

PHYSICAL ACTIVITY MESSAGES – WHAT DO YOUTH WITH DISABILITIES THINK?

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## Abstract

There is no known research examining the use of physical activity (PA) messages to motivate youth with disabilities (YWD). The purpose of the study was to i) examine the effectiveness of PA messages on YWD's attitudes toward PA and intentions to participate in PA, and ii) consider factors related to message effectiveness. Sixty YWD were randomized to view one of three PA messages. Attitudes and intentions to were assessed at baseline and immediately post-viewing. Participants also evaluated the messages in terms of relevance, believability, attention, and attitudes. Repeated measures ANOVA indicated that attitudes and intentions did not change significantly following message viewing. The targeted message was most preferred and perceived as most believable. Attention to the message was the only significant predictor of intention post-viewing ( $p=.001$ ). Research among a sample with lower baseline attitudes and intentions would be valuable in further informing the development of effective PA messages for YWD.

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## **Literature Review**

### **Physical Activity for Children and Youth**

Encouraging physical activity (PA) for children and youth is important to aid in developing healthy lifestyle habits (Bloeman, Backx, Takken, Wittink, Mollema, & De Groot, 2014). In addition to normal daily activity, the World Health Organization (WHO) suggests that children and youth ages 5-17 get at least 60 minutes of moderate-vigorous physical activity (MVPA) per day (World Health Organization, 2017). More specifically, the most recent 24-Hour Movement Guidelines presented by Canadian Society for Exercise Physiology (CSEP) suggests that youth between the ages of 14 to 17 years aim to accumulate 60 minutes of MVPA per day that includes vigorous intensity three days a week as well as activities that strengthen muscles three days a week (CSEP, 2016). CSEP also suggests that youth limit their screen time and/or sedentary behaviour to no more than 120 minutes per day (CSEP, 2016). Data reveals that 83% of children and youth do not meet the 24-Hour Movement Guidelines (Carson, Chaput, Janssen, & Tremblay, 2017). Data from the Youth Risk Behaviour Survey (YRBS) reveals that 82% of 9<sup>th</sup> through 12<sup>th</sup> graders do not meet the recommended daily PA guidelines (Nickelson, Alfonso, McDermott, Bumpus, Bryant, & Baldwin, 2011). Further, young adults are one of the least active population demographics and there is a need to increase and promote PA for this group (Shephard, 2002). Studies have shown that declines in MVPA frequently and typically occur between the ages of 9-15 years old (Nickelson et al., 2011). Among youth, voluntary PA and participation in physical education classes decrease as well (Donato, 2006). Given that there are numerous health benefits to remaining active and following the recommended PA guidelines (CSEP, 2016), it is concerning that only a small fraction of youth achieves these physical activity guidelines.



Within Canada, approximately 4.6% of children and youth between 5-19 years of age have an identified disability (Statistics Canada, 2006). While PA rates are low for able-bodied youth, youth with disability (YWD) experience even lower levels of PA (Hills, King, & Armstrong, 2007; Rimmer & Rowland, 2008; Dodd, Taylor, & Damiano, 2002). For example, YWD have been found to be 4.5 times more likely to be physically inactive compared to able-bodied children (Steele, Kalnins, Jutai, Stevens, Bortolussi, & Biggar, 1996). YWD spend more of their leisure time in sedentary forms of activity compared to able-bodied youth (Maher, Williams, Olds, & Lane, 2007). Studies comparing daily activity between YWD and able-bodied youth have determined that YWD acquire less steps as well as spend less time in both moderate and high intensity activity (Obeid, Balemans, Noorduyn, Gorter, & Timmons, 2014; Bjornson, Belza, Kartin, et al., 2007; Capio, Sit, Abernethy, & Masters, 2012). With physical inactivity comes a myriad of health risks and YWD are more likely to be obese compared to able-bodied youth as they acquire significantly less PA (Bloeman et al., 2014). Participation rates in structured physical recreation activities are lower for YWD compared to able-bodied youth (Arim, Findlay, & Kohen, 2012; Imms, 2008; Westendorp, Houwen, Hartman, & Visscher, 2011). Further, the percentage of youth who participate on sports teams is significantly lower for YWD compared to able-bodied youth (Rimmer & Rowland, 2008). There is a need for strategies to promote and support PA for YWD.

### **Risks Associated with Physical Inactivity for Youth with Disabilities**

Physical inactivity is the fourth leading risk factor for global mortality (World Health Organization, 2017). Given the low levels of activity among YWD, they can be considered particularly vulnerable to the risks associated with physical inactivity. Not only are YWD vulnerable, but the risks of inactivity are multiplied for YWD as they are three to six times more

likely to be obese compared to able-bodied youth (Rimmer & Rowland, 2008; Glowacki, Centeio, Van Dongen, Carson, & Castelli, 2016). Those who are physically inactive are at risk for developing chronic diseases such as cardiovascular complications, diabetes, musculoskeletal disorders, as well as cancer (World Health Organization, 2017). Even further, YWD who are inactive are also at risk for developing psychosocial related health concerns such as decreased self-esteem, decreased social acceptance, and eventually a greater reliance on others for day-to-day living (Murphy & Carbone, 2008). Behaviour patterns and habits of physical inactivity in the stages of youth development generally track into adulthood (Foxhall, 2006), so it is important to establish positive lifestyle habits during crucial years of development. Given the myriad risks associated with physical inactivity, it is important to create promotional strategies such as messages that target PA specifically within the population of YWD.

### **Benefits of Physical Activity for Children and Youth with Disabilities**

Engaging in regular PA can help decrease the aforementioned risk of physical inactivity. PA is especially beneficial for YWD with regard to a number of physical and psychosocial outcomes (Blinde & Taub, 1999; Taub & Greer, 2000; Bloeman et al., 2004; Blinde & Taub, 1999; Lauruschkus, Nordmark, & Hallstrom, 2015; Maher, 2015). Many YWD experience what is known as a sense of “empowerment deficit” characterized by lack of perceived competence and social isolation (Blinde & Taub, 1999). PA can reduce the empowerment deficit experienced as it provides a number of empowerment opportunities allowing for YWD to increase perceived competence, facilitate goal attainment, and promote social integration (Blinde & Taub, 1999). Further, the PA environment fosters the development of a social identity and social ties to others by providing a space for YWD to interact with peers (Taub & Greer, 2000). PA allows for YWD to understand their abilities, feel stronger, enhance their movement abilities, become aware of

their potential, and increase their self-efficacy (Taub & Greer, 2000; Bloeman et al., 2014).

Indeed, there are many benefits of participating in PA for YWD and there is a need for evidence-based strategies to effectively promote PA for YWD.

### **Barriers to Participating in Physical Activity for Youth with Disabilities**

Unfortunately, PA is often perceived as only for those who are able-bodied (Anderson, 2009). Researchers have identified a number of barriers that hinder PA participation for YWD. These barriers include: physical and mobility impairments (Mihaylov, Jarvis, Colver, & Beresford, 2004; Lauruschkus, Nordmark, & Hallstrom, 2015; Martin Ginis, Latimer-Cheung, & Rimmer, 2016), lack of accessible and inclusive equipment, inappropriate equipment, inability to access the environment as a whole (Mihaylov et al, 2004; Taub & Greer, 2000), lack of necessary or knowledgeable staffing (Rimmer & Rowland, 2008), and peer bullying (Mihaylov et al., 2004; Taub & Greer, 2000). Parents of YWD have expressed concerns about their children's PA, reporting that a lack of funding for play, safety, and learning facilities are a large barrier to have their children participate in PA (Mihaylov et al., 2004). Parents also express that there is ambiguity and confusion regarding the use of terms such as "inclusive" or "accessible" within PA promotional resources or sources of information, which makes it difficult to find appropriate PA opportunities (Bassett-Gunter, Ruscitti, Latimer-Cheung, & Fraser-Thomas, 2017). All of these factors can act as a significant hindrance to promoting PA and sport participation among the YWD population.

Generally, national sport and PA agencies focus on the promotion of PA for able-bodied youth and there is a lack of promotional strategies specifically targeting YWD. While some organizations and communities are making efforts to create inclusive PA programs for YWD, there is a great need for successful *promotion* of PA messages that highlight PA opportunities.

The success of a PA program for YWD can be attributed to how effectively it is promoted and advertised toward a target population (Gorter, Galuppi, Gulko, Wright, & Godkin, 2016). Parents of YWD expressed that there are programs available for them, but people do not know how or where to find them which speaks to the promotion of these programs (Bassett-Gunter, et al., 2017). Without effective PA promotional messages, it is near impossible to increase PA participation for YWD. Even further, there is little research to inform the strategic development of PA promotion messages targeting YWD.

### **Using Messages to Promote Physical Activity for Youth with Disabilities**

There are a number of messaging and promotional strategies that may be valuable in promoting PA for YWD. A community-based consensus revealed that community PA strategies targeting youth with Cerebral Palsy, and YWD in general, should focus on two main suggestions: i) raising awareness of the options and opportunities for participating in PA, and ii) developing strategies that garner the interest and attention of YWD to become motivated to participate in PA (Gorter et al., 2016). This research concludes that the key to motivating YWD to engage in PA is to encourage them to try different activities to identify their preferred mode of PA (Gorter et al., 2016). This is important to note as motivation strategies can be incorporated into effective messaging strategies targeted to YWD encouraging them to participate in PA.

Community organizations that lead PA promotion can employ PA campaigns and messages to promote PA for all children and youth including YWD. Likewise, sport and PA organizations that serve YWD can benefit from evidence regarding effective messaging strategies targeting YWD. There is value in drawing on the existing messaging literature regarding PA promotion for general populations. For example, some PA messaging research has focused on able-bodied youth. A major PA campaign known as VERB from the United States

used messages specifically targeting youth and has found success in encouraging them to be more active through a collaborative mass effort. In a survey of American youth, 74% of participants expressed awareness of the VERB campaign and self-reported an increase in PA following message exposure (Huhman, Potter, Wong, Banspach, Duke, & Heitzler, 2005), suggesting that there is a positive relationship between awareness of PA messages and PA levels. Moreover, youth with a greater recall of the messages had more positive beliefs and evaluations about PA as well as higher PA levels compared to youth who had lower rates of message recall (Huhman et al., 2005; Price, Potter, Das, Wang, & Huhman, 2009).

Another Canadian PA campaign, Long Live Kids, consisted of Public Service Announcements directed to able-bodied youth and parents. An evaluation of this campaign revealed that 57% of the youth in the survey could recall the advertised messages and 57% reported increased free-time PA following message exposure (Faulkner, Kwan, & MacNeill, 2011). These findings suggest that not only is awareness of a campaign a key variable in effective messaging, but having these messages targeted to an audience proves successful. Further, targeted messages have the potential to bring about change in attitudes and behavioural intention, as well as PA adoption (Huhman, Bauman, & Bowles, 2008). The findings of these studies demonstrate the effectiveness of messages targeting youth for changing attitudes toward PA and PA behaviour and suggests that messaging strategies may be valuable in promoting PA for able-bodied youth. However, there is no known research regarding the use of PA messages to promote PA among YWD. Although there is significant research aimed at understanding the development of effective PA messaging in general, it would be problematic to assume that existing PA messages would be effective for YWD because YWD have unique needs and barriers regarding participating in PA.

## **How to Develop Effective PA Messages Targeting YWD**

In general, the likelihood of a behaviour occurring is positively correlated with the consistent promotion of that behaviour (Lobstein, Jackson-Leach, Moodie et al., 2015). In order to support PA behaviour change, PA campaigns must consistently and effectively promote PA behaviour. When messages are crafted and spread to an audience effectively, they can impact and influence the behaviour of the target population (Berry & Latimer-Cheung, 2013). Successful campaigns are grounded in sound psychosocial behaviour change theory (Berry & Latimer-Cheung, 2013) and target variables that are related to behaviour change. In relation to PA, messages should focus on presenting the benefits of PA (Berry & Latimer-Cheung, 2013; Rothman, Updegraff, & Salovey, 2012; O’Keefe & Jensen, 2007; Gallagher & Updegraff, 2011). To understand how to effectively develop messages about PA to YWD, we can draw upon results of previous studies investigating effective PA messages for able-bodied youth.

