means of quantifying physical activity levels, there are several limitations associated with accelerometer use. Specifically, accelerometers may not accurately measure the movement patterns of some age groups, such as pre-school children and individuals who exhibit immature movement patterns as these groups often engage in short bursts of high intensity PA. Consequently, the longer epoch length that most accelerometers use to record PA behaviors may not accurately measure the highly variable and intermittent PA behaviors of younger children, such as preschoolers. For example, Mahar et al., (2006) revealed that preschoolers spent significantly less time in Moderate to Vigorous Physical Activity (MVPA), Moderate Physical Activity (MPA) and Vigorous Physical Activity (VPA) when their PA behavior was measured using accelerometers with longer 15 second, 30 second, 60 second epochs in comparison to shorter epochs of one, three and five seconds (Oliver et al., 2009).

Another limitation of accelerometers as documented by Oliver et al., (2009) pertains to their inability to accurately capture the TEE (Total Energy Expenditure) of individuals. Specifically, although accelerometers have been deemed as a reliable method of predicting the TEE of groups, the ability of accelerometers to predict free living TEE in children at an individual level has not been widely documented. This has been suggested to stem from the fact that accelerometers lack the ability to adequately estimate behaviors that require large energy output, such as behaviors that involve small trunk movements (e.g., load bearing, moving on an incline, upper body movements and cycling). These limitations may be most pronounced for

uniaxial accelerometry. Trost et al., (2011) contend that accelerometers often misclassify static light to moderate intensity physical activities such as folding laundry or sweeping. In order to combat these issues, research has recommended that combining accelerometry data with other data, such as data obtained from heart rate monitors may yield more accurate estimates of free-living total energy expenditure at both the group and individual levels (Reilly et al., 2006).

2.9 Physical Activity and Body Image

A large body of research has explored the impact of physical activity on body image which has suggested that PA often exacerbates body image concerns among adolescent girls (Foley, 2021; Koulanova et al., 2021; Pila et al., 2021; Vani et al., 2021). For example, Pila et al., (2020) revealed that girls who experienced weight related shame (i.e., the presence of negative attitudes and beliefs around one's body) reported lower levels of PA from baseline to follow up. Additionally, Vani et al., (2021) revealed that adolescent girls often experienced elevated body related self-conscious emotions, such as, shame, guilt, and embarrassment in PA and sport contexts causing them to drop out of physical activity.

Despite the negative impact that participation in PA may have on the body image of adolescent girls, other recent research has suggested that participation in PA may help adolescent girls cultivate a positive body image (Balciuniene et al., 2021; Manzano-Sánchez et al., 2022; Robbins et al., 2017). For example, Robbins et al., (2017) suggested that participation in PA at a sufficient intensity level helped facilitate the development of a positive body image among adolescent girls by improving their cardiovascular fitness and reducing their body fat levels, which, in turn, improved their body image. This relationship may be explained by the fact that losing weight helped them fit the idealized thin body type ideal. Furthermore, Balciuniene et al., (2021) revealed that participation in an intervention program entitled "Body and Mind" designed

to educate adolescent girls on healthy exercise and mindful PA was effective in fostering the development of a positive body image by decreasing the extent to which they internalized widely accepted societal beauty ideals. Finally, Manzano-Sánchez et al., (2022) revealed that adolescent girls who participated in PA were less likely to restrict their consumption of specific foods. Additionally, this research revealed that body-image disorders were more prevalent among adolescent girls who spent less time participating in moderate to vigorous physical activity and had more than two hours a day of screen time.

2.9.1 The Role of Positive Embodiment

The positive impact that PA has on improving the body image of adolescent girls has been grounded in the fact that participation in PA may foster a sense of positive embodiment (Cox & Tylka et al., 2020; Munroe, 2022; Paulson & Greenleaf, 2022). This has been described as the experience of comfort and connection with the body, attuned self-care, and body agency which in turn may enhance one's self-esteem, well-being, sexuality and spirituality (Piran, 2017). It is important to note, however, that the relationship between PA and positive embodiment has been suggested to be moderated by peer groups and the specific nature of physical activity. For example, Munroe et al., (2022) contends that in order to instill a sense of positive embodiment among individuals, PA settings (e.g., yoga studios) should prioritize promoting enjoyment over weight goals in order to maintain one's desire to participate. Yoga and physical activity settings should also be designed to promote exercise, nutrition and sleep to enhance self-care habits as opposed to advocating for extreme exercise and diets (Munroe et al., 2022). Peer groups also play a pivotal role in determining the ability of PA to facilitate positive embodiment as peer groups often create their own norms surrounding the body and thus may influence the extent to which one accepts the widely promoted thin body type ideal (Munroe et al., 2022).

2.9.2 Exercise Motivation

The ability of PA to promote positive body image has been suggested to be contingent on the specific type of motivation underlying one's participation in PA. For example, women who participate in exercise for functional reasons, such as improving their level of athleticism and fitness have been suggested to be more likely to experience a positive body image (Tewari et al., 2022). On the other hand, women who exercise for external goals, such as appearance modification or social recognition are more likely to experience body image concerns (Tewari et al., 2022; Tylka & Homan et al., 2015).

2.9.3 Training Frequency

The ability of PA to promote positive body image may also be moderated by the frequency of PA. For example, Budzisz et al., (2021) revealed that female athletes who trained frequently, explicitly, more than nine times a week were less likely to experience a positive body image. This was suggested to be grounded in the specific motivation underlying their training schedules as it is likely that women training more than nine times per week may have been primarily motivated to achieve a leaner body, not solely to improve their current level of fitness or athleticism.

2.9.4 Nature of Sport Competition

The ability of PA to facilitate a positive body image among adolescent girls has also been suggested to be contingent on the nature of sport competition. Specifically, body appreciation, a key component of positive body image, has been found to be significantly higher in sports characterized by an indirect nature of competition where the goal of competition is to obtain a result (e.g., track and field) in comparison to direct sports (e.g., volleyball) where the goal of competition is the direct defeat of the competitor(s) for each point Budzisz et al., (2021).

Additionally, Kantanista et al., (2018) suggest that the level of sport competition is a significant determinant of positive body image, that is, athletes who competed at an international level were found to be more likely to exhibit a positive body image in comparison to those who performed at a national level. This was suggested to be attributed to the fact that athletes competing at an international level likely have more experience and a heightened awareness of their bodies in comparison to athletes competing at lower levels and thus a more positive body image (Kantanista et al., 2018).

2.9.5 Type of Physical Activity

The relationship between PA participation and positive body image has also been suggested to be moderated by the specific type of PA (Budzisz et al., 2021; Kong & Harris, 2015; Kantanista et al., 2018). For example, Budzisz et al., (2021) found that female athletes who participated in individual sports (e.g., canoeing, track and field) exhibited the highest levels of body appreciation in comparison to non-individual sports (e.g., volleyball or hockey). In contrast, body appreciation was highest for males who participated in team sports as opposed to individual sports. This was attributed to the training environment. Specifically, in team sports (e.g., volleyball) women are in a gender homogenous group comprised solely of women and a coach and thus they may feel less compared to their male counterparts in terms of appearance and athletic abilities. In comparison, in individual sports such as track and field female and male athletes train together which may act as a site for comparison (Budzisz et al., 2021).

Kong & Harris (2015) propose that body image concerns may be more prominent in specific types of physical activity, namely, aesthetic sports or endurance sports where a lower body weight is often a determinant of better sports performance, regardless of participation level. This may also be attributed to the prevalence of mirrors and pictures of the idealized thin or

muscular bodies in aesthetic sports that may trigger self-objectification. Interestingly, however, Kantanista et al., (2018) found that highly trained female athletes competing in aesthetic sports were more likely to have a positive body image. A possible explanation for these results pertains to the fact that female athletes in aesthetic sports likely had a lower BMI than athletes in nonaesthetic sports and thus were more likely to conform to the idealized thin and fit body type that is heavily promoted in Western society. As a result, athletes in aesthetic sports may be more satisfied with their bodies' appearance.