One of the reasons why the VERB campaign was successful is because it was able to target youth’s attitudes about engaging in PA (Huhman, Bowman, Bowles, 2008; Price, Huhman, Potter, 2005). Campaign directors identified factors that motivate youth to be more physically active such as having fun with friends, exploration, adventure, and a non-judgemental environment (Asbury et al., 2008). By identifying these motivators, the campaign was able to strategically use PA messages to target youth (Mattson & Basu, 2010). The success of the VERB campaign suggests that experiences of PA and attitudes towards PA are important to youth. Therefore, it would be beneficial to understand how YWD’s attitudes are influenced by PA messages.

In addition to considering existing evidence for creating PA messages targeting able-bodied youth, parents of YWD can provide insight regarding the development of optimally

effective PA messages for YWD. Parents of YWD suggest that there are many challenges to obtaining information about PA for their children such as a lack of inclusive messaging and images, lack of accessible information, and a lack of language clarity (Bassett-Gunter et al., 2017). Parents suggest that information and inclusive images from reliable organizations would be valuable in promoting PA for YWD (Bassett-Gunter et al., 2017) However, it is unknown whether YWD feel the same way. There is no known research to have examined how YWD perceive messages that promote PA. Although there is evidence suggesting that using PA messages can change attitudes toward PA (Asbury et al., 2008; Huhman, Bauman, & Bowles, 2008) and PA behaviours among able-bodied youth (Huhman et al., 2005; Price et al., 2009), there is a lack of research regarding YWD specifically. It is unknown if using general PA messages for youth would be effective for promoting PA among YWD or if this population would benefit from targeted messages. There is a need for research to understand the effects of PA messages on intentions to participate in PA, attitudes toward PA, and attitudes toward existing PA messages among YWD. Such research can inform the development of effective PA messages to promote PA among YWD.

### **Targeted PA Messages for Youth**

It is important to consider the needs and preferences of a targeted audience such that campaigns can create messages of increased relevance (Aeffect, 2001). Relevance is important because it dictates how much attention will be given to the message (Cacioppo, Petty, Kao, & Rodriguez, 1986). By enhancing the relevance of a message, it is theorized that the audience will actively process the information and subsequently the message will produce greater changes in health behaviours such as PA (Cacioppo et al., 1986). One messaging strategy that can help garner the attention and personal relevance of YWD is the use of targeted messages. Message

targeting is a marketing strategy in which a message is targeted to the specific needs of the audience and can be an effective method to promoting behaviour change (Noar, Harrington, Van Stee, Aldrich, 2011). Targeted messages are customized to a specific subgroup of a population that can have similar demographics or behavioural characteristics (Ryan, Skinner, Farrell, & Champion, 2001; Schmid, Rivers, Latimer, & Salovey, 2009). Messages that are targeted to an audience present information that are consistent with their behavioural characteristics (Schmid, Rivers, Latimer, & Salovey, 2009). In order for targeted messages to be successful, information about the subgroup being targeted must be obtained to optimize the creation of optimally effective messages. While targeted messages are likely a valuable strategy that can be used to target YWD and promote PA, there is a dearth in the literature that aims to understand the messaging needs and preferences of YWD specifically. Therefore, it would be valuable to examine how YWD perceive existing PA messages to understand their effectiveness.

Indeed, using targeted PA messages are more effective than generic PA messages (Latimer, Brawley, & Bassett, 2010). Youth who evaluated the VERB campaign expressed that message content emphasizing finding one's passion through PA and sport (Aeffect, 2001), messages that stressed the associated benefits of feeling good about oneself (Aeffect, 2001), messages explicitly stating the benefits of PA (CDCa), and messages depicting inclusive environments for all body types (CDCa) were most favourable and preferred. Messages that generated feelings of happiness, fun, and excitement related to participating in PA were most effective in promoting PA for children and youth (CDCa). Youth who provided feedback about the VERB campaign expressed that they viewed PA as "fun" while they perceived exercise as "required" or "unenjoyable" (Aeffect, 2000). All of the aforementioned research lends to



understanding the preferences of able-bodied youth with regards to developing targeted PA promotion messages, but there is a lack of understanding the messaging needs of YWD.

There are surely many similarities between able-bodied youth and YWD with regard to PA promotion. For example, framing PA as fun and explorative is a common appeal to PA for both able-bodied youth (CDCa) and YWD (Gorter, et al., 2016). However, there may be differences between able-bodied and YWD with regard to effective messaging strategies. Unfortunately, there is a lack of research regarding PA messaging effectiveness and preferences among YWD. For example, there is no known research regarding the effectiveness of PA messages targeted toward able-bodied youth on the attention, perceived relevance, or meaning on YWD. There is value in understanding whether YWD identify as part of the target audience when viewing messages geared toward able-bodied youth. Improved understanding of the effectiveness and meaningfulness of PA messages among YWD can inform the development of PA messages that are effective to promote PA among YWD. Further, there is a need for research to understand any specific needs and preferences of YWD.

#### **A framework for understanding effective PA messages targeting YWD:**

##### **The Social Issue Advertising Believability Model (SIABM) by O’Cass and Griffin (2006)**

One framework that is useful for guiding research regarding the development of optimally effective PA messages for YWD is the Social Issue Advertising Believability Model (SIABM) developed by O’Cass and Griffin (2006). The SIABM has been employed in various studies targeting health behaviours (O’Cass & Griffin, 2006). The SIABM theorizes that behaviour change related to message viewing is influenced by several factors including: 1) believability of the message, 2) involvement in the social issue, 3) attitudes toward the message content and the desired behaviour, and 4) attention paid to the message. These variables are

thought to influence a message recipient's intention to carry out the target behaviour (O'Cass & Griffin, 2006). The SIABM is related to "social issue" advertisements and has been applied to understanding PA promotion as a social issue. For the proposed study, PA participation among YWD would be the target social issue. The SIABM posits that the degree of attention, believability, and involvement that a message evokes has the ability to impact the target audience's (i.e., YWD) attitudes toward the social issue (i.e., PA) and intentions to comply with the messages being presented (O'Cass & Griffin, 2006). For example, if a PA message elicits high attention, believability, involvement, and positive attitudes toward the message, then YWD should have enhanced intentions to participate in PA (O'Cass & Griffin, 2006). The SIABM has been used to evaluate PA messages and it was found that messages that were perceived as believable had the ability to impact attitudes of the audience (Berry, Jones, McLeod, & Spence, 2011). Furthermore, studies using the SIABM have shown that attention to a PA message is a key predictor of PA following message exposure (Berry, Craig, Faulkner, Latimer, Rhodes, Spence, & Tremblay, 2014). Although there is no known research using the SIABM to evaluate PA messages targeted toward youth, or YWD, it is a valuable framework for understanding PA messaging because it identifies key variables that are antecedents to motivating behaviour change: attention, believability, issue involvement, and attitudes toward the message content. The following section describes each component of the SIABM in relation to PA messaging.

### **Attention**

For a message to be processed effectively, it must first garner the attention of the targeted audience (Greenwald & Leavitt, 1984). Even further, simply being aware of a PA campaign and the foundational messages of the campaign can also positively influence antecedents of behaviour such as attitudes toward PA, beliefs, and intention (Huhman et al., 2005; Price et al.,

2009; Huhman, Bauman, Bowles, 2008). Messages that meet the needs and preferences of the targeted audience can evoke greater attention paid to a message and in turn increase comprehension of the message (Hawkins et al., 2008; Asbury et al., 2008; Aeffect, 2000; Aeffect, 2001; CDCa). As attention and awareness are the first crucial steps to message processing (Greenwald & Leavitt, 1984), it is important to create PA messages that attract the attention of the targeted audience. Indeed, attention to PA messages is positively correlated with PA following message exposure (Berry et al., 2014). There is no known research examining attention in relation to PA message effectiveness among YWD.

### **Believability**

Once a message attracts attention, the target audience can either decide to accept or reject the message (Cacioppo et al., 1986). Believability of a message is defined as the truthfulness of the message as perceived by the audience whereas a higher believability of a message lends to greater acceptability of the content (Beltramini, 1982). For example, in the context of PA and youth, the more a message portrays and advertises PA as achievable, believable, and desirable, the more likely it will affect antecedents related to behaviour change (Aeffect, 2000; Aeffect, 2001). Attitudes toward the target behaviour are positively correlated with message believability (O’Cass & Griffin, 2006) such that the more a message is seen to be believable in portraying desirable social behaviour, the more the message has potential to positively affect attitudes toward the issue and intention to carry out behaviour (O’Cass & Griffin, 2006). Specific to PA, believability of PA messages is positively related to PA attitudes and intentions (Berry et al., 2011). Understanding message believability in relation to PA messages among YWD could be valuable to inform the development of effective messages targeting YWD. There is no known research examining believability of PA messages among YWD.

## **Involvement**

Message involvement depends on one's perceived relevance of the social issue (e.g., PA for YWD) within a message based on his or her "inherent needs, values, and interests" (Zaichkowsky, 1985, p. 342). In the case of PA messaging, PA is not a tangible object of a message, but rather a social issue. Therefore, involvement in a social issue is defined as the level of meaningfulness or importance of the social issue in the individual's life (O'Cass & Griffin, 2006). It is understood that involvement is a pivotal variable within the realm of advertisements and messaging communication (Greenwald & Leavitt, 1984). Social issue involvement is positively correlated with personal relevance (O'Cass & Griffin, 2006) whereas, the more personally relevant the issue, the more motivated one is to evaluate and cognitively process the message (Petty & Cacioppo, 1979; Hajjat, 2003). If the message provides a personally relevant stimulus, individuals are more willing to be attentive to the message and process it (Buchholz & Smith, 1991; Gill, Grossbart, & Laczniak, 1988; Petty & Cacioppo, 1979). Attention is also positively correlated and has a reciprocal relationship with involvement (O'Cass & Griffin, 2006). Whereas high attention is related to high involvement, high involvement in the social issue will also result in more attention paid to the message (O'Cass & Griffin, 2006). Therefore, it is important that PA messages effectively attract attention and utilize marketing strategies to elicit high involvement in order to maintain the attention of the audience. Message involvement has been found to have a mediating effect on message believability (Wang, 2006), suggesting that messages must garner involvement in order to be believable.

Message targeting can help increase the personal relevance of a message by targeting the specific needs of the targeted audience (CDCa; Aeffect, 2000). Messages that garner a higher sense of involvement also have a higher personal relevance (O'Cass & Griffin, 2006). Among

able-bodied youth, PA messages that were perceived as meaningful and relevant positively impacted self-reported PA (CDCa; Aeffect, 2000). Messages that are perceived as meaningful and relevant can have positive effects on the involvement levels of the targeted audience. Therefore, individuals developing PA messages should consider targeting audience's involvement and personal relevance when developing PA messages. However, there is no known research regarding perceptions of involvement among YWD exposed to existing PA messages, nor is there research to inform the development of PA messages that optimize involvement for YWD (e.g., highly meaningful and relevant).

### **Attitudes**

Attitudes can be defined as “global and relatively enduring evaluations of objects, issues or persons” (Petty, Unnava and Strathman 1991, p. 242). Attitudes encompass the degree of favourableness or unfavourableness of the behaviour (Ajzen, 1991) and exist on a continuum from negative to positive (Fishbein & Ajzen, 1975). One's attitudes toward a behaviour are an important determinant of engaging in said behaviour (Fishbein & Ajzen, 1975; Sheppard et al., 1988). Attitudes are an important construct to measure and understand as it is a high predictor of intention to participate in a behaviour as well as a key construct linked to motivation (Ajzen, 1991; Fishbein & Ajzen, 1975). Attitudes toward PA is a result of the beliefs that participating in PA will result in certain outcomes and the positive or negative consequences of these outcomes (Deforche, Lefevre, De Bourdeaudhuij, Hills, Duquet, & Bouckaert, 2003). One's attitudes toward PA can be articulated as the perceived benefits minus the perceived barriers (Deforche et al., 2003). Attitudes toward PA can be divided into one's affective and instrumental attitudes (Ajzen, 1991). Affective attitudes refer to emotional responses to the thought of performing a behaviour (e.g. pleasant or unpleasant), while instrumental attitudes refer to the cognitive process

of assessing the costs or benefits of performing a behaviour (e.g. healthy or unhealthy; French, Sutton, Hennings, Mitchell, Wareham, Griffin, Hardeman, & Kinmonth, 2005; Lowe, Eves, & Carroll, 2002). Therefore, attitudes toward a desired behaviour will be more favourable if the outcomes of that behaviour are perceived as more pleasant and beneficial (Lowe, Eves, & Carroll, 2002). The immediate physiological effects of PA are negative, as people experience discomfort and fatigue, which makes motivation to engage in PA difficult to enhance (Lowe, Eves, & Carroll, 2002; Eves, 1995). Therefore, it is important to understand YWD's attitudes toward PA messages in order to develop optimally effective messages.

According to the SIABM, there are a number of variables that play a critical role in changing attitudes, which are an antecedent to behaviour change. It is theorized that attitudes are affected by one's level of social issue involvement such that individuals with high involvement are likely to maintain or strengthen their attitudes toward the social issue following message exposure (Laczniak & Muehling, 1993; O'Cass & Griffin, 2006). Alternatively, individuals who have little involvement may not pay attention to or process the message in enough depth to result in attitude change (O'Cass & Griffin, 2006; Petty, Haugtvedt & Smith, 1995). Therefore, it is implied that attitude change is positively related with social issue involvement.

PA messages targeting youth have sought to positively influence attitudes toward PA (Huhman et al., 2008; Asbury et al., 2008). Messages that present PA as appealing, easy, fun, and beneficial can positively impact youth's attitudes toward PA (Reed, Wooten, & Bolton, 2002; Huhman, Potter, Duke, Judkins, Heitzler & Wong, 2007). PA messages that are targeted to a specific audience are more effective at strengthening attitudes about participating in PA compared to generic messages (Langille, Berry, Reade, Witcher, Loitz, & Rodgers, 2011). The VERB campaign has been successful in changing youth's attitudes about participating in PA.

Positive attitudes were consistently attributed to the VERB campaign and as the campaign progressed, attitudes toward PA increased (Asbury et al., 2008). After two years of the VERB campaign, a positive relationship between message viewing and attitudes regarding PA was observed (Huhman et al., 2007). Indeed, PA messages targeting youth can effectively change attitudes toward PA. These studies highlight the role that attitudes play in effective PA messages toward youth and highlight the importance of depicting PA as fun and enjoyable. However, there is a lack of research that examines how PA messages that target able-bodied youth would effectively target YWD as well. Therefore, it would be beneficial to examine whether PA messages targeted toward able-bodied youth or YWD would work best to motivate YWD.

### **Intention**

Intention is an important predictor of behaviour (Fishbein & Ajzen, 1975; O’Cass & Griffin, 2006). Intention is characterized by a person’s readiness or motivation toward performing a behaviour (Ajzen, 2002). Attitudes and beliefs influence one’s intention and motivation to comply with a message and carry out the behaviour (Ajzen, 1991). Based on the SIABM, intentions are influenced by believability, involvement, attention, and attitudes (O’Cass & Griffin, 2006). These four variables work together in an interlinked web as determinants to predicting intentions related to behaviour change (O’Cass & Griffin, 2006).

There is no known research regarding PA intentions among YWD following exposure to PA messages. PA messages that are targeted to YWD and perceived as believable, personally relevant to evoke involvement, and create positive attitudes toward PA, could have the potential to positively influence intention to participate in PA. Therefore, it would be valuable to understand how PA messages can effectively meet the needs and preferences of YWD to motivate PA.

## **Purpose**

Guided by the SIABM, the primary purpose of this study was to examine the effectiveness of existing PA messages among YWD. Specifically, this thesis examined the effects of PA messages on attitudes toward PA and intention to participate in PA among YWD. The secondary purpose was to identify SIABM constructs (i.e., attention, believability, involvement, and attitudes) as predictors of intention post-viewing to participate in PA following exposure to PA messages.

The research study had three specific research objectives in relation to YWD:

- 1) To examine the effects of PA messages to change attitudes toward PA and intention to participate in PA.
  - ii. To compare the effects of various PA messages to change attitudes and intention toward PA.
- 2) To examine differences in attention, relevance, believability, and attitudes toward various PA messages as well as understand which message was most preferred.
- 3) To determine if SIABM constructs predict intention to participate in PA post message viewing.

## **Hypotheses**

Guided by the SIABM (O’Cass and Griffin, 2006) and previous research findings regarding message effectiveness (Huhman et al., 2005; Price et al., 2009; Huhman, Bowman, & Bowles, 2008; Berry & Latimer-Cheung, 2013; Price, Huhman, Potter, 2005; Mattson & Basu, 2010; Bassett-Gunter et al., 2017; Asbury et al., 2008; Gorter, et al., 2016):



- 1) We hypothesize that there will be a positive change in attitudes toward PA and intention to participate in PA following message exposure. We have made no a priori hypothesis regarding the relative effectiveness of various messages given that there is no previous research to guide such a hypothesis.
- 2) We have made no a priori hypothesis regarding differences in attention, relevance, believability, and attitudes given that there is no previous research to guide such a hypothesis. We hypothesize that the targeted message will be most preferred.
- 3) We hypothesize that attention, believability, involvement, attitudes toward the message content, attitudes toward the video, and attitudes toward PA will be positive predictors of intentions to participate in PA post-viewing. We have made no a priori hypothesis regarding which SIABM constructs would be most strongly related to post-viewing PA intentions because there is not enough prior research to form a hypothesis.

## **Method**

### **Participants**

Participants included youth with physical disabilities (YWD) between the ages of 10-21. We defined youth as anyone between the ages of 10-21. At the low end of this age range, we wanted to include participants who were old enough to read, understand, interpret, and respond to survey questions. At the upper end of this age range, we included older youth to align with definitions of youth by other stakeholders in the disability community. For example, United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2017) considers youth to include individuals up to 24 years of age. Participants were recruited from within Canada through: a) web and poster advertisements (Appendix A), b) previous studies and organizations

that support PA for YWD such as Canadian Tire's "Jumpstart" Foundation, c) social media, and d) snowball sampling. Snowball sampling occurs when participants in a research study provide information to other members of the study's desired population in order to recruit more participants (Noy, 2008). Inclusion criteria were limited to include only youth with a physical disability as the survey included questions that some youth with other types of disabilities (e.g., intellectual, developmental, etc.) may not be capable of answering independently. Physical disability was defined as "any degree of physical disability, infirmity, malformation or disfigurement that is caused by bodily injury, birth defect or illness and, without limiting the generality of the foregoing, includes diabetes mellitus, epilepsy, a brain injury, any degree of paralysis, amputation, lack of physical co-ordination, blindness or visual impediment, deafness or hearing impediment, muteness or speech impediment, or physical reliance on a guide dog or other animal or on a wheelchair or other remedial appliance or device" (Ontario Human Rights Commission, 2017). Participation was voluntary and informed consent from both the participant and the participant's legal parent or guardian (if the participant was under the age of 16) was obtained prior to data collection. Participants received an honorarium of \$20.00 in the form of an electronic gift card.

### **Sample Size**

In order for statistical analyses to achieve statistical power, a study sample of at least 60 participants was recruited. Sample size was calculated using power analyses software known as G\*Power (Erdfelder, Faul, & Buchner, 1996). According to Cohen (1992), approximately 20 participants per video condition group were needed to have 80% power ( $\alpha=.05$ ) to detect a large effect size (Erdfelder, Faul, & Buchner, 1996). Other messaging research involving PA messages and able-bodied youth have sought to achieve large effect sizes and have succeeded (Huhman et

al., 2007; Price et al., 2008; Synder, Hamilton, Mitchell, Kiwanuka-Tondo, Fleming-Milici, & Proctor, 2004), therefore justifying the choice of large effect sizes for this study.

## **Procedure**

Following recruitment and informed consent from both the participant and his/her parent or guardian, participants were emailed a link to complete the survey via the [www.surveymonkey.com](http://www.surveymonkey.com) platform. The survey began with a baseline questionnaire that assessed demographics, PA behaviour, attitudes toward PA, intention to participate in PA, and social issue involvement. Once participants completed the baseline questionnaire, they were randomly assigned to view one of three PA messages in the form of a short video. Participants were asked to view the PA message in its entirety. Once viewing was complete, participants completed a post-viewing questionnaire which assessed attitudes toward PA, intention to participate in PA, and social issue involvement, as well as message evaluations including: message relevance, message believability, attention paid to the message, attitudes toward the message content, and attitudes toward the video. Participants then viewed the other two messages and completed an evaluation for each message (i.e., message relevance, message believability, attention paid toward the message, attitudes toward the message content, and attitudes toward the video). Finally, participants were asked to rank the messages in terms of preference. All procedures were approved by York University's Research and Ethics Board.

## **Materials**

**PA messages.** Participants were exposed to a series of messages delivered in the form of videos from various PA campaigns. The chart below explains the content of each message, which was categorized into a "video type". The "neutral" message was one that did not depict any youth within the video. The "targeted" message was one that targeted YWD specifically.

Finally, the “non-inclusive” message was one that depicted only able-bodied youth. The videos were each 30 seconds in length and were embedded within the surveys administered to participants. Video links are included in Appendix B.

Table 1. *Video Type and Descriptions of Message Content*

<b>Video Type</b>	<b>Source</b>	<b>Description of Content</b>
Neutral	ParticipACTION	Depicts a series of sports equipment that are portrayed to be sad because they are not being played with because screen time is taking away play time. Encourages youth to “make room for play” in their daily lives. This video does not include any children (able-bodied or YWD) in any image.
Targeted	Paralympic	Depicts YWD engaging in PA as well as daily youth social activities. Depicts PA as a way of gaining confidence and important life skills.
Non-inclusive	VERB	Depicts a variety of able-bodied children and youth engaging in PA with a series of action verbs that describe being active (e.g. jump). Encourages youth to find their “verb” that motivates them to be active. This video does not include any YWD in any image.

## **Measures**

### *Demographics*

Participants self-reported age, gender, and current education level, using a series of drop-down options. They were also asked to describe their disability in further detail with an open-ended comment box.

### *Physical Activity*

PA was assessed using three adapted items from the Canadian Health Measure Survey – Household Questionnaire (Statistics Canada, 2014). Participants were provided with a definition of PA and were asked to record how many days and for how long they did PA for at least 60 minutes per day within a one-week span (Appendix C – Measure of Physical Activity). To

capture any PA that was not completed in 60-minute bouts of time, three questions from the Leisure Time Physical Activity Questionnaire for People with Spinal Cord Injury were used (LTPAQ-SCI; Martin Ginis & Latimer-Cheung, 2007). Participants were provided with definitions of mild, moderate, and heavy LTPA and were asked to record how many days and for how long they did each type of LTPA within a one-week span (Appendix C – Measure of Physical Activity).

#### *Attitudes Toward Physical Activity*

Attitudes toward PA were measured with nine items. Items 1-7 were developed from the Youth Campaign Longitudinal Survey (CDC, 2002-2004). Participants were asked “If I did 60 minutes of physical activities on most days...” followed by: 1) *It would keep me in shape*; 2) *It would be boring*; 3) *It would be fun*; 4) *It would help me make new friends*; 5) *It would help me spend more time with my friends*; 6) *It would make me feel good about myself*; 7) *It would keep me from doing other things I like better*. These items have been used in other message evaluations among youth, specifically the evaluation of the VERB campaign (Huhman et al., 2007; Huhman et al., 2009; Potter et al., 2008). Items 8-9 were added to capture beliefs salient to many YWD (Tanna, Arbour-Nicitopoulos, Rhodes, & Bassett-Gunter, 2017); “If I were to engage in 60 minutes of physical activity daily, it would” followed by 1) *help me feel a sense of normalcy*; and 2) *put me at risk for injury and pain*. These items were developed as part of a larger scale specifically used for parents of YWD (Tanna et al., 2017) and were adapted for this study. Participants answered all nine items on a 5-point Likert-type scale (1=strongly disagree to 5=strongly agree; items 2, 7, and 9 were reverse scored). Reliability was calculated at baseline (Cronbach, 1951)  $\alpha = (\text{Baseline} = .69)$ . Item 5 was removed from the scale because it had a response rate of 43% which was below an established cut off of 50% response rate. Further, the removal

of item 5 allowed for higher reliability within the scale at baseline. Item 5 within the survey asked participants about PA and friendship. Considering that approximately 50% of parents of youth with disabilities report their child/ren having 0-1 friend (Snowdon,2012), participants within the study may have felt uncomfortable with answering item 5, leading to the low response rate. A reliability score for Attitude PA post-viewing could not be calculated due to missing data.

#### *Intention to Participate in Physical Activity*

Intention to participate in PA was measured using two items scored on a 5-point Likert-type scale (1=strongly disagree to 5=strongly agree): 1) *I intend to participate in physical activity 60-minutes each day*; 2) *I will try to participate in physical activity 60-minutes per day* (Ajzen, 2002). Variations of this intention scale have been used among the general population (Tanna et al., 2017; Berry et al., 2011; Rhodes, Spence, Berry et al., 2016) and among people with disabilities (Arbour-Nicitopoulos, Martin Ginis, & Latimer, 2009; Bassett-Gunter, Martin Ginis, & Latimer-Cheung, 2013). Reliability was calculated using a Pearson Correlation at baseline and post-viewing ( $r_{\text{Baseline}} = -.35$ ,  $r_{\text{Post-viewing}} = -.52$ ; Field, 2009).