2.9.6 Age

Kantanista et al., (2018) revealed that the ability of participation in PA to alleviate body image concerns may also be moderated by age. Specifically, negative body image perception was more prominent among younger female athletes which was suggested to be a consequence of puberty in which their body fat levels increase. On the other hand, older athletes who had more experience in highly competitive sports environments and higher levels of confidence in their athletic abilities expressed less body dissatisfaction and a more positive body image. It is important to note, however, that the relationship between age and improved body image perception may be moderated by other factors. For example, athletes who have coaches who make negative weight related comments may be more prone to experience body image dissatisfaction and negative body image regardless of their age (Kantanista et al., 2018).

2.9.7 Body Talk

Appearance-related body talk in PA settings has also been suggested to deter the ability of PA participation to alleviate body image concerns. In fact, body talk from parents and coaches was suggested to perpetuate negative attitudes and feelings toward the body, promoted the importance of body appearance, encouraged body comparisons, and perpetuated weight stigma

(Smith et al., 2024; Puhl & Lessard, 2020). Additionally, it is important to note that both positive and negative comments may hinder the ability of PA to improve one's body image. Specifically, athletes who received "positive" compliments regarding their appearance from parents or coaches (e.g., being told their body looks great as their strength improves) or blatant negative comments (e.g., recommendations to lose weight) were equally as likely to experience body image concerns. This was suggested to be premised on the fact that both types of body talk reinforce the notion that improved body functionality may equate to desirable appearance-based changes in line with sports-specific body ideals (Lucibello et al., 2021). Body talk from parents was also identified as a culprit for promoting body image concerns in PA settings. For example, the attitudes and opinions that girls expressed towards higher weight peers in PA settings was strongly influenced by their mothers' attitudes and behaviors.

Chapter 3 - Methodology

A mixed-methods study design was used throughout this research study. This study examined the type and intensity of physical activity of adolescent girls aged 12 to 17 years. Data was collected over a period of one month during the 2023-2024 school year.

3.0 Methodological Considerations

It is important to ground research within a specific theoretical framework to guide data collection and analysis (Clarke et al., 2019). As such, a Critical Realist perspective was chosen to inform the analysis of the present research (Clarke et al., 2019). This philosophical framework contends that there is a pre-existing external reality, but our knowledge of that reality is influenced by our own perspective and experiences and, as a result, is always incomplete, and inaccurate (Mukumbang, 2023). As such, our observations of this pre-existing social world are shaped by both our senses in addition to our personal, social, historical and cultural experiences

(Mukumbang, 2023). Framing research within a critical realist perspective helps researchers effectively combine both quantitative and qualitative research methods and findings to generate a deeper understanding, description and explanation of the social phenomenon under investigation in mixed-methods research (Brunson et al., 2023).

In accordance with this framework, when analyzing the data, I acknowledged that each participant's words reflected their own perspectives and experiences and therefore cannot be extrapolated to represent other individual's interpretations or experiences regarding physical activity participation and body appreciation. I considered this philosophical perspective to be a good fit as this research seeks to investigate the unique experiences and perspectives of participants.

3.1 The Mixed Methods Research Design

An exploratory mixed methods research design was chosen for the present study. In this design, the collection and analysis of qualitative data was conducted first and then expanded upon with the quantitative data and tested and generalized with the initial findings (Creswell et al., 2007). A mixed methods research design helps to enrich the study findings as qualitative data can add context and meaning to the statistical results from the quantitative data by examining the perspectives of participants more deeply (Ivankova et al., 2006).

3.2 Research Questions and Objectives

The purpose of this research study was to explore the impact that participation in physical activity has on the body image of adolescent girls. Specifically, this research examined 1) the relationship between physical activity participation and body image among adolescent girls; and 2) whether participation in specific types or intensities of PA are more effective than others in helping girls cultivate a positive body image.

3.3 Inclusion Criteria

Participants qualified to participate in the study if they were female, at least 12 years of age and no older than 17 years of age, attending school in the province of Newfoundland and Labrador, Canada, and English is their first language for speaking and reading. Although body image concerns are prevalent among both males and females, previous research has shown a higher incidence of body image concerns among girls (Cowley et al., 2021; Lawler et al., 2021; Owen et al., 2018).

3.4 Quantitative and Qualitative Measures

3.4.1 Accelerometry

Physical activity levels were assessed using the Actigraph GT3X accelerometer (ActiGraph, LLC, Fort Walton Beach, FL). This is a small electronic device that measures both the frequency and intensity of movement and was worn on the wrist. Pre-filtered data is collected by this accelerometer at a rate of 30 measurements per second (30 Hz). The data is then post-filtered into 60 second epochs used to record physical activity and then converted into a metabolic equivalent of task (MET). Sixty second epochs have been advised to capture the physical activity patterns of youth (Reilly et al., 2006). The Actigraph accelerometer has been shown to provide a valid indication of the energy expenditure and activity levels of adolescents (Treuth et al., 2004; Jussila et al., 2022; Trost et al., 2011).

3.4.2 The Body Appreciation Scale (BAS-2)

Positive body image was measured using the most recent version of the Body Appreciation Scale, the BAS-2 (See Appendix A). Body appreciation as measured by the BAS-2 has been shown to be one of the most valid measures of positive body image (Halliwell et al., 2013; Tiggerman & McCourt, 2013; Tylka & Woodbarcalow, 2015). For example, Halliwell et

al., (2013) revealed that college women who exhibited lower levels of body appreciation placed significantly more importance on their appearance discrepancies (i.e., discrepancies in how they would like to look in comparison to how they actually looked) after being exposed to images of thin female models. In comparison, women who exhibited high levels of body appreciation directed less of their attention to appearance-based discrepancies. The BAS-2 consists of 10 statements that represent having a positive attitude towards the body, for example, "I take a positive attitude towards my body." Participants were required to rate their agreement with each statement on a response scale with responses ranging from never = 1, seldom = 2, sometimes = 3, often = 4, always = 5. An average of the participants' scores to the ten items was then computed and used as an indicator of having a positive body image (See Appendix A).

Body appreciation was also assessed using semi-structured interviews which consisted of eight open-ended questions designed to assess the relationship between physical activity participation and body appreciation in adolescent girls (See Appendix B).

3.5 Procedure

Before the data collection began, ethical approval was received from the Interdisciplinary Committee on Ethics in Human Research (ICEHR) Board at Memorial University of NL. Purposive sampling was then used in the present research as this method of sampling has been used extensively in mixed methods research to gain access to a sample that have characteristics that are conducive to the research purpose (Campbell et al., 2020; Palinkas et al., 2015). This helps to augment the rigour of the study and ensure integrity of the data and results (Campbell et al., 2020). As such, a local track and field coach as well a physical education teacher at a local school were contacted by email to obtain access to the potential participants who made up the sample for the study. In this email, the coach and the physical education teacher were provided

with a digital copy information sheet on the study as it related to the responsibilities of the student participants. A time was then arranged for the researcher to attend various junior high and high school physical education classes in addition to an organized track and field practice at the Field House at Memorial University of NL. During this time, the researcher discussed the general purpose and significance of the study with the girls and invited them to participate.