#### *Social Issue Involvement*

Social issue involvement was measured using eight items from the 20-item Personal Involvement Inventory Scale (Zaichkowsky, 1985), which has been previously used to evaluate involvement with social issues and messages (O’Cass & Griffin, 2006; Jarvis et al., 2014; Wang, 2006; Hallahan, 1999; McQuarrie & Munson, 1987). Participants were asked to respond to the statement “Please rank the issue of increasing your physical activity as...” 1) *important/unimportant*, 2) *of concern to me/ of no concern*, 3) *irrelevant/relevant*, 4) *means a lot to me/means nothing to me*, 5) *matters to me/doesn’t matter*, 6) *interesting/boring*, 7) *significant/insignificant*, 8) *needed/not needed*. Participants answered using a scale ranging from

1-7 (e.g. 1=unimportant to 7=important). Reliability was calculated using Cronbach's alpha (Cronbach, 1951)  $\alpha = (\alpha_{\text{Baseline}} = .98, \alpha_{\text{Post-viewing}} = .86)$ .

### *Message Relevance*

Participants responded to two items that assess personal relevance: 1) "How relevant was the information in the video to you?" and 2) "How useful was the information in the video to you?" (Ahluwalia, Unnava, & Burnkrant, 2001). Items were answered using a Likert-type scale ranging from 1 to 7 (1=not at all to 7=very). Message relevance was also measured using the Perceived Message Relevance Scale (Jensen, King, Carcioppolo, & Davis, 2012; Jensen, King, Carcioppolo, Krakow, Samadder, & Morgan, 2014). Participants were asked to indicate their level of agreement with four statements on a 7-point Likert scale (1=strongly disagree to 7=strongly agree): 1) "The video seemed to be written personally for me."; 2) "The video was relevant to my situation."; 3) "The video was mostly general information that wasn't applicable to me."; and 4) "The video was not customized at all." The items within this measure were collapsed and reliability was calculated using Cronbach's alpha (Cronbach, 1951) for each video and overall: ( $\alpha_{\text{First video}} = .73, \alpha_{\text{Second video}} = .79, \alpha_{\text{Third video}} = .80, \alpha_{\text{Average}} = .77$ ).

### *Message Believability*

Message believability was measured using the Advertising Believability Scale (Beltramini, 1988) which has been used in studies regarding social issue messaging evaluations (O'Cass & Griffin, 2006; Jarvis, Gainforth, & Latimer-Cheung, 2014; Berry, et al., 2011; Berry et al., 2014). Participants were asked "to what extent do you believe the PA message was..." 1) *informative/not informative*; 2) *trustworthy/untrustworthy*; 3) *accurate/inaccurate*; 4) *convincing/unconvincing*; 5) *believable/unbelievable*. Participants answered using a scale ranging from 1-7 (e.g. 1=not informative to 7=informative). Reliability was calculated using

Cronbach's alpha (Cronbach, 1951) after viewing each message as well as overall ( $\alpha_{\text{First video}} = .88$ ,  $\alpha_{\text{Second video}} = .91$ ,  $\alpha_{\text{Third video}} = .92$ ,  $\alpha_{\text{Average}} = .90$ ).

#### *Attention Paid Toward the Message*

Attention paid toward the message was measured using four items (Laczniak, Muehling, & Grossbart, 1989): 1) "How much attention did you pay to the video?"; 2) "How much did you concentrate on the video?"; 3) How involved were you with the video?"; and 4) "How much thought did you put into evaluating the video?". Questions were answered using a Likert-type scale (1=not at all to 7=very). This measure has been applied in previous research involving social issue advertising (O'Cass & Griffin, 2006; Berry et al, 2011) and with a parent population evaluating PA advertisements (Berry et al., 2014). Reliability was calculated using Cronbach's alpha (Cronbach, 1951) after viewing each message as well as an average message attention score ( $\alpha_{\text{First video}} = .78$ ,  $\alpha_{\text{Second video}} = .84$ ,  $\alpha_{\text{Third video}} = .80$ ,  $\alpha_{\text{Average}} = .81$ ).

#### *Attitudes Toward the Message Content*

Attitudes toward the message content was measured using five items from Hallahan (1999) and adapted from Wang (2006). This scale has been used in message evaluation studies (Hallahan, 1999; Wang, 2006). Participants were asked to complete the statement "the messages in the advertisements are...": 1) *boring/interesting*; 2) *not attention-getting/attention-getting*; 3) *bad/good*; 4) *not fun/fun*; 5) *do not like it/like it*. Participants answered using a scale ranging from 1-7 (e.g. 1=boring to 7=interesting). Reliability was calculated using Cronbach's alpha (Cronbach, 1951) after viewing each message as well as an average attitudes toward the message content score ( $\alpha_{\text{First video}} = .86$ ,  $\alpha_{\text{Second video}} = .90$ ,  $\alpha_{\text{Third video}} = .93$ ,  $\alpha_{\text{Average}} = .90$ ).



### *Attitudes Toward the Video*

Attitudes toward the video (e.g., message content, message delivery, advertisement structure, visuals, sounds) was measured using six items developed from Hallahan (1999) and adapted from Wang (2006). Participants were asked to complete the statement “I would describe the advertisement as...” followed by: 1) *bad/good*; 2) *unpleasant/pleasant*; 3) *low-quality/high-quality*; 4) *do not like it/like it*; 5) *not desirable/desirable*; 6) *unfavourable/favourable*.

Participants answered using a scale ranging from 1-7 (e.g. 1=bad up to 7=good, 1=unpleasant up to 7=pleasant). Reliability was calculated using Cronbach’s alpha (Cronbach, 1951) after viewing each message as well as an average attitudes toward the video score ( $\alpha_{\text{First video}} = .91$ ,  $\alpha_{\text{Second video}} = .93$ ,  $\alpha_{\text{Third video}} = .94$ ,  $\alpha_{\text{Average}} = .93$ ).

### *Messaging Preferences*

Participants were asked to rank the videos from 1 being best to 3 being worst to indicate messages preference.

The table below shows a visual of the questionnaires that were administered at the two different time points during the course of the study.

Table 2. Administration of Questionnaires at Different Time Points

<b>Appendix</b>	<b>Measure</b>	<b>Baseline (T1)</b>	<b>Post-Viewing (T2)</b>
<b>C</b>	<b>Demographics</b>	✓	
<b>C</b>	<b>PA</b>	✓	
<b>C</b>	<b>Attitudes toward PA</b>	✓	✓
<b>C</b>	<b>Intention to Participate in PA</b>	✓	✓
<b>C</b>	<b>Social Issue Involvement</b>	✓	✓
<b>D</b>	<b>Message Relevance</b>		✓
<b>D</b>	<b>Message Believability</b>		✓
<b>D</b>	<b>Attention Paid Toward the Message</b>		✓
<b>D</b>	<b>Attitudes toward the message Content</b>		✓
<b>D</b>	<b>Attitudes Toward the Video</b>		✓

### Statistical Analyses

Statistical analyses were performed using SPSS version 24 (IBM Corporation, Armonk, NY, USA). Preliminary analyses were conducted to provide a description of the sample. Outliers were identified as having a z-score of  $\pm 3.29$  (Field, 2009) and were identified for the following variables: baseline intentions ( $n=1$ ), message relevance (ParticipACTION;  $n=2$ ), message attention (ParticipACTION;  $n=1$ ), message relevance (VERB;  $n=1$ ), message attention (VERB;  $n=1$ ), Attitudes Toward the Video (VERB;  $n=1$ ), Message Relevance (Paralympic;  $n=1$ ), and

Message Believability (Paralympic;  $n=1$ ). These outlier scores were changed to the next highest or lowest acceptable score within the  $z = \pm 3.29$  criteria (Field, 2009).

Means, standard deviations, skewness, and kurtosis values were calculated for all continuous variables (Appendix F). Data were classified as normally distributed when skewness and kurtosis values were near zero, and were classified as skewed or kurtotic if the values were increasingly positive or negative (Field, 2009). Skewness and kurtosis values that were  $\pm 1$  were considered excellent, but values that were  $\pm 2$  were acceptable (George & Mallery, 2012). No transformations were performed because the skewness and kurtosis of the variables were within the acceptable range of  $\pm 2$  (George & Mallery, 2012, Ferketich & Verran, 1994).

ANOVA analyses were used to examine participant gender, age, and current education level as possible covariates for attitudes toward PA and intention to participate in PA at baseline. Participant gender,  $F(1, 58) = 10.30, p = .002$  was a significant covariate for intention to participate in PA.

To examine the effects of PA messages on attitudes toward PA as well as possible group differences based on video condition, a two (time; baseline and post-viewing) x three (video condition) repeated measures ANOVA was calculated. Because gender was identified as a covariate of intention to participate in PA, a two (time; baseline and post-viewing) x three (video condition) ANCOVA was calculated with gender as a covariate to examine changes in intention to participate in PA and possible group differences based on video condition.

In order to examine differences in message evaluations (i.e., attention, relevance, believability, involvement, attitudes towards the message content, and attitudes towards the video), a series of paired sample t-tests were calculated to compare these message evaluations

between the three video conditions. A Bonferroni adjustment was applied to adjust the p-value for identifying significant differences to  $p < 0.01$  while reducing the risk of Type 1 error.

To examine if SIABM constructs predicted intention to participate in PA post-viewing, a regression model was calculated with intention to participate in PA post-viewing as the dependent variable and the following independent variables: attention, relevance, believability, attitudes toward the message content, attitudes toward the video, social issue involvement, and attitudes toward PA.

### **Missing Data**

Descriptive statistics were run to identify missing data. Participants who answered less than 70% of the items for a given scale were removed from any analysis using that scale. In total, 11 participants were excluded for attitudes toward PA due to missing data; a sample of 49 participants was used for any analyses involving attitudes toward PA. Further, individual scale items that had data missing from more than 50% of participants were deleted. Therefore, item five from the attitudes toward PA scale was removed (56.7% missing data rate). A missing data pattern analysis was run to identify missing data patterns and Little's MCAR test were run to determine if the missing data were missing completely at random (Little, 1988). All missing data were indicated to be missing completely at random after removing the 11 participants and item five from the attitudes toward PA scale.

ANOVAs were performed to examine group equivalency between the 11 participants eliminated from the attitudes toward PA scale and the 49 participants who remained from the attitudes toward PA scale. There were no significant differences ( $p=.98$ ) between the groups on the attitudes toward PA scale.

Table 3. *Participant Characteristics*

	Total	Male	Female
% (n)	100 (60)	71.7 (43)	28.3 (17)
Age, Mean Years (SD)	17.84 (2.50)	17.14 (2.59)	18.35 (2.09)
Education, % (n)			
Elementary ( $\leq$ grade 8)	25 (15)	30.2 (13)	11.8 (2)
High School	56.7 (34)	55.8 (24)	58.8 (10)
College	11.7 (7)	11.6 (5)	11.8 (2)
University	6.7 (4)	2.3 (1)	17.6 (3)

Table 4. *Participant Baseline Physical Activity Levels*

	Mean (N=60) (SD)	Male Mean (N=43) (SD)	Female Mean (N=17) (SD)
Days per week active for at least 60 minutes	4.02 (1.63)	3.81 (1.65)	4.53 (1.51)
Days per week spent doing sports, fitness, or recreational physical activity	4.25 (1.51)	4.35 (1.45)	4.00 (1.70)
Total (minutes) spent doing moderate and vigorous activities in one week	712.10 (431.23)	703.77 (458.82)	733.18 (363.94)
Days per week spent doing _____ intensity LTPA			
1) Mild	3.72 (1.64)	3.70 (1.60)	3.76 (1.79)
2) Moderate	3.03 (1.34)	3.09 (1.32)	2.88 (1.41)
3) Heavy	1.95 (1.13)	1.98 (1.10)	1.88 (1.22)
Time (minutes) spent doing _____ intensity LTPA?			
1) Mild	474.67 (328.52)	483.02 (344.07)	453.53 (294.21)
2) Moderate	318.45 (297.37)	304.35 (295.88)	354.12 (307.23)
3) Heavy	177.86 (201.79)	175.28 (210.20)	184.35 (184.69)

Table 5. *Participant Baseline Assessment Scores by Gender*

Variable	Baseline Mean (SD)		Post-Viewing Mean (SD)	
	Boys (N=43)	Girls (N=17)	Boys (N=43)	Girls (N=17)
Attitudes Toward PA	3.85 (.41)	3.98 (.53)	3.93 (.32)	4.09 (.40)
Intentions to Participate in PA	3.88 (.32)	4.24 (.50)	3.92 (.39)	4.06 (.35)
Social Issue Involvement	5.73 (.92)	6.14 (.33)	5.79 (.84)	6.07 (.51)

## Results

### **Repeated Measures ANOVA for Attitudes Toward Physical Activity (Table 6).**

A two (time; baseline and post-viewing) x three (video condition) repeated measures ANOVA was run with attitudes toward PA as the dependent variable. There were no significant main effects for time ( $F(1, 46) = 0.50, p = 0.48$ ; partial  $\eta^2 = .01$ ) or condition ( $F(2, 46) = 0.70, p = 0.50$ ; partial  $\eta^2 = .03$ ). There was no significant time x condition interaction ( $F(2, 46) = 0.32, p = 0.73$ ; partial  $\eta^2 = .01$ ).