Girls who were interested in participating in the study were then given hard copy information packages. These packages included an information sheet outlining the details of the study, an informed consent form, and a copy of the Body Appreciation Scale (BAS-2). They were then informed about the principles of ethical research. Specifically, they were informed that any information that they provided was confidential and anonymous. They were also assured that they could withdraw from the study at any time if they desired without any consequences. Next, they were instructed to review and complete the forms with their parent or guardian and return the signed forms to the researcher at their next physical education class or practice session if they wanted to participate. Once the forms were returned to the researcher and both adolescent and parental consent were obtained, the accelerometers were programmed to begin recording physical activity data in 60-second epochs at the time of distribution. The researcher then attended another scheduled physical education class and track and field practice to distribute the accelerometers. At the time of distribution, the girls were reminded to wear the accelerometer for a minimum of ten hours per day for seven days a week, with the exception of bathing or swimming (Trost et al., 2005). Based on the findings of similar studies accessing physical activity levels in adolescents (Treuth et al., 2004; Jussila et al., 2022; Trost et al., 2011), the recorded physical activity and sedentary behavior were then categorized into the following

categories: sedentary behavior as <1.5 METS, light physical activity as 1.5-3.0 METS, MVPA as ≥ 3-METs.

After the accelerometers were returned to the researcher, semi-structured interviews were conducted with the participants. These semi-structured interviews were conducted at a local school and university and consisted of eight open-ended questions designed to assess the positive influence that physical activity participation has on body appreciation in adolescent girls (See Appendix B). For example, "Does participating in different types or intensities of physical activity influence the appreciation you feel towards your body?" The interviews took approximately fifteen minutes to complete and were audio recorded using a hand recorder. Although some questions were sensitive in nature, participants were only required to answer questions that they felt comfortable answering and could withdraw themselves from the interview at any point in time.

3.6 Quantitative Data Treatment and Analysis

Raw data from the accelerometers were downloaded and analyzed using ActiLife software (Actigraph LLC) for subsequent data reduction. All other subsequent data analyses were performed using IBM SPSS (Version 29.0.1.1) for Mac (IBM Corp, 2022). Descriptive statistics were computed for both the BAS-2 as well as average minutes of physical activity per day at various intensities, i.e., sedentary, light, and MVPA. A bivariate correlation was conducted to examine relationships between physical activity intensity and body appreciation. A body appreciation score was given for each participant by summing the scores of all ten items on the body appreciation scale (BAS-2).

3.7 Qualitative Data Treatment and Analysis

3.7.1 Transcription

Each interview was transcribed verbatim using Otter AI online transcription software (Otter.ai - AI Meeting Note Taker & Real-time AI Transcription, n.d). Each recording was then listened to multiple times to ensure data accuracy and integrity.

3.7.2 Reflexive Thematic Analysis

Thematic analysis is a broad term which encompasses a variety of approaches for analysing qualitative data that vary in philosophy and procedure rather than a single analytical approach to qualitative research (Braun et al., 2019). In a general sense, thematic analysis entails uncovering patterns of themes that emerge as important from the perspectives of multiple participants. In the present research, I used Reflexive Thematic Analysis (RTA) which is frequently used in psychological research to analyze interview data.

In RTA, the researcher generates themes in the data that encompass the shared perspectives and experiences of multiple participants that relate to a topic of interest (Braun & Clarke, 2006; Braun & Clarke, 2019). Additionally, RTA is a subjective process and thus, to generate appropriate themes, researchers need to be both reflexive and transparent (Braun & Clarke, 2019). Olmos-Vega et al., (2022) define reflexivity as "a set of continuous, collaborative, and multifaceted practices through which researchers self-consciously critique, appraise, and evaluate how their subjectivity and context influence the research processes."

3.7.3 Rationale for Using RTA

RTA was the most fitting approach to data analysis for the present research for several reasons. It is considered one of the simplest and most efficient methods to use as it entails fewer procedures in comparison to more complex qualitative analysis methods (e.g., discourse

analysis). RTA also allows for a more rich and detailed exploration of a topic of interest in comparison to other coding methods, such as codebook thematic analysis (Braun & Clarke, 2019). Additionally, RTA encompasses a more flexible process as researchers can consistently reflect on the themes that are generated as the analysis progresses. This allows researchers to modify and redefine the themes that are generated to more accurately depict participants' understandings of the phenomenon being explored (Braun & Clarke, 2019). Considering that the goal of this project was to gain a rich understanding of the perspectives and experiences of participants, RTA was deemed to be the most appropriate methodology**.**

3.7.4 Inductive Approach

An inductive or exploratory approach was used to analyze the data as significant themes in the data were used to generate research findings (Thomas, 2003). Explicitly, codes were derived organically to represent the content of the data and no preconceived code book was used prior to data analysis to outline where certain codes should fit. I considered an inductive approach to be the most appropriate for this research as I did not use any pre-existing theories to guide my analysis of the data as the goal of the present research was to illuminate the experiences of participants in their own words.

Although an inductive approach was used to analyze the data, there is no way to guarantee that my analysis of the data was not shaped in accordance with my own experiences and perspective on the research. For example, since I conducted a literature review prior to engaging in data analysis, it is possible that some theories that I researched on the topic may have shaped my perspective and understanding of the data and thus the themes and codes that I generated. In order to acknowledge this, after each interview was completed field notes were taken to document the influence that interpersonal and power dynamics as well as contextual

factors may have had on participants' responses. For example, I considered how my experiences as a varsity athlete and educated female may have shaped the responses of participants (Olmos-Vega, 2022).

3.8 Data Analysis

Data from the semi-structured interviews were analyzed using Braun and Clarke's six step approach to Reflexive Thematic Analysis (Byrne, 2022).

1.Data Familiarization and Writing Familiarization Notes

As recommended by Braun & Clarke (2013), each transcript was read and re-read multiple times to familiarize myself with the data and adopt a critical view of the data. During this stage, I also wrote down my initial thoughts and emotions with regards to the data and identified patterns in the subject matter which could eventually evolve into themes and codes.

2. Systematic Data Coding

De Santis and Ugarriza, (2000) define a code as a word or phrase used to name a piece of data that depicts the main concept of that data and how it relates to the research question. The data was coded using a data driven "bottom up" method as the codes were generated from the data set itself without taking into consideration the existing literature. The data was coded by hand as I highlighted key words and phrases in different colours that corresponded to a specific theme. This was a recursive process as I returned to the data set and revised the codes multiple times. When data extracts related to multiple different topics, a variety of codes were used.

3. Generating Initial Themes from the Coded and Collated Data

As described by Braun & Clarke, (2013), a theme consists of multiple different codes that all relate to a primary concept. As such, codes (and their corresponding data extracts) that encompassed similar ideas or concepts were grouped together to produce an initial theme. This

involved a trial-and-error process as some initial themes were recoded into subthemes. Furthermore, codes that did not fit a particular theme or appeared irrelevant to the research question were combined and assigned to an "other" theme category in the instance that they became relevant in future analysis.

Reflexivity was taken into consideration during this phase as it was important to identify and acknowledge how my own preconceived ideas and assumptions may have influenced the way I interpreted the data. For example, the initial theme "Intense Physical Activity Promotes Body Appreciation" only included codes and data extracts that related to the positive influence that participation in more intense physical activity has on body appreciation. This echoed my own experiences as a varsity athlete and belief that participation in intense physical activity is critical for fostering body appreciation. Upon reflection, however, I realized that participation in light physical activity is also beneficial for promoting body appreciation in adolescent girls.

4. Developing and Reviewing Themes

After the transcription was complete, I reviewed the themes to ensure that they appropriately matched the corresponding extracts of data. As a result, some initial themes were re-articulated and some were merged together to ensure that each theme was distinct from each other while still acknowledging the research question.