### **Repeated Measures ANCOVA for Intention to Participate in Physical Activity (Table 6).**

A two (time; baseline and post-viewing) x three (video condition) repeated measures ANCOVA was run with intention to participate in PA as the dependent variable and gender as a covariate. There were no main effects for time ( $F(1, 56) = 1.66, p = .20$ ; partial  $\eta^2 = .03$ ), gender ( $F(1, 56) = 2.28, p = .14$ ; partial  $\eta^2 = .04$ ), or condition ( $F(2, 56) = 0.31, p = .74$ ; partial  $\eta^2 = .01$ ). There were no time x condition interaction effects ( $F(2, 56) = .158, p = .85$ ; partial  $\eta^2 = .006$ ). There was a between subject effect for gender ( $F(1, 56) = 7.22, p = .009$ ; partial  $\eta^2 = .11$ ), indicating that boys' and girls' intentions significantly differed.

Table 6. *Attitudes Toward Physical Activity and Intention to Participate in Physical Activity Before and After Message Viewing*

Variable (N)	Baseline M (SD)	Post- Viewing M (SD)	Time F (partial $\eta^2$ )	Condition F (partial $\eta^2$ )	Time x Condition F (partial $\eta^2$ )
<b>Attitudes Toward PA (N=49)</b>	3.93 (.43)	3.98 (.35)	0.50 (.01)	0.70 (.03)	0.32 (.01)
Condition 1: Neutral Video - ParticipACTION (N=17)	3.84 (.11)	3.96 (.09)			
Condition 2: Non-inclusive Video- VERB (N=15)	3.94 (.11)	3.94 (.09)			
Condition 3: Targeted Video- Paralympic (N=17)	4.01 (.11)	4.04 (.09)			
<b>Intention to participate in PA (N=60)</b>	3.98 (.41)	3.96 (.38)	1.66 (.03)	0.16 (.006)	0.31 (.01)
Condition 1: Neutral Video - ParticipACTION (N=20)	3.95 (.36)	4.00 (.40)			
Condition 2: Non-inclusive Video - VERB (N=21)	4.05 (.42)	3.95 (.31)			
Condition 3: Targeted Video - Paralympic (N=19)	3.95 (.47)	3.92 (.45)			



### Message Preferences (Table 7).

Frequencies of preference were determined for each video to understand what messages the youth preferred. Overall, the youth preferred the Paralympic message the most, and ranked the ParticipACTION and VERB messages equally as least preferred. When examining message preference between genders, male YWD (N=41, 2 missing) preferred the Paralympic message most (N=25, 61%), and the ParticipACTION message least (N=19, 46.3%). Female YWD (N=17) similarly preferred the Paralympic message most (N=10, 58.8%), and the VERB message least (N=8, 47.1%).

Table 7. *Message Preferences*

Video	Most Preferred (Ranked “Best”) N (%)	No Preference (Ranked “Middle”) N (%)	Least Preferred (Ranked “Worst”) N (%)
ParticipACTION	7 (12.1%)	26 (44.8%)	25 (43.1%)
VERB	16 (27.6%)	17 (29.3%)	25 (43.1%)
Paralympic	35 (60.3%)	15 (25.9%)	8 (13.8%)

*Note: Two participants did not answer this portion of the survey; N=58*

### Message Evaluations (Table 8).

To examine possible differences in message evaluation variables (i.e., attention, relevance, believability, involvement, and attitudes) toward each PA message, a series of paired sample t-tests were calculated to compare message evaluations between the three video conditions (Table 8). In order to reduce the risk of type I error, a Bonferroni adjustment was used and a p-value of 0.01 was determined as the appropriate indicator of significance. There was a significant difference in message believability between ParticipACTION ( $M = 5.74$ ,  $SD = .91$ ) and VERB ( $M = 5.49$ ,  $SD = 1.12$ ),  $t(59) = 2.769$ ,  $p = .008$ , Cohen’s  $D = .03$ ) such that participants perceived the ParticipACTION message to be more believable than the VERB message. Further, there was a significant difference in message believability between VERB ( $M = 5.49$ ,  $SD = 1.12$ )

and Paralympic ( $M=5.75$ ,  $SD = 1.00$ ),  $t(59)=-2.72$ ,  $p=.009$ , Cohen's  $D = -0.02$ ) such that participants perceived the Paralympic message to be more believable than the VERB message.

Table 8. *Message Evaluation Comparisons Among Video Conditions*

	M (SD)				
	Message Relevance	Message Believability	Message Attention	Attitudes Toward the Message Content	Attitudes Toward the Video
ParticipACTION	5.19 (.74)	5.74* <sup>a</sup> (.91)	5.75 (.59)	5.73 (.86)	5.71 (.92)
VERB	5.15 (1.01)	5.49* <sup>a,b</sup> (1.12)	5.76 (.63)	5.64 (1.10)	5.69 (1.06)
Paralympic	5.36 (.76)	5.75* <sup>b</sup> (1.00)	5.83 (.63)	5.79 (.93)	5.83 (.97)

Notes:

a. significant difference ParticipACTION and VERB

b. significant difference between VERB and Paralympic

$df = 59$  for all video conditions and video evaluations

\* indicates a significance at the  $p < 0.01$  level as per Bonferroni adjustment

### **Predictors of Intention to Participate in Physical Activity (Tables 9 and 10).**

To examine if SIABM constructs predicted intention to participate in PA following message exposure, a linear regression analysis was calculated (Table 10). First, a multiple correlation was run to examine correlations among the variables at the univariate level. This was done to examine the possibility that some variables might be highly correlated with intentions to engage in PA post-viewing, or with each other, which could potentially cause collinearity within the multivariate analysis (Field, 2009). All variables except attitudes toward PA post-viewing were significantly correlated with intention at the  $p=.01$  level. To examine multivariate relationships, a linear regression was conducted using all variables and backwards approach. As suspected, due to high levels of correlation between variables (Table 9), there was evidence of high collinearity within the first regression model. The following variables were removed from the model due to high variance inflation factor (VIF) scores (i.e.,  $>5$ ) (Field, 2009): attitudes

toward the message content, attitudes toward the video, and message believability. Therefore, the final model included intention to participate in PA post-viewing as the dependent variable and the following independent variables: video condition, attitudes toward PA, social issue involvement, message relevance, and message attention. The final model explained 30.7% of the variance in intention ( $F(2,46)=12.337, p=.001$ ). The only significant predictor of intention to participate in PA post-viewing was message attention ( $\beta =.567; p=.001$ ).

Table 9. *Pearson Correlation Among Regression Variables*

Pearson Correlation									
Variable	Intention Post- Viewing	Attitudes Toward PA Post- Viewing	Social Issue Involve- ment	Video Condition	Message Relev- ance	Message Believa- bility	Message Attention	Attitudes Toward the Message Content	Attitudes Toward the Video
Intentions Post-Viewing	1.00	.19	.53**	-.002	.35**	.48**	.58**	.47**	.46**
Attitudes Toward PA Post-Viewing	.19	1.00	.39**	.09	.47**	.34*	.41**	.47**	.36**
Social Issue Involvement	.53**	.39**	1.00	.00	.45**	.82**	.74**	.87**	.83**
Video Condition	-.002	.09	.00	1.00	.25	.11	.009	.09	.10
Message Relevance	.35**	.47**	.45**	.25	1.00	.68**	.54**	.65**	.65**
Message Believability	.48**	.34*	.82**	.11	.68**	1.00	.78**	.93**	.93**
Message Attention	.57**	.41**	.74**	.009	.54**	.78**	1.00	.76**	.77**
Attitudes Toward the Message Content	.47**	.47**	.87**	.09	.65**	.93**	.76**	1.00	.94**
Attitudes Toward the Video	.46**	.36**	.83**	.10	.65**	.93**	.77**	.94**	1.00

\* indicates significant correlation at the  $p = 0.05$  level

\*\* indicates significant correlation at the  $p = 0.01$  level

Table 10. *Backward Regression Predicting Intention to Participate in Physical Activity Post-Message Viewing*

Model	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	Adjusted $R^2$
1					.283
Constant	2.11	.60		.001	
Attitudes Toward PA post-viewing	-.11	.16	-.10	.49	
Social Issue Involvement post-viewing	.13	.09	.25	.17	
Message Relevance	.04	.07	.08	.62	
Message Attention	.24	.12	.38	.06	
Video Condition	-.01	.06	-.02	.90	
2					.299
Constant	2.10	.12		.001	
Attitudes Toward PA post-viewing	-.11	.16	-.10	.48	
Social Issue Involvement post-viewing	.13	.09	.26	.16	
Message Attention	.237	.12	.38	.05*	
Message Relevance	.03	.07	.07	.63	
3					.311
Constant	2.07	.58		.001	
Social Issue Involvement post-viewing	.13	.09	.26	.15	
Message Attention	.26	.11	.41	.03*	
Attitudes Toward PA	-.09	.15	-.08	.56	
4					.321
Constant	1.84	.44		.000	
Message Attention	.24	.11	.39	.03*	
Social Issue Involvement post-viewing	.12	.09	.25	.17	
5					.307
Constant	1.91	.44		.000	
Message Attention	.35	.08	.57	.00**	

## **Discussion**

The primary purpose of this study was to examine the impact of PA messages on YWD's attitudes toward PA and intentions to participate in PA. The secondary purpose was to examine YWD's preferences and evaluations of various PA messages. This is the first known study to investigate the effects of PA messages among YWD. The research findings are discussed in relation to implications for future research and the development of effective PA messaging strategies for YWD.

### **Attitudes Toward Physical Activity and Intention to Participate in Physical Activity**

The first purpose of this study was to examine the effects of PA messages on attitudes toward PA and intention to participate in PA and to compare the effects of various PA messages on attitudes and intentions. Attitudes and intention work together as they influence each other. Attitudes act as an important precursor to engaging in a behaviour (Fishbein & Ajzen, 1975; Sheppard et al., 1988) as well as having the potential to influence one's intention or motivation (Ajzen, 1991). Both are important constructs within the SIABM as attitudes have the potential to influence intention to comply to the behaviour being advertised in the message (O'Cass & Griffin, 2006), while intention is a proximal determinant of carrying out the actual behaviour (Ajzen, 1991).

Attitudes toward PA predict intentions to participate in PA and actual behaviour among youth (Mummery, Spence, & Hudec, 2000; Hagger, Chatzisarantis, & Biddle, 2001; Chatzisarantis, Hagger, Biddle, & Smith, 2005; Graham, Sirard, & Neumark-Sztainer, 2011; Poobalan, Aucott, Clarke, & Smith, 2012). PA messaging campaigns targeting able-bodied youth have had success by targeting attitudes toward PA as well as behavioural intention and found that attitudes toward PA (Asbury et al., 2008; Mattson & Basu, 2010; Huhman, Bauman, &

Bowles, 2008; Huhman et al., 2005; Price et al., 2009) and intentions (Huhman, Bauman, & Bowles, 2008) to participate in PA increased after message viewing. This is the first known study to examine the effects of PA messages on the attitudes toward PA and intentions to engage in PA among YWD. Ultimately, the PA messages were not effective in changing participants' attitudes toward PA or intention to engage in PA.