5. Refining, Defining and Naming Themes

After the themes were identified, I generated a definition for each theme to clearly outline the themes' core concept. I then reviewed theme names to ensure that they were informative and aligned with the meaning of the data. It is important to note that Braun and Clarke (2006) recommend that the researcher use a recursive or iterative approach when analyzing the data which involves moving back and forth between the different stages outlined above. As such, as I

conducted my analysis, I remained aware that I needed to discern when to move between each stage of analysis (Braun & Clarke, 2019). Additionally, I remained aware of the fact that my interpretations of the data were grounded in my own experiences and reflected just one version of "reality." Other researchers may reach different interpretations that align with their own experiences and perspectives.

6. Writing the Report

As described by Braun & Clarke (2021), writing is incorporated into the process of data analysis to refine the data. I attempted to tell an illustrative analytic "story" by combining the analysis with related literature to ensure that the narrative made a definitive argument in accordance with the research question and was not solely a description of the data.

Chapter 4 - Results

4.0 Quantitative Results

Descriptive statistics were computed for physical activity intensity and body appreciation (Appendix C). The sample was comprised of 13 girls in early adolescence (M=14.07, SD=1.54) who reported high levels of body appreciation (M=41.92, SD= 5.63). However, the physical activity data for 3 girls could not be included in the study as they did not wear the accelerometer for the required length of time. The average minutes for sedentary behavior were 343. Physical activity minutes overall were high, with participants accumulating an average of 463 minutes of light physical activity and approximately 83 minutes of MVPA per day.

A bivariate correlation was conducted to explore the relationship between physical activity and body appreciation in adolescent girls. However, no significant correlations were noted. Specifically, the relationship between sedentary behavior and body appreciation was r (9) =.18, p=.59; the relationship between light physical activity and body appreciation was

r (9) = -.09, p=.79; the relationship between MVPA and body appreciation was r (9) = .39, p = .23. Lastly, the relationship between step counts and body appreciation was r (9) = .097, p=.78.

4.1 Qualitative Results

Through the thematic analysis process, four themes were identified that were apparent in the interview transcripts. These themes were pivotal in illuminating the perspectives of all participants on the relationship between participation in different types and intensities of physical activity and body appreciation. These themes have been labelled as "Types of Physical Activity and Body Appreciation", "Intense Physical Activity Promotes Body Appreciation," "Social Support and Body Appreciation", and "Positive Coach-Athlete Relationships."

Theme 1: Types of Physical Activity and Body Appreciation

This theme was defined by the participants' understanding that participation in a variety of physical activities helps them gain higher levels of body appreciation by augmenting their appreciation of the functionality of their bodies (i.e., what their bodies can achieve as opposed to their physical appearance. However, nothing conclusive can be drawn here as the participants in the study also reported having high levels of social support and positive relationships with their coaches which may have interacted with the relationship between physical activity and body appreciation. The positive influence that participation in various types of physical activity has on the body appreciation of girls is evidenced in the transcript.

> I: Does participation in Track and Field influence the appreciation you have for your body?
>
> P1: "Like I think it makes me feel happy with what I can do with my body. Like I'm not thinking about what my body looks like but I'm thinking about what I can do with it."

I: Does being able to perform certain skills in dance help you gain an appreciation for your body?

P2: “Yeah, because not very many people can do that which is pretty cool. But when you do it, it’s cool because other people are like wowed by it.”

Interestingly, the protective influence that physical activity participation has on the body appreciation of adolescent girls was particularly pronounced among girls who participated in certain physical activities, such as hockey and soccer as they felt like their body deviated from idealized body types in society, such as the thin ideal. For example, two girls admitted that, although it can be hard at times, the rigor of their training and their success in their sport helped offset the insecurities they had in their bodies by helping them to attain an appreciation for what their bodies could achieve as opposed to their physical appearance.

I: Does participating in hockey help you to gain an appreciation for your body?

P3: “I think most girls who play sports like hockey will probably tell you the same thing. We're not built like most other girls are because of all the training that we do. So it can be hard, but you also have to appreciate, like, you've worked hard for this. And so like, it's not something you just take for granted.”

Another junior high soccer player discussed how playing soccer helps her appreciate her body by preventing her from focusing on the insecurities she has in her body.

I: Does participating in soccer help you to gain an appreciation for your body?

P4: “Yeah, when I'm like playing soccer, I don't really think about, like, the insecurities I have in my body. But when I’m stretching, it's like I’m kind of left alone with those thoughts. Yeah, more unpleasant.”

Overall, it is evident that participation in different types of sports can help adolescent girls cultivate an appreciation of what their bodies can do as opposed to their physical appearance. This is particularly true among girls who participate in sports such as hockey and soccer, who often feel like their bodies deviate from body type ideals that are glorified in society, such as the "thin ideal." This is often due to the muscularity and skill sets that are required for successful performance in their sport.

Theme 2: Intense Physical Activity Promotes Body Appreciation

The second core theme was physical activity intensity. Specifically, there was a consensus among participants that participation in higher intensity physical activity, such as organized sports, was more effective in helping them attain body appreciation compared to participation in less intense physical activities, such as walking. This was influenced by the sense of achievement and physical self-efficacy that girls achieved by participating in more intense physical activities.

> I: "Does participating in intense physical activity, such as soccer increase the appreciation you feel towards your body more than participating in light physical activity?
>
> P5: "Yeah. Like if I was playing House League, I think I would probably drop out in U 15 or something and focus on school but since I'm playing the higher level like AAA hockey, I know than I can stay with it."
>
> P6: "I like hiking a lot more because I feel like I'm reaching like, a certain goal. Like you're gonna get to the top and you get to eat and the views are so good. And it's just like, it's a lot more and I feel like I'm doing more physical activity than I am walking."

P4: “Yeah it's like, I feel pretty good. It's like seeing I can accomplish some like skills that I didn’t know I could do so that's nice. It’s like achievement.”

P7: “Intense physical activity is a challenge. I get to push myself and I like that.

Interestingly, the belief that participation in lighter intensity physical activity was associated with laziness was also prevalent among girls involved in high intensity, competitive sports. This may stem from the messaging they are receiving from the media or from parents, peers, coaches and other influential people in their lives.

I: “Why do you prefer to participate in high intensity physical activities as opposed to low intensity physical activities?

P5: “Yeah, I think a lot, it improves like everything, your health, like everything to do with that. If I didn't do these like high active sports, I feel like I'd be pretty lazy and I wouldn't have as much potential as I do today.”

P8: “It’s like having like a sense of like, oh, I'm doing physical activity. It's like, I can feel so much better about myself after because I know I'm doing something. If I’m doing nothing, then I'm just gonna be like, oh, I'm so lazy. Like, I don't feel good about myself.”

Although all the girls in the study believed that participating in higher intensity physical activity was more beneficial in helping them gain higher levels of body appreciation, some of them still enjoyed participating in light physical activity. This was grounded in the fact that participating in light physical activity was beneficial for promoting positive mental health, such as the ability to relieve stress.

I: “What is your favorite part of participating in light physical activity?”

P9: “Well, it's just like, it's like a calming thing for me, personally, because you just get to like pedal and you don't think, it’s just free of mind. You just don't really think about what's happening.”

P8: “I just like being active. It could be anything, going for a walk, walking my dog, anything and it just changes like the whole mood of my day which makes me feel a lot better.”

In summary, for these participants, when it comes to physical activity intensity and body appreciation, participating in intense physical activity seemed to be more effective in helping girls cultivate body appreciation as it helps them gain a sense of accomplishment and physical self-efficacy. However, some girls also believe that participation in light physical activity served as an act of self-care primarily by relieving stress which demonstrates body appreciation (Cook-Cottone, 2015).

Theme 3: Social Support and Body Appreciation

All the girls in the present study described the physical activity environments that they engaged in as being positive. Receiving high levels of social support and having positive and supportive relationships with their coaches were frequently discussed in the interviews. When the girls were asked what their favorite aspect of participating in physical activity was, forming friendships, experiencing camaraderie with peers and working together towards shared goals was frequently discussed.