Given that PA messages are meant to motivate and influence PA, they are best suited for individuals who a) have poor attitudes toward PA, b) have low intentions to participate in PA, and c) are not already engaging in high levels of PA (O'Cass & Griffin, 2006; Huhman et al., 2007; Wong, Huhman, Neitzler, Asbury, Bretthauer-Mueller, McCarthy, et al., 2004; Walsh, et al., 1993). Therefore, one possible explanation for the lack of effects on attitudes toward PA and intentions to participate in PA in the current study were the high levels of baseline attitudes, intentions, and PA behaviours within the sample. These baseline sample characteristics likely presented a ceiling effect such that there were little or no room for improvement in attitudes and intentions regardless of the PA message characteristics. Considering that attitudes predict intentions (O'Cass & Griffin, 2006) and intentions are an important predictor of behaviour (Fishbein & Ajzen, 1975; O'Cass & Griffin, 2006), PA messages are most likely to be effective in a sample with low attitudes and intentions. Previous messaging research has seen success in changing attitudes and intention toward PA (Huhman, Bauman, & Bowles, 2008; Huhman et al., 2005; Price et al., 2009) but these changes may have been observed because the samples had lower baseline levels of attitudes and intentions compared to the current sample. PA campaigns could be more valuable and beneficial to YWD who have low attitudes toward PA and intentions to participate in PA. Therefore, it would be beneficial to explore the effects of PA messages on attitudes and intentions toward PA among a sample of YWD who have lower attitudes and

intentions toward PA, and lower levels of PA behaviour compared to the current sample. Future research should consider using a purposeful sampling method (Patton, 2002) to select YWD who have low levels of PA, and low baseline attitudes and intentions toward PA. Future research should also consider how PA messages influence actual PA behaviour and other social cognitive factors among YWD as only attitudes and intentions were assessed in the current study. While attitudes and intentions are important predictors of behaviour (Ajzen, 1991; O’Cass & Griffin, 2006), it would be interesting to consider the effects of PA messages on YWD PA behaviour or other related social cognitions such as planning or self-monitoring. For example, it is possible that the PA messages could work to prime individuals with already high attitudes and intentions to engage in PA behaviour. Similarly, PA messages could work to prime regulatory behaviours that mediate the translation of PA intentions into PA behaviour even among people with already high attitudes and intentions. For example, an individual with high baseline attitudes and intentions may view a message and feel motivated to engage in self-regulatory behaviour (e.g., planning and self-monitoring) to support subsequent PA behaviour.

The null effects were observed across all video conditions. Attitudes toward PA and intentions to engage in PA did not change significantly from baseline to post-viewing, regardless of which video the YWD observed. Theoretically, messages that are targeted to an audience should be most effective in changing attitudes toward PA and intentions to engage in PA (Asbury et al., 2008; Mattson & Basu, 2010). Previous messaging research has demonstrated targeted messages to be most effective (Huhman, et al., 2007; Huhman, et al., 2008; Huhman et al., 2009; Price et al., 2009) and as such it was expected that the targeted message would be more effective than the other two messages in changing attitudes and intentions in the current study. However, there was no evidence to support prior research regarding the effectiveness of targeted



messages. The null findings among the three video conditions was likely due to a ceiling effect as the sample had high attitudes and intentions at baseline. It is also plausible that the specific PA messages used for the study could have influenced the null effects of the messages on attitudes and intentions. To elaborate, it is possible that if different messages were chosen that specifically and explicitly target attitudes and intentions, changes may have been observed. Therefore, future research is encouraged to understand not only the effectiveness of different PA messages but what aspects and mechanisms of messages would be most effective to influence attitudes and intentions, and ultimately PA behaviour.

### **Preferences and Message Evaluations**

The second purpose of the study was to examine differences in attention, relevance, believability, involvement, and attitudes toward various PA messages as well as understand message preferences. Although none of the messages were effective in changing attitudes toward PA or intentions to engage in PA, there were some differences regarding the YWD's preferences and message evaluations. The targeted Paralympic message had the highest preference ranking. In addition, the YWD found the Paralympic message to be more believable than the VERB message, which was non-inclusive. The participants' preference and evaluations of believability for the Paralympic message are likely a reflection of the targeted nature of the message. Compared to the other two messages (i.e., VERB and ParticipACTION), the Paralympic message was clearly targeted to YWD, as it depicted only YWD engaging in sport and PA. Targeted PA messages are more effective compared to non-targeted PA messages (Huhman, Bowman, Bowles, 2008; Langille et al., 2011; Huhman et al., 2005; Faulkner, Kwan, & MacNeill, 2011; Hawkins et al., 2008; Latimer, Brawley, & Bassett, 2010) as they are perceived as more believable due to increased personal relevance (O'Cass & Griffin, 2006). Believability

focuses on the message content and is characterized by how truthful and acceptable the message is perceived to be by the audience (Beltramini, 1982). According to the application of the SIABM (O’Cass & Griffin, 2006), if the content in the VERB message was perceived as less acceptable and truthful than the targeted Paralympic message, then the participants would deem it to be less believable. Participants may have perceived the VERB video as particularly unbelievable because it depicts only able-bodied youth engaging in PA. The findings regarding YWD preferences and perceptions of believability are important in understanding that some PA campaign messages are not inclusive of YWD. These findings align with previous research findings regarding able-bodied youths’ evaluations of PA messages and their preference for messages that are targeted (Faulkner, Kwan, & MacNeill, 2011; Huhman et al., 2005; Price et al., 2009; Huhman, Bowman & Bowles, 2008; Aeffect, 2001; CDCa). Therefore, these results suggest that just like able-bodied youth, YWD prefer targeted messages as well, but further research is needed to understand how the messaging preferences of YWD differ from able-bodied youth.

Although the targeted Paralympic message was preferred and was evaluated as more believable than the other messages, it was still ineffective at changing the YWD’s attitudes toward PA and intentions to participate in PA likely because of the high baseline attitudes and intentions scores. According to the SIABM, message believability directly impacts attitudes and intention (O’Cass & Griffin, 2006) but previous research has found that message believability does not always correlate with attitudes and intentions (Berry, Jones, McLeod, & Spence, 2011). The absence of a correlation between believability with attitudes and intentions from past research (Berry, et al., 2011) can be a contributing factor in understanding why in the current study there were significant differences in believability between the messages, but no differential

effects of the messages on attitudes towards PA and intentions to participate in PA. There is a need for further research to understand the relationship between evaluations such as message believability and outcomes like attitudes and intentions toward PA. Nonetheless, these results address an important gap in messaging research by providing insight regarding the preferences and evaluations of PA messages among YWD. These preliminary results suggest that there may be value in using targeted messages for YWD that depict images of people with disabilities engaging in PA. Although there is no known research to examine the value of targeted messages among YWD per se, research conducted among parents of YWD suggests that there is a preference and desire for targeted messages and PA messages that are inclusive of YWD (Bassett-Gunter et al., 2017). The results of the current study suggest targeted and inclusive messages may be desired among YWD as well. Future research should examine the specific effects of targeted versus non-targeted PA messages among inactive YWD who have lower attitudes toward PA and intentions to participate in PA compared to the current sample. Pragmatically, organizations that wish to promote PA for YWD should consider using targeted PA messages where possible, so that YWD evaluate the messages as believable.

It was interesting that although the YWD evaluated the targeted Paralympic message as more believable than the non-inclusive message, there were no significant differences in other evaluations such as attention or attitudes towards the message. According to the SIABM (O’Cass & Griffin, 2006), these additional message evaluation variables are related to the effectiveness of a given message. For example, if an audience has more favourable attitudes toward one message compared to another message, then the more favourable message would be expected to have a greater effect on outcomes like attitudes and intentions toward PA. The lack of differences in message evaluation (with the exception of believability) is consistent with the lack of group

differences in video effects. Unfortunately, the lack of variability in message evaluations and the lack of effects of the messages on attitudes and intentions toward PA, make it difficult to make any inferences regarding the role of message evaluation characteristics in informing the development of PA messages targeting YWD. More research is necessary to understand how to create PA messages that optimize evaluation components related to message effectiveness. According to the SIABM (O’Cass & Griffin, 2006), messages that elicit high attention, believability, attitudes, and involvement will be optimally effective in changing predictors of PA among YWD. Future research that experimentally manipulates these aspects of PA messages targeting YWD could be valuable in informing the role of various message evaluation components in optimizing PA message effectiveness.

### **Predictors of Intention to Participate in Physical Activity Post-Viewing**

The third purpose of this study was to determine if SIABM constructs predict intention to participate in PA post message viewing. Attention paid to the message was the only significant predictor of intention to participate in PA. This observation suggests that those who paid more attention to the messages had greater intentions to participate in PA. Consistent with the SIABM (O’Cass & Griffin, 2006), message attention is a predictor of intention and plays an important role in the pathway to message effectiveness. Attention to a message it is the first step in cognitive processing (Petty & Cacioppo, 1979; Greenwald & Leavitt, 1984) and a key predictor in engaging in PA following message exposure (Berry et al., 2014). It has been suggested that developing strategies that garner the attention and interest of YWD should be of focus for PA promotional campaigns (Gorter et al., 2016). Creating messages that are targeted to the needs of the audience have been successful at influencing attention paid to a message resulting increased cognitive processing (Hawkins et al., 2008; Asbury et al., 2008; Aeffect, 2000; Aeffect, 2001;

CDCa). Attention did not significantly differ across message conditions (i.e., targeted or non-targeted) in the current study. The measure of attention used may not have been sensitive enough to detect differences in attention between different PA videos. More sensitive tools such as biometric measures of attention may provide further insight into the variability in attention for various PA messages and the relationship between attention and intention. There is value in further understanding how to optimize attention through strategies such as targeting. PA campaigns should work to use messages that attract the attention and interest of YWD. More research is needed to understand the role of attention on intention to participate in PA among YWD.

Individuals who consider themselves to be physically active or are motivated to engage in PA may pay more attention to PA related messages (Berry, 2006; Calitri, Lowe, Eves, & Bennett, 2009). In the current study, the directionality of the relationship between attention to the message and intention is unclear. That is, was attention to the message responsible for greater intentions to engage in PA post-viewing, or were YWD with higher intentions more motivated to pay attention to the message? Future research is necessary to understand the role of attention by comparing attention levels between YWD who have low intentions to participate in PA and those who have high intentions to participate in PA. Nonetheless, the results of this study provide value in understanding that attention and intention post-viewing have an important relationship among YWD.

Attention is related to other variables that have the potential to influence intention as well. For example, attention is related to believability (Cacioppo et al., 1986) which is also an important variable in the SIABM which explains that the more attention paid to a message, the more believable it is perceived to be (O’Cass & Griffin, 2006). Further, attention has a reciprocal

relationship with social issue involvement (O’Cass & Griffin, 2006), and social issue involvement has the potential to influence attitudes toward the desired behaviour (O’Cass & Griffin, 2006). Interestingly, attention was highly correlated with both believability and social issue involvement. The correlations among these variables can point to indications of how paying attention to a message can be related to other variables within the SIABM that influence intention. While this study is the first of its kind to examine PA messages and YWD, future research is encouraged to examine how SIABM variables can influence intention to participate in PA by examining how SIABM variables influence intentions after viewing different PA messages. This could point to indications of what types of messages work best to elicit higher scores in attention, believability, attitudes, and social issue involvement which is theorized to influence intentions to participate in PA as explained by the SIABM (O’Cass & Griffin, 2006).

### **Gender Differences in Intention to Participate in Physical Activity**

Girls had higher intentions to participate in PA and higher PA levels compared to boys within this study (Table 3). This finding was interesting given that among able-bodied children, girls tend to have lower intentions to participate in PA (Martin, Oliver, & McCaughtry, 2007) and engage in less PA (Tudor-Locke, Ainsworth, Adair, Du, & Popkin, 2003; Wang, Chen, & Zhuang, 2013; Belcher, Berrigan, Dodd, Emken, Chou, & Spruijt-Metz, 2010; Lee & Trost, 2006) compared to boys. Further, among youth with disabilities, it has been reported that girls spend less time engaging in total PA and MVPA compared to boys, but these differences were not deemed significant (Arbour-Nicitopoulos, Bassett-Gunter, Leo, Sharma, Olds, Latimer-Cheung, & Martin-Ginis, in progress). There is a need for further research to examine possible differences in intentions to participate in PA between boys and girls with physical disabilities. Should this observation be replicated among a larger sample of YWD, with greater variability in

intentions to participate in PA, there could be implications for the development of PA messages targeting PA. For example, there may be value in creating messages that target boys and girls uniquely, or a need to understand factors related to message effects among boys versus girls.

### **Theoretical Connections**

The SIABM (O’Cass & Griffin, 2006) informs an understanding of the relationship between message evaluations and perceptions in relation to one’s intentions to comply to the target behaviour. It has been used in various campaigns to evaluate a wide variety of health behaviour messages (Mattson & Basu, 2010; O’Cass & Griffin, 2006). Considering that this is the first known study to assess the effects of messages on YWD, the SIABM seemed to be a fitting theoretical choice based on how it has been used in previous research. Unfortunately, the null findings with regard to attitudes toward PA and intention to participate in PA do not align with the theory of the SIABM. The SIABM theorizes that higher attitudes after message viewing predicts higher intentions to comply with the message being advertised (O’Cass & Griffin, 2006), but the YWD’s attitudes toward PA as well as intention to participate in PA did not change significantly after message viewing. Differences in believability evaluations among the messages point to indications of effective messages and also highlight the important of believability in messaging, which the SIABM theorizes as an important variable in predicting intentions to perform a behaviour (O’Cass & Griffin, 2006). Furthermore, attention paid to the message acted as the only significant predictor of intention post-viewing. Not only is attention the first step to cognitively processing a message (Petty & Cacioppo, 1979), attention paid to a message positively influence how believable the message is perceived to be (O’Cass & Griffin, 2006). These results highlight the relationships between variables theorized and depicted by the

SIABM, but more research is warranted to establish whether the SIABM can be considered a good fit for YWD messaging research.

### **Pragmatic Connections**

The PA messages employed in the current study were not effective at enhancing attitudes toward PA or intentions to participate in PA among YWD, regardless of the type of video. One could conclude that the use of PA messages to motivate PA among YWD is inappropriate. However, given previous research regarding the value of PA messages in general (Latimer, Brawley, Bassett, 2010; Mattson & Basu, 2010) and among able-bodied youth (Huhman et al., 2007; Price et al., 2009; Potter et al., 2008), and the call for strategies to create targeted messages for YWD (Bassett-Gunter et al., 2017; Gorter et al., 2016), it is important to consider alternative conclusions. Given that the sample included highly active YWD with positive baseline attitudes toward PA and intentions to participate in PA, there is likely value in further research to explore the effects of messages in a more heterogeneous sample that includes YWD who are inactive and with low motivation for PA. There were observed differences in preference and believability of the various messages. Many PA messages are not inclusive of YWD and there may be value in using targeted messages for YWD, or at a minimum are inclusive of YWD. It has been suggested that PA messages should work to garner the attention of YWD (Gorter et al., 2016). In the current study, attention was associated with intention to engage in PA. However, the directionality of that relationship is unknown and warrants further exploration. Therefore, there is value in attracting the attention of YWD through messaging, but even more so, there is a need for understanding how to do so. The findings of this study begin to point to nuances of creating PA messages for YWD, but more research is required.



## **Limitations and Future Directions**

This study sought to explore the effects of existing PA messages on YWD's attitudes toward PA and intentions to participate in PA. Despite the strengths of this study, there are some limitations that merit discussion. First, the study did not group utilize a control group. Future studies should employ a no PA message control group so observations following message exposure can be compared to a no-message control group. Second, the study sample was small, which limited power to detect possible interaction effects or other small effect sizes. Third, the YWD who participated in the study generally had high baseline attitudes toward PA and intention to participate in PA as well as having high PA rates. Therefore, the generalizability of the results is limited to YWD who are physically active and have high attitudes toward PA and intentions to participate in PA. Fourth, the sample population used in this study only included youth with physical disabilities. Therefore, conclusions drawn from the results of this study may not be generalizable to youth with other types of disabilities. Fifth, within the demographic questionnaire, the participants were asked to self-report their disability and provide an explanation. The self-report nature of the demographic survey could have limited the reliability of the study and results. Finally, the messages used in this thesis were gathered from various past and present PA campaigns. While the researchers were mindful to choose PA messages that were intended for a youth audience and clearly promoted PA, it was impossible to control the content (e.g., what and how messages were presented) across the conditions. Further, participants may have seen these messages prior to study participation, which could have biased or impacted the effects of the messages within the context of the study. There may be value from an internal validity perspective to use regulated messages developed by researchers in future research. However, the external validity of such messages is often low and subject to criticism.

## **Conclusion**

This thesis was the first known study to examine the effects of PA messages on YWD's attitudes toward PA and intentions to participate in PA. The PA messages did not significantly change attitudes and intention from baseline to post-viewing. However, the targeted message was preferred by the YWD and perceived to be most believable compared to the non-inclusive message. Further, attention paid to a message was the only significant predictor of intention post-viewing the messages. PA campaigns should consider creating messages that are targeted for YWD who have low motivation to engage in PA and work to attract the attention of YWD.

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## Appendix

### Appendix A – Web and Poster Advertisement



**ARE YOU OR YOUR CHILD BETWEEN THE  
AGES OF 10-21 AND HAVE A PHYSICAL  
DISABILITY? IF SO THEN WE WOULD LIKE  
TO HEAR FROM YOU!**

**The School of Kinesiology and Health Science at York University is conducting research regarding the promotion of physical activity. We would like to hear from youth living with physical disabilities.**

**This study involves completing one online questionnaire. Total participation time is approximately 1 hour. Participants will receive a \$20 gift card as a token of appreciation.**

**Eligible participants** must be between **10 and 21** years of age and have a **physical disability**.

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## **Appendix B – Media Message Commercial Selection Links**

### Videos

ParticipACTION- Make Room for Play:

<https://www.youtube.com/watch?v=RrI8ktR9zBw>

VERB- It's What You Do:

<https://www.youtube.com/watch?v=sxcsKE1SS4Y>

Paralympic - It's More Than Sport:

<https://www.youtube.com/watch?v=eWRAkWI9mLw>

## Appendix C – Baseline Questionnaire

### Baseline Questionnaires

#### Consent

Do you consent to participate in this study?

- Yes
- No

#### Demographic Questionnaire

Please provide the following information about yourself.

1. Are you male or female?

- Male
- Female
- Other
- Prefer not to answer

2. What is your date of birth?

Day \_\_\_\_\_ Month \_\_\_\_\_ Year \_\_\_\_\_

4. To create a participant ID please enter the first three letters of your last name and the last four digits of your home phone number.

*ie. Last name: Smith home phone number: (613) 555-4490  
participant ID: S M I 4 4 9 0*

Please enter your participant ID here: \_ \_ \_ \_ \_ .

An Aboriginal Person is a North American Indian, Métis or Inuit, or a member of a North American First Nation. An Aboriginal Person may be a treaty status or a non-status, registered or non-registered Indian.

8. Are you an Aboriginal Person?

- No
- Yes

10. Please describe your physical disability.

- Comment box

### Measure of Physical Activity Behaviour

In answering the following questions please keep in mind that,

Moderate-intensity activities will cause you to sweat a little and breathe harder, you should still be able to talk, but not sing.

Vigorous-intensity activities will cause you to sweat and be out of breath, it will be almost impossible to carry on a conversation.

These physical activities can take place while playing sports, doing school/work activities, playing with friends, or walking to school/work.

1. *Over the past seven days, on how many of those days were you physically active for at least 60 minutes per day?*

\_\_\_ Days            OR            None

2. *Over the last seven days, on how many of those days did you do sports, fitness, or recreational physical activity?*

\_\_\_ Days            OR            None

3. *In the last seven days, how much time in total did you spend doing moderate and vigorous activities?*

\_\_\_ Hours \_\_\_ Minutes

The following questions will ask you about the time you spent engaging in mild, moderate, and heavy intensity LTPA in the last 7 days. Leisure Time Physical Activity (LTPA) is physical activity that you choose to do during your free time, such as exercising, playing sports, gardening, and taking the dog for a walk (necessary physical activities such as physiotherapy, grocery shopping, pushing/wheeling for transportation are not considered LTPA).

Please refer to the intensity chart (pictured below) for descriptions of what mild, moderate and heavy intensity LTPA feel like.



	NOTHING AT ALL	MILD	MODERATE	HEAVY
<b>How hard are you working?</b>	<ul style="list-style-type: none"> <li>Includes activities that even when you are doing them, you do not feel like you are working at all.</li> </ul>	<ul style="list-style-type: none"> <li>Includes physical activities that require you to do very light work. You should feel like you are working a little bit but overall you shouldn't find yourself working too hard</li> </ul>	<ul style="list-style-type: none"> <li>Includes physical activities that require some physical effort. You should feel like you are working somewhat hard but you should feel like you can keep going for a long time.</li> </ul>	<ul style="list-style-type: none"> <li>Includes physical activities that require a lot of physical effort. You should feel like you are working really hard (almost at your maximum) and can only do the activity for a short time before getting tired. These activities can be exhausting</li> </ul>
<b>How does your body feel?</b>				
Breathing & Heart rate	Everything is normal	<ul style="list-style-type: none"> <li>Stays normal or is only a little bit harder and/or faster than normal</li> </ul>	<ul style="list-style-type: none"> <li>Noticeably harder and faster than normal but <u>NOT</u> extremely hard or fast</li> </ul>	<ul style="list-style-type: none"> <li>Fairly hard and much faster than normal.</li> </ul>
Muscles		<ul style="list-style-type: none"> <li>Feel loose, warmed-up and relaxed. Feel normal temperature or a little bit warmer and not tired at all</li> </ul>	<ul style="list-style-type: none"> <li>Feel pumped and worked. Feel warmer than normal and starting to get tired after awhile.</li> </ul>	<ul style="list-style-type: none"> <li>Burn and feel tight and tense. Feel a lot warmer than normal and feel tired.</li> </ul>
Skin		<ul style="list-style-type: none"> <li>Normal temperature or is only a little bit warmer and not sweaty</li> </ul>	<ul style="list-style-type: none"> <li>A little bit warmer than normal and might be a little sweaty</li> </ul>	<ul style="list-style-type: none"> <li>Much warmer than normal and might be sweaty</li> </ul>
Mind		<ul style="list-style-type: none"> <li>You might feel very alert. Has no effect on concentration</li> </ul>	<ul style="list-style-type: none"> <li>Require some concentration to complete</li> </ul>	<ul style="list-style-type: none"> <li>Requires a lot of concentration (almost full) to complete</li> </ul>

1. Mild intensity LTPA requires very light physical effort; mild intensity activities make you feel like you are working a little bit, but you can keep doing them for a long time without getting tired...

a) During the last 7 days, on how many days did you do mild intensity LTPA?

\_\_\_\_ Days            OR            None

b) On those days, how many minutes did you usually spend doing mild intensity LTPA?

\_\_\_\_ Hours \_\_\_\_ Minutes

2. Moderate intensity LTPA requires some physical effort; moderate intensity activities make you feel like you are working somewhat hard, but you can keep doing them for a while without getting tired...

a) During the last 7 days, on how many days did you do moderate intensity LTPA?

\_\_\_\_ Days            OR            None

b) On those days, how many minutes did you usually spend doing moderate intensity LTPA?

\_\_\_\_ Hours \_\_\_\_ Minutes

3. Heavy intensity LTPA requires a lot of physical effort. Heavy intensity activities make you feel like you are working really hard, almost at your maximum. You cannot do these activities for very long without getting tired. These activities may be exhausting.

a) *During the last 7 days, on how many days did you do heavy intensity LTPA?*

\_\_\_ Days            OR            None

b) *On those days, how many minutes did you usually spend doing heavy intensity LTPA?*

\_\_\_ Hours \_\_\_ Minutes

### Attitudes About Physical Activity

If I did 60 minutes of physical activity on most days...

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
It would keep me in shape	1	2	3	4	5
It would be boring	1	2	3	4	5
It would be fun	1	2	3	4	5
It would help me make new friends	1	2	3	4	5
It would help me spend more time with my friends	1	2	3	4	5
It would make me feel good about myself	1	2	3	4	5
It would keep me from doing other things I like better	1	2	3	4	5

If I were to engage in 60 minutes of physical activity daily, it would...

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Help me feel normal	1	2	3	4	5
Put me at risk for injury and pain	1	2	3	4	5

### Intention to Participate in PA

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I intend to participate in at least 60-minutes of physical activity each day.	1	2	3	4	5
I will try to participate in physical activity for at least 60-minutes per day.	1	2	3	4	5

### Social Issue Involvement

Please rank the issue of increasing your physical activity as...