I: “What is your favorite part of participating in physical activity?

P5: “Well, over the years I've gotten really good friendships and relationships with the people I play with. So getting to play like soccer, and then I have this friend in Corner

Brook who I played with last year, so even like long distance friendships can be created through sports."

P10: "I like the community at track and all the friends I have made at track. And I like how it makes me feel after and I just like the activity itself a lot. I like to run a lot."

P11: "I like performing as a group with my friends, because everybody kind of helps each other. Like you can't really perform without them unless if you're doing a solo but it's more fun to watch a group because they work together to get stuff done."

P8: "The different types of bodies are very much like celebrated. Like in the past, cheer has always been like you need to have the perfect body for it. But now I find like it doesn't really matter like what your body type is you can still do cheer and no one like, bullies anyone for what they look like or anything so I find that it's very body positive."

Overall, receiving social support and building meaningful friendships with teammates promotes body appreciation by creating a positive and supportive physical activity environment.

Theme 4: Positive Coach-Athlete Relationships

Participants also frequently discussed having positive and supportive relationships with coaches. When they were asked to describe the relationship they had with their coach, it was described as having an open communication style and trust.

P9: "Like when the coach tells you you've done something good, it's like reinforcing. It's just like a huge compliment, like it ups your confidence about the sport."

P11: "I love all my teachers but like they help me. Like if I do something wrong, they would like always help me get it right or make me more confident and say that if you're perfect there's no point of being here because you're in class to get better at stuff. And

they help you understand that you can't really get frustrated at that because you're there to learn."

P8: "If anyone were like to not like their body, it's like something that like the coaches will talk about like they will talk to them about it. So I find it's like, it's good."

These results suggest that the relationship between participating in different types and intensities of physical activities and body appreciation in adolescent girls may be contingent on the overall sport environment, namely, social support and positive coach-athlete relationships.

Chapter 5 – Discussion

5.0 Type of Physical Activity and Body Appreciation

The qualitative findings for this study revealed that participation in various types of physical activity enhanced the body appreciation of adolescent girls by helping them gain an appreciation for what their bodies can accomplish as opposed to their physical appearance. These findings are consistent with recent literature that explored the relationship between participation in different types of sports and body image in adolescents and adults (Marschin & Herbert, 2021; Jankauskiene et al., 2020; Riddervold et al., 2023).

Notably, a cross-sectional study by Marschin & Herbert (2021) investigated whether the type of exercise that adults (ages 18-64) engaged in on a regular basis could influence their body image and if physical self-efficacy served as a psychological mediator of this relationship. The results of the study revealed that individuals who engaged in exercise at least once a week had lower levels of body dissatisfaction and this relationship held true for individuals involved in yoga, ball room dance, individual and team sports.

Additionally, Jankauskiene et al., (2020) explored the relationship between positive body image and disordered eating in a large sample of adolescent boys and girls who engaged in

different types and levels of sports. The findings of the study revealed that adolescents who participated in both leisure and competitive sports reported significantly higher levels of body appreciation in comparison to adolescents who did not participate in sports. Similarly, Riddervold et al., (2023) investigated the relationship between physical activity participation, life satisfaction and body appreciation in a sample of Norwegian adolescent boys and girls between 16 and 19 years old. The results of the study revealed that adolescent boys and girls who participated in organized leisure sports reported greater body appreciation than their non-active peers. This finding may be grounded in Menzel and Levine's (2011) model of positive body image development which suggests that participation in physical activities may promote positive embodiment. For example, competitive sports may play a role in the development of a positive body image by promoting less self-objectification, namely, having a more internally focused view of the body compared to external monitoring. However, the findings of the study also revealed that this relationship was contingent on whether the sport environment was positive. This finding is consistent with the results of the present study as all the girls discussed the sports environments that they engaged in as being positive, characterized by positive coach athlete relationships and high levels of social support. This finding suggests that participation in all types of physical activity including both competitive and non-competitive sports may promote body appreciation in adolescent girls if the overall physical activity environment is positive.

Overall, the findings from Jankauskiene et al., (2020) and Riddervold et al., (2023) suggest that in order to promote body appreciation among adolescent boys and girls, coaches must ensure that athletes and their support networks receive the resources and education necessary to actively reject societal beauty ideals by ensuring that athletes understand the

importance of nourishing the body, its wellness and health and appreciate the functions it performs as opposed to its physical appearance (Riddervold et al., 2023).

In contrast to the results of their research, other studies have reported that the relationship between physical activity participation and body appreciation is influenced by type of sport. Notably, a recent systematic review by Gualdi-Russo & Zaccagni (2023) investigated the relationship between body image satisfaction and dissatisfaction in a sample of adult and adolescent athletes participating in different types of sports at various levels. The results of the review indicated that the relationship between sports participation and body image dissatisfaction (BID) was moderated by the type of sport. Specifically, the findings of their study revealed that ballet dancers expressed higher levels of body dissatisfaction, grounded in their drive to be thin and their perception of being overweight (Zaccagni & Gualdi-Russo, 2023). This was particularly pronounced among female dancers in comparison to male dancers. Jankauskiene et al, (2020) found that adolescents involved in both competitive and leisure sports reported greater internalisation of sociocultural ideals towards appearance compared to non-exercisers. These results may be explained by the Tripartite Influence Model of Thompson (1999) which states that adolescents involved in sport may be more susceptible to internalize beauty ideals as a result of pressures from parents, peers, media and coaches to maintain a certain appearance in order to augment their performance. Consequently, adolescents involved in both competitive and leisure sport may experience more pressure to conform to beauty ideals and to maintain a particular body weight and/or shape than adolescents not involved in sports. The results of this literature deviate from the results of the present study. This could be attributed to the fact that all the girls in the study discussed the physical activity environments that they engaged in as being positive, marked by social support and positive coach-athlete relationships. This suggests that positive

physical activity environments are critical in fostering body appreciation among adolescent girls engaged in all types of sports.

Recently, Baceviciene et al., (2023) compared the prevalence of disordered eating (DE), body image and sociocultural pressures of both adolescent and adult athletes participating in both aesthetic weight sensitive (WS) sports compared to those participating in less weight sensitive sports. The results of the study revealed that disordered eating, overweight preoccupation, and body-image related pressure from coaches was more prominent in weight sensitive sports. Eck & Byrd-Bredbenner (2022) also revealed that athletes in aesthetic (e.g., cheerleading, figure skating), leaness (e.g., cross country running, track and field and swimming) and power sports (e.g., power lifting) were more vulnerable to developing disordered eating behaviors, increasing their risk for the development of eating disorders.

Overall, the results from the present research in addition to the findings of other studies, suggest that participation in multiple types of physical activity (i.e., team sports, individual sports, leisure and competitive sports) can promote body appreciation in adolescent boys and girls. However, this relationship is heavily contingent on the sport environment. Specifically, in order to promote body appreciation among adolescents involved in different types and levels of physical activity, coaches, parents and other members of physical activity environments must provide athletes with the resources and education necessary to actively resist thin or strong athletic body idealisation in society. Critically, emphasis should be placed on body functionality by helping adolescent boys and girls gain an appreciation for what their bodies can achieve as opposed to what their bodies look like.

5.1 Physical Activity Intensity and Body Appreciation

No significant relationships were found between physical activity, sedentary behaviour and body appreciation among adolescent girls. This was likely due to a lack of statistical power as a result of the limited sample size used in the study (Columb et al., 2016). However, the qualitative findings showed that participation in MVPA may play a role in attaining higher levels of body appreciation. These findings are strengthened by the quantitative data, which objectively measured physical activity levels. Specifically, the physical activity data revealed that all the girls in the study surpassed the Canadian physical activity guidelines outlined by ParticipACTION (2022) which recommend that adolescents participate in at least 60 minutes of MVPA per day. Specifically, participants engaged in an average of 83 minutes of MVPA per day. The girls in the study also reported high levels of body appreciation on the BAS-2. The interview data helped to contextualize this finding by showing that the body appreciation the girls derived from participation in MVPA seemed to be grounded in physical self-concept and a sense of accomplishment. These results were consistent with a recent systematic review by Gualdi-Russo et al., (2022) who reported a lower prevalence of body image disorders and a better body perception in adolescents who engaged in MVPA over the span of one week. Similarly, Garn et al., (2020) revealed that participation in MVPA, mainly during the school day, could augment physical self-concept (i.e., the way one defines and evaluates himself or herself physically, including physical attractiveness, physical condition, physical strength or sport competence) in 12-year-old adolescents. Therefore, from a health promotion standpoint it is pivotal that schools provide numerous opportunities for adolescents to be physically active. Implementation of daily physical education classes, daily recess breaks, and classroom physical

activity breaks are examples of how adolescents can be more active in schools (Gam et al., (2020).

In contrast, Allen et al., (2019) found no significant difference in participation in MVPA and functional body image (i.e., an individual's perception of their body's 'functional' capabilities, including how the body moves and how biological systems function) in adolescent girls ages 9-12 years. Specifically, the findings of the study revealed that while participation in MVPA was related to a more positive behavioral functional body image in boys, this relationship did not hold true for girls. In fact, the findings of this study revealed that girls who participated in higher levels of MVPA experienced a lower behavioral functional body image, specifically, they dedicated less time to maintaining aspects of their body, such as regularly engaging in physical activity. This was suggested to be attributed to the fact that as girls increase their engagement in higher intensity physical activity, they may develop higher aspirations for how their body functions and performs physically. Therefore, when it comes to physical activity intensity and positive body image, it is critical that girls self-reflect on their emotional experiences, such as stress relief to shift their focus away from external pressures to conform to specific body type ideals.

5.2 Physical Activity Participation and the Developmental Theory of Embodiment

While the quantitative results did not show a significant correlation between physical activity intensity and body appreciation in adolescent girls, the participants' narratives in the study reflected that participation in both light and MVPA, such as competitive athletics helped girls attain high levels of body appreciation. For example, when asked if participation in physical activity influenced their body appreciation, one girl responded, "Being able to endure all of the like cardio which is stopping and starting over and over again. It's like, a good thing because it

makes my legs feel strong." Another girl responded, "I normally feel pretty good. It's just like, sometimes there's things when, like, I see someone who is like, taller or stronger than me, I'll feel a bit inferior. I'll be like, oh, I wish I was more like that. It's just our bodies. We are born with a certain body for a reason." These results support the Developmental Theory of Embodiment which suggests that participation in physical activity can promote a sense of positive embodiment among individuals described as feelings of comfort and connection with the body, engagement in attuned self-care and spirtuality (Piran, 2016). These results also echo the findings of Menzel and Levine (2011) which revealed how specific mental skills, required for successful sports performance such as stamina, strength and coordination help athletes adopt an internally focused view of their body by enhancing their body awareness in addition to helping them cultivate a sense of physical empowerment and competence.

5.3 Sport Environment and Positive Body Image

5.3.1 Social Support

The results of the BAS-2 in addition to the interview data revealed that participation in various types of physical activities, namely, soccer, hockey, hiking, dance and cheerleading helped girls cultivate body appreciation. Notably, however, all the girls in the present study described the physical activity environments that they engaged in as being positive. Receiving high levels of social support and having positive and supportive relationships with their coaches were some of the most prominent themes that emerged from the interview data.

These findings are consistent with numerous other studies that illuminate the positive influence of social support on body appreciation in women and adolescent girls (Marta-Simoes et al., 2021; Pinto et al., 2017; Wood-Barcalow et al., 2010). For example, Pinto et al., (2017) explored the role of body appreciation as a mediator in the relationship between social safeness

and disordered eating in women aged 18 to 50 years old. The results of the study revealed that women who had higher levels of social safeness (i.e., feelings of social acceptance and connectedness) expressed a more positive and respectful attitude towards their body and a decreased incidence of disordered eating behaviors. This was attributed to the fact that women who experience higher levels of social safeness are more willing to express a more positive and respectful attitude towards body image, irrespective of its appearance.

Wood-Barcalow et al., (2010) reiterated the protective influence that close emotional ties and meaningful social connections has on the body appreciation of college aged women.

5.3.2 Coach-Athlete Relationship

The girls in the study also described the importance of having a positive relationship with their coach marked by a supportive and open communication style. This also suggests the role that coaches play in creating body positive environments. These findings mirror those of other studies that examined the influence of the coach-athlete relationship on body appreciation in collage age women and adolescent girls (Boudreault et al., 2022; Eadie et al., 2023; Deogracias-Schleich et al., 2022; Schneider et al., 2023). Notably, Schneider et al., (2023) explored the perspective that coaches had on girls' body image in different sport environments, in addition to their preferences for effective body image interventions. The coaches identified several strategies that can be used to address body image concerns in their athletes in an effective and sensitive manner. These strategies included encouraging open and non-judgemental communication with athletes, building trust with their athletes, and having diverse and representative female mentors in their sport.

Deogracias-Schleich et al., (2022) reiterated the influence of the coach-athlete relationship on the body image of adolescent athletes. The study examined the effect that

sociocultural influences, such as social support and the coach-athlete relationship had on the body image perception of adolescent female athletes (ages 14-16) engaged in both individual and team sports. The results of the study revealed that female athletes who reported having a positive relationship with their coach were less likely to experience body dissatisfaction. For example, many individual sport athletes described their coaches as generally supportive when they did not place pressure on them to look a certain way or control their appearance.

Boudreault et al., (2022) also highlighted the critical role that the coach-athlete relationship has on the body image of adolescent athletes. The main aim of this study was to determine if there was a relationship between sociocultural factors, such as weight related maltreatment from coaches and parents (i.e., encouraging athletes to maintain a below-average weight, placing importance on body weight and appearance or suggesting that athletes lose weight) and the adoption of weight control behaviors. The sample of the study included French-Canadian male and female adolescent athletes (ages 14-17) competing in various types and levels of organized sports. The results revealed that adolescent athletes who experienced weight related coach maltreatment were at a higher risk for the development of health compromising weight control behaviors, such as frequently weighing themselves or reducing their meal proportions.

Overall, when it comes to participation in different types and intensities of physical activity in adolescents and body appreciation, the environment including social support and coach-athlete relationships characterized by a supportive and open communication are paramount in fostering body appreciation in adolescent girls. As such, sport programs need to be intentionally developed so that parents and coaches gain the knowledge and insight necessary to create environments that promote fun, competence, instrumentality, and a positive view of one's body.

5.4 Body Appreciation and the Critical Realist Perspective

The findings of the current research support The Critical Realist Perspective as an important perspective in guiding the methodology and interpreting the results. The findings showed that girls who participated in various types and intensities of physical activity had higher levels of body appreciation. Notably, however, all the girls in the study also described the physical activity environments that they engaged in as being positive where they received high levels of social support and had positive coach-athlete relationships. These findings support the Critical Realist Perspective by emphasizing the fluidity and contextual nature of body appreciation. Specifically, girls' experiences of body appreciation in physical activity contexts such as competitive sports may vary as a function of their individual experiences and the overall social context in which they participate in physical activity. In this regard, the findings of the current research cannot be extrapolated to the experiences of other girls involved in physical activity.

5.5 Implications

Koulanova et al., (2021) outlined several strategies that can be used to help adolescent girls cultivate a positive body image in physical activity settings, notably, uniform specialization, body talk and body positive role modelling. With regards to uniform specialization, it is pivotal that girls have access to sport attire that they feel comfortable and confident wearing and that accommodates a diverse range of body types. Authority figures in sport and physical activity settings, such as parents, teachers and coaches also need to create safe and compassionate physical activity spaces for adolescent girls by ensuring that clear policies and guidelines exist that promote inclusion, body diversity and encourage everyone to look out for the mental and physical health of others. It is also critical that adolescent girls are exposed to body positive role

models. As such, coaches, parents, and other prominent members of the support networks of adolescent girls must act as a role model themselves, facilitate mentorship opportunities for adolescent athletes, and ensure that adolescent girls are exposed to body positive messaging. This can be achieved by placing emphasis on body diversity and skill set rather than appearance (Koulanova et al., (2021).

The current research has important implications for the school system, health care providers and coaches. For example, it will help coaches and physical educators design safe and compassionate physical activity spaces for adolescent girls to participate in physical activity. Additionally, it will help clinicians, researchers and other health providers design more effective interventions to promote a positive body image as opposed to alleviating a negative body image. The findings of the current research will also help clinicians and physical educators understand the protective role that physical activity engagement can have in helping girls attain a positive body image and an appreciation for their bodies, irrespective of their physical appearance. Future research in the area should explore the relationship between physical activity intensity and body appreciation in girls who are not athletes. This will help elucidate the relationship between physical activity participation and body appreciation as it is likely that the physical activity levels for this population likely look different than the athletic population.

5.6 Limitations

No significant relationships were found between physical activity, sedentary behaviour and body appreciation among adolescent girls. This was likely due to a lack of statistical power as a result of the limited sample size used in the study (Columb et al., 2016). As such, the results of the study may not be generalizable to the population of adolescent athletes at large. However, the qualitative data helps to compensate for this limitation by highlighting the individual

perspectives of participants. In this regard, both the qualitative and quantitative data sets should be examined separately to reveal the true version of events (Moffatt et al., 2006).

There were also limitations associated with the use of accelerometers to measure the physical activity levels of adolescent girls because accelerometers cannot record some specific physical activities, such as skating and swimming (Harrison et al.,2017). Therefore, the physical activity levels of girls in the study who participated in these sports could not be quantified and analyzed. There was also no way to ensure that the intensity of physical activity that the girls participated in were accurately captured as there is no way to ensure that the girls adhered to the guidelines of the study and wore the accelerometer for 12 hours a day. A selection bias may also have impacted the results of the study as parents and guardians who provided their consent to allow their daughters to participate in the study may value participation in physical activity themselves.

Chapter 6 - Conclusion

In this thesis, I have provided an overview of a research study that explored the relationship between physical activity intensity and body appreciation in adolescent girls. Overall, it seems that participation in higher intensity physical activities, namely, competitive sports in addition to lower intensity physical activities can help adolescent girls cultivate higher levels of body appreciation. This is grounded in the sense of achievement, socialization and confidence that girls obtain from participation in physical activity. Notably, however, the protective role that participation in light and vigorous physical activity has on the body appreciation of adolescent girls is dependent on whether the overall physical activity environment is positive. In this regard, it is highly recommended that girls receive high levels of social support from their peers and teammates, have a positive relationship with their coach

marked by mutual trust and open communication, and are exposed to body positive messaging that help them to challenge and actively resist harmful societal messaging. This will help girls gain an appreciation for the functionality of their bodies as opposed to their appearance and help them navigate any body image concerns that they may experience during the transition into adolescence. From a health promotion standpoint, the findings of this research help elucidate the important role that physical activity engagement in accordance with the Canadian 24-hour Movement Guidelines has on promoting a positive body image in adolescent girls. Additionally, these findings will help researchers and clinicians understand the importance of designing interventions targeted towards helping girls attain a positive body image as opposed to alleviating a negative body image.

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Appendix A

The Body Appreciation Scale-2

1. I respect my body.
2. I feel good about my body.
3. I feel that my body has at least some good qualities.
4. I take a positive attitude towards my body.
5. I am attentive to my body's needs.
6. I feel love for my body.
7. I appreciate the different and unique characteristics of my body.
8. My behavior reveals my positive attitude toward my body; for example, I hold my head high and smile.
9. I am comfortable in my body.
10. I feel like I am beautiful even if I am different from media images of attractive people (e.g., models, actresses/actors).

Appendix B

Interview Guide

1. Can you tell me about what physical activity means to you?
    a. How often would you say you participate in regular physical activity?
    b. What types of physical activities do you typically participate in?
    c. How many days a week do you participate in physical activity?
    d. What do you enjoy about physical activity?
    e. Why did you start and what are some of the reasons you participate in physical activity?
2. Can you elaborate on the types of activities you participate in and why?
    a. Is there one particular activity you prefer most and why?
3. When you exercise, are you more interested in participating in light physical activity (e.g., yoga, cleaning your bedroom), moderate physical activity (e.g., brisk walking) or vigorous physical activity (e.g., running)? Why?
4. What do you enjoy most about physical activity? What do you enjoy least about physical activity?
5. Describe the aspects of your body that you appreciate most and why? Describe the aspects of your body that you appreciate least and why?
6. Discuss the ways by which you take care of your body?
7. How do you feel about your body when you are participating in physical activity? Does participating in physical activity influence the appreciation you feel towards your body?
8. Does participating in different types or intensities of physical activity influence the appreciation you feel towards your body? How?

Appendix C

Table 1

Descriptive Statistics for physical activity intensity and body appreciation in adolescent girls

	N	Minimum	Maximum	Mean	Std. Deviation
Age (years)	14	12	17	14.07	1.542
BAS (0 – 50)	12	34	50	41.92	5.632
BAS Q1 (0 – 5)	12	4	5	4.83	.389
BAS Q2 (0 – 5)	12	3	5	4.17	.718
BAS Q3 (0 – 5)	12	4	5	4.83	.389
BAS Q4 (0 – 5)	12	0	5	3.92	1.505
BAS Q5 (0 – 5)	12	4	5	4.58	.515
BAS Q6 (0 – 5)	12	3	5	4.08	.793
BAS Q7 (0 – 5)	12	3	5	4.00	.853
BAS Q8 (0 – 5)	12	3	5	4.08	.793
BAS Q9 (0 – 5)	12	2	5	4.17	1.030
BAS Q10 (0-5)	12	3	5	3.83	.718
Steps Counts	11	6812	13044.86	9575.45	1819.52
Sedentary (min)	11	143.71	742.20	343.08	188.40
Light (min)	11	327.39	580.66	463.40	91.37
MVPA (min)	11	35.30	157.00	83.61	34.33
Valid N (listwise)	10				

Appendix D

Informed Consent Form

Title:	*Physical Activity and Body Appreciation in Adolscent Girls*
Researcher(s):	*Laura O'Keefe, Department of Human Kinetics and Recreation, laurakok@mun.ca, 709-765-5832.*
Supervisor(s):	*Dr. Jeff Crane,Department of Human Kinetics and Recreation, jcrane@mun.ca*

You are invited to take part in a research project entitled *"Physical Activity and Body Appreciation in Adolescent Girls."*

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact the researcher, ***Laura O'Keefe*** at laurakok@mun.ca or 709-765-5832 if you have any questions about the study or would like more information before you consent.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

Introduction:
My name is Laura O'Keefe and I am a Masters student in the Department of Human Kinetics and Recreation at Memorial University of NL. As part of my Masters research, I am conducting research under the supervision of Dr. Jeff Crane.

Purpose of Study:

This study will explore the relationship between physical activity participation and body appreciation among adolescent girls. Specifically, this study will seek to determine whether participation in specific types or intensities of PA will be more effective than others in helping adolescent girls attain higher levels of body appreciation. The results of this study will help clinicians and researchers gain a deeper understanding of the protective role that physical activity participation may have on the body appreciation of adolescent girls. This research will also help researchers and clinicians design more effective interventions to help prevent the PA decline among girls as they transition into adolescence. Please note that participation in the present research will be limited to girls born with primary female sex characteristics.

What You Will Do in this Study:

I will attend scheduled sport practices and physical education classes and will provide the girls with details on the study in person including the study's purpose. Girls will then be given an information package including an informed consent form, a copy of the Body Appreciation Scale (BAS-2) and a sociodemographic questionnaire as well as an activity log. They will then be given a period of 1 week to review and sign the informed consent form with a parent/guardian and complete the Body Appreciation scale (BAS-2) and the sociodemographic questionnaire and return the three completed forms to the researcher at their next practice if they are interested in participating in the study. The Body Appreciation Scale is a 10-item scale designed to assess the level of appreciation one exhibits towards their body. Specifically, adolescent girls will be required to rank their agreement with 12 statements regarding the level of appreciation they feel towards their body. For example, "I appreciate the different and unique characteristics of my body." The sociodemographic questionnaire will ask participants to indicate their age, gender identity, etc. If both individual and parental consent is received and the three forms are completed, the researcher will help the girls correctly put on an accelerometer at their next scheduled PE class or training session. This is a small device worn above the hip that measures the frequency, intensity and duration of movement. The girls will be instructed by the researcher to wear the device for a duration of 12 hours a day for 1 week. The information package will also include paper copies of an activity log which will require girls to record the date, type and duration of the activities they participated in for one week. This will take approximately 30 seconds to 1 minute to fill out and should be recorded after each activity they participate in. After the accelerometers are returned to the coach, I will schedule a time with participants via email to conduct an in person interview which will take place at the location (i.e, sports location or private school) where they are recruited. In the event that a participant is unable to attend an in person interview, I will arrange a time via email to conduct a virtual interview. This will require them to answer eight open-ended questions regarding the positive influence that physical activity participation has on body appreciation and will take approximately thirty minutes to complete and will be recorded using a hand recorder. It is important to note that some interview questions will ask participants how they feel about their body and as such, may be triggering. For e.g., "Does participating in different types or intensities of physical activity influence the appreciation you feel towards your body? How?" However, participants will only be required to answer questions that they feel comfortable answering and can withdraw themselves from the interview at any point in time.

Length of Time:

The total time commitment required to participate in the study will be one week. Both the BAS-2 and the socioeconomic survey will take an average of five minutes to complete and adolescent girls will be asked to wear the accelerometer and fill out an activity log for a duration of one week.

Withdrawal from the Study:

You may withdraw your participation at anytime by letting me know. If you wish to withdraw after data collection has ended you have until three days after the interview to notify me of your desire to withdraw your data. All your data will be destroyed upon your request to withdraw. However, it will not be possible to withdraw your data after this period, as I will be analyzing it for my thesis.

Possible Benefits:
Participants will gain deeper insights into their own weekly physical activity patterns including the specific types and intensities of PA they usually engage in and how this impacts the level of appreciation they have for their bodies.

The scholarly community and society will gain a deeper understanding of the protective role that participation in specific types and intensities of physical activities may have on the body image of adolescent girls.

Possible Risks:
Participation in the study may pose emotional, social and physical risks. For example, some interview questions and some items on the second edition of the Body Appreciation Scale (BAS-2) may be triggering for some participants. For example, "Does participating in different types or intensities of physical activity influence the appreciation you feel towards your body? How?" Although the data will be anonymized, participants in the same athletic training program will likely be able to identify who is and who is not participating in the study due to the group setting in addition to the fact that participants will be fitted for and wearing accelerometers. Pariticipants may also experience physical discomfort from wearing the accelerometer. However, every effort will be made to mimimize these risks and protect participants' anonymity. For example, if a partcipant becomes uncomfortable that their anonymity is being compromised they can withdraw their participation from the study. Additionally, participants are only required to answer interview questions that they feel comfortable answering and can withdraw from the interview at any time. Participants can contact various mental health support lines, such as, Kids Help Line at 709-686-868 or General (NL): Mental Health Crisis Line, 24 hour Toll Free -- 1-888-737-4668. They can also visit https://bridgethegapp.ca/youth-national/ which provides various mental health resources for youth. Additionally, every effort will be made to ensure that the accelerometers are fitted appropriately, minimizing any potential physical discomfort to participants.

Participation in the present research will be limited to girls born with primary female sex characteristics.

Confidentiality:
Although the data from this research project may be published and presented at national conferences, the accelerometer, Body Appreciation Scale (BAS-2), sociodemographic questionnaire, and activity log data will be reported in aggregate form. Interview data may be reported using direct quotes, with your permission. You will not be identified in the published results. However, it may be possible that an informed reader may be able to identify you in the published results, especially in direct quotes. Additionally, the consent forms will be stored separately from the data collected so it will not be possible to associate a name with any given set of responses. Please do not put your name or other identifying information on the Body Appreciation Scale, sociodemographic questionnaire or activity log.

Each information package will be assigned with a number by the researcher. The researcher will then give the information packages to the coach who will assign them to the participants to complete. The coach will be required to maintain a master list of each participant and their corresponding number which will

be kept anonymous from the researcher. Upon completion of the information package, the researcher will fit each participant with an accelerometer at a scheduled practice session. After wearing the accelerometer for one week, the participant will return the accelerometer to the coach who will assign their number from the information sheet to the corresponding accelerometer. The coach will then return the acclerometers to the researcher with their corresponding numbers to match the information package. The information packages will be sealed so the data will remain anonymous from both the coach and the researcher.

Anonymity:
Every reasonable effort will be made to ensure your anonymity. For example, your data will be made anonymous by assigning it an anonymized number. Additionally, you will not be identified in publications without your explicit permission.

Use, Access, Ownership, and Storage of Data:

- Hardcopy data, consent forms, audio recordings and transcriptions will be stored in a locked filing cabinet in the Human Kinetics and Recreation building at MUN. Consent forms will be stored separately from the data.
- My Supervisor, Dr. Jeff Crane and I will have access to the data.
- Data will be kept for a minimum of five years, as required by Memorial University's policy on "Integrity in Scholarly Research."

Reporting of Results:
Upon completion, my thesis/dissertation will be available at Memorial University's Queen Elizabeth II library,and can be accessed online at:
http://collections.mun.ca/cdm/search/collection/theses.

Sharing of Results with Participants:
After completion of the study, participants will be able to access a research report summarizing the main findings of the study and may request a copy of both their accelerometer and interview data by contacting the principal investigator at laurakok@mun.ca.

Questions:
You are welcome to ask questions before, during, or after your participation in this research. If you would like more information about this study, please contact: Laura O'Keefe at laurakok@mun.ca and/or Dr.Jeff Crane at jcrane@mun.ca.

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent:
Your signature on this form means that:

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.

- You understand that you are free to withdraw participation in the study without having to give a reason, and that doing so will not affect you now or in the future.
- Participants are free to withdraw from the study up until three days after the interview is complete. After this period the data will be anonymized.

By signing this form, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Your Signature Confirms:

☐ I have read what this study is about and understood the risks and benefits. I have had adequate time to think about this and had the opportunity to ask questions and my questions have been answered.

☐ I agree to participate in the research project understanding the risks and contributions of my participation, that my participation is voluntary, and that I may end my participation.

☐ A copy of this Informed Consent Form has been given to me for my records.

☐ I agree to have direct quotes from the interview published in the results.

Signature of Participant	Date
Signature of Parent/Guardian	Date

Researcher's Signature:
I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

Signature of Principal Investigator	Date