Unimportant						Important
1	2	3	4	5	6	7

Of no concern to me						Of concern to me
1	2	3	4	5	6	7

Irrelevant						Relevant
1	2	3	4	5	6	7

Means nothing to me						Means a lot to me
1	2	3	4	5	6	7

Doesn't matter to me						Matters to me
1	2	3	4	5	6	7

Boring						Interesting
1	2	3	4	5	6	7

Insignificant						Significant
1	2	3	4	5	6	7

Not needed						Needed
1	2	3	4	5	6	7

## Appendix D – Immediately Post-Viewing Questionnaire

### Immediately Post-Viewing Questionnaire

#### Video Viewing

1. I have watched the video without any technical difficulty.
  - Yes
  - No
  
2. If you did experience technical difficulty, please explain.
  - Comment box
  
3. Have you seen this video before on television, social media, or the internet?
  - Yes
  - No

#### Message Relevance

Keeping in mind the video you just viewed, please answer the following questions.

How relevant was the information in the video to you?

Not relevant						Relevant
1	2	3	4	5	6	7

How useful was the information in the video to you?

Not useful						Useful
1	2	3	4	5	6	7

Please indicate your agreement with the following statements.

The video seemed to be written personally for me.

Strongly Disagree	Disagree	Disagree somewhat	Neutral	Agree somewhat	Agree	Strongly Agree
1	2	3	4	5	6	7

The video was relevant to my situation.

Strongly Disagree	Disagree	Disagree somewhat	Neutral	Agree somewhat	Agree	Strongly Agree
1	2	3	4	5	6	7

The video was mostly general information that wasn't applicable to me.

Strongly Disagree	Disagree	Disagree somewhat	Neutral	Agree somewhat	Agree	Strongly Agree
1	2	3	4	5	6	7

The video was not customized at all.

Strongly Disagree	Disagree	Disagree somewhat	Neutral	Agree somewhat	Agree	Strongly Agree
1	2	3	4	5	6	7

### Message Believability

To what extent do you believe the physical activity commercial was...

Not informative						Informative
1	2	3	4	5	6	7

Untrustworthy						Trustworthy
1	2	3	4	5	6	7

Inaccurate						Accurate
1	2	3	4	5	6	7

Unconvincing						Convincing
1	2	3	4	5	6	7

Unbelievable						Believable
1	2	3	4	5	6	7

### Attention Paid to the Message

Keeping the video you just viewed in mind, please answer the following questions.

How much attention did you pay to the video?

None						Very Much
1	2	3	4	5	6	7

How much did you concentrate on the video?

None						Very Much
1	2	3	4	5	6	7

How involved were you with the video?

None						Very Much
1	2	3	4	5	6	7

How much thought did you put into evaluating the video?

None						Very Much
1	2	3	4	5	6	7

### Attitudes Towards the Message

The next set of questions will ask you what you think about the message of the video you just viewed.

The message in the commercial was...

Boring						Interesting
1	2	3	4	5	6	7

Not attention-getting						Attention-getting
1	2	3	4	5	6	7

Bad						Good
1	2	3	4	5	6	7

Not fun						Fun
1	2	3	4	5	6	7

I...

Do not like it						Like it
1	2	3	4	5	6	7

### Attitudes Towards the Advertisement

The next set of questions will ask you what you think of the video you just viewed as a whole.

I would describe the advertisement as...

Bad						Good
1	2	3	4	5	6	7

Unpleasant						Pleasant
------------	--	--	--	--	--	----------

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Low-Quality						High-Quality
1	2	3	4	5	6	7

Not desirable						Desirable
1	2	3	4	5	6	7

Unfavourable						Favourable
1	2	3	4	5	6	7

I...

Do not like it						Like it
1	2	3	4	5	6	7

### Attitudes About Physical Activity

If I did 60 minutes of physical activity on most days...

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
It would keep me in shape	1	2	3	4	5
It would be boring	1	2	3	4	5
It would be fun	1	2	3	4	5
It would help me make new friends	1	2	3	4	5
It would help me spend more time with my friends	1	2	3	4	5
It would make me feel good about myself	1	2	3	4	5
It would keep me from doing other things I like better	1	2	3	4	5

If I were to engage in 60 minutes of physical activity daily, it would...

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Helps me feel a sense of normalcy	1	2	3	4	5
Put me at risk for injury and	1	2	3	4	5

pain					
------	--	--	--	--	--

### Intention to Participate in PA

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I intend to participate in 60-minutes of physically activity each day in the next two weeks	1	2	3	4	5
In the next two weeks, I will try to participate in physical activity 60-minutes per day.	1	2	3	4	5

### Social Issue Involvement

Please rank the issue of increasing your physical activity as...

Unimportant						Important
1	2	3	4	5	6	7

Of no concern to me						Of concern to me
1	2	3	4	5	6	7

Irrelevant						Relevant
1	2	3	4	5	6	7

Means nothing to me						Means a lot to me
1	2	3	4	5	6	7

Doesn't matter to me						Matters to me
1	2	3	4	5	6	7

Boring						Interesting
1	2	3	4	5	6	7

Insignificant						Significant
---------------	--	--	--	--	--	-------------



1	2	3	4	5	6	7
---	---	---	---	---	---	---

Not needed						Needed
1	2	3	4	5	6	7

## Appendix E – Consent Forms

### Youth Participant Consent Form



**Date:** November 2017

**Study Name:** *Physical activity – What do youth with physical disabilities think?*

**Researchers:**

**Purpose of the Research:** The purpose of this research project is to evaluate various physical activity media message targeting youth. We are interested in understanding how various commercials impact that thoughts and feelings of youth with physical disabilities regarding physical activity.

**What you will be asked to do in the research:** You will be asked to complete a series of questions regarding their involvement in physical activity. Next, you will be asked to view a short video targeting youth physical activity. The videos used in the study are existing commercials that are publically available (e.g., seen on TV). After viewing the video, you will be asked to complete another series of questions regarding the commercial and your thoughts and feelings. Then you will be asked to view and evaluate another series of videos. Your participation for the survey will take approximately 30-45 minutes. You will receive a \$20 gift card for their participation from either: Indigo, Tim Hortons, or Amazon.

**The survey will:**

- Take place over the course on sitting, approximately 30-45 mins
- Ask your son or daughter to a) evaluate physical activity commercial messages targeting youth b) provide responses about their thoughts and feelings regarding physical activity as well as the commercials viewed.

**Risks and Discomforts:** We do not foresee any risks or discomfort from your participation in the research.

**Benefits of the Research and Benefits to You:** There are no known or direct benefits to you as the participant.

**Voluntary Participation:** Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with York University either now, or in the future.

**Withdrawal from the Study:** You can stop participating in the study at any time, for any reason, if you so decide. If you decide to stop participating, you will still be eligible to receive the promised pay for agreeing to be in the project. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, York University, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

**Confidentiality:**

**The survey is confidential**

- The survey is completely confidential and poses no risk to your child
- Each child will have a unique ID and password and he or she will not be identified by name; only the university researchers will have access to individual surveys
- Once the survey is complete is it saved on a password protected account on the survey collection software “Survey Monkey” (www.surveymonkey.com)
- Results are published in group format; no individual results are shared
- Information will be stored in locked computer files for up to 7 years
- After 7 years, data will be destroyed.
- These computers are located in a secure research lab at York University.

The researcher(s) acknowledge that the host of the online survey (e.g., Qualtrix, Survey Monkey etc.) may automatically collect participant data without their knowledge (i.e., IP addresses.) Although this information may be provided or made accessible to the researchers, it will not be used or saved without participant’s consent on the researchers’ system. Because this project employs e-based collection techniques, data may be subject to access by third parties as a result of various security legislation now in place in many countries and thus the confidentiality and privacy of data cannot be guaranteed during web-based transmission.

Confidentiality will be provided to the fullest extent possible by law.

**Questions about the Research:**

This research has received ethics review and approval by the Human Participants Review Sub-Committee, York University’s Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University. Thank you for taking the time to read this information. To view further project details and the youth questionnaires please contact:

**Legal Rights and Signatures:** I consent to participate in *Physical activity – What do youth with physical disabilities think?* conducted by Victoria Larocca. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. By clicking the “I consent” below, I indicate my consent.

**Click here to indicate your consent:**  I consent

**Parent Consent Form (If youth is under 16 years of age)**



***Parent Information Letter Consent Form***

Date: November 2017

Dear Parent(s) or Guardian(s),

Your child has expressed interest in participating in a study titled “*Physical activity – What do youth with physical disabilities think?*” conducted by Victoria Larocca under the supervision of Rebecca Bassett-Gunter at York University. Study participation will help us gather information about current physical activity messages and how they can be improved to meet the needs and preferences of youth with disabilities.

**Details about the study:**

- This study is a survey for youth between the ages of 14 and 21 with a physical disability.
- Youth will complete the survey via an online survey link.
- The survey asks youth about their feelings and attitudes towards physical activity commercials.
- Your child can refuse to take part in the survey at any time, with no penalty. Youth will not be part of the survey if a parent decides they should not do so OR if the youth does not agree to take part. Youth can change their minds, stop participating or not answer questions if they choose.
- There are no known or anticipated risks from participation in this study.
- You can see a copy of the survey questions by contacting Victoria Larocca

**What will my child be asked to do?**

Your child will be asked to complete a series of questions regarding their involvement in physical activity. Next, they will be asked to view a short video targeting youth physical activity. The videos used in the study are existing commercials that are publically available (e.g., seen on TV). After viewing the video, your child will be asked to complete another series of questions regarding the commercial and his or her thoughts and feelings. Then your child will be asked to view and evaluate another series of videos. Your child’s participation for the survey will take approximately 30-45 minutes. Your child will receive a \$20 gift card for their participation from either: Indigo, Tim Hortons, or Amazon.

**The survey will:**

- Take place over the course on sitting, approximately 30-45 mins
- Ask your son or daughter to a) evaluate physical activity commercial messages targeting youth b) provide responses about their thoughts and feelings regarding physical activity as well as the commercials viewed.

### **The survey is confidential**

- The survey is completely confidential and poses no risk to your child
- Each child will have a unique ID and password and he or she will not be identified by name; only the university researchers will have access to individual surveys
- Once the survey is complete it is saved on a password protected account on the survey collection software “Survey Monkey” (www.surveymonkey.com)
- Results are published in group format; no individual results are shared
- Information will be stored in locked computer files for up to 7 years
- After 7 years, data will be destroyed.
- These computers are located in a secure research lab at York University.

The researcher(s) acknowledge that the host of the online survey (e.g., Qualtrix, Survey Monkey etc.) may automatically collect participant data without their knowledge (i.e., IP addresses.) Although this information may be provided or made accessible to the researchers, it will not be used or saved without participant’s consent on the researchers’ system. Because this project employs e-based collection techniques, data may be subject to access by third parties as a result of various security legislation now in place in many countries and thus the confidentiality and privacy of data cannot be guaranteed during web-based transmission.

Confidentiality will be provided to the fullest extent possible by law.

### **What if you change your mind about your child’s participation?**

- The final decision to participate in this survey must be made by the youth and the parent(s) or guardian(s). Your participation is voluntary and there is no penalty if your child does not participate.
- If you and your child agree now to participate, but either of you change your minds later, your child can be withdrawn from the survey at any time, before submitting responses.

### **Permission/Consent**

Parents/Guardians can decide whether or not they want their child to be to be part of the study. If a child is the legal age to consent to research, they have the right to decide about the survey on their own. In Ontario, the legal age to consent is 16. If your child is under the age of 16 and you wish to provide consent for him/her to participate in this survey, please complete the following information and provide your electronic consent below.

**Legal Rights and Signatures:** I, consent to my child \_\_\_\_\_’s participation in the research survey “*Physical activity – What do youth with physical disabilities think?*” conducted by Victoria Larocca. I have understood the nature of this project and wish for my child to participate. I am not waiving any of my legal rights by consenting within this form. Clicking “I consent” below indicates my consent.

**Click here to indicate your consent:**  I consent

### **Contact Information**

This research has received ethics review and approval by the Human Participants Review Subcommittee, York University’s Ethics Review Board and conforms to the standards of the

Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University. Thank you for taking the time to read this information. To view further project details and the youth questionnaires please contact Victoria Laroocca.

**Appendix F – Mean, Standard Deviations, Skewness, and Kurtosis of Variables**

Variable	N	M (SD)	Skewness	Kurtosis
Attitudes PA Baseline	60	3.88 (.45)	-.14	.17
Intention PA Baseline	60	3.98 (.41)	.44	1.49
Social Issue Involvement Baseline	60	5.84 (.82)	-1.49	1.24
Attitudes PA Post-Viewing	49	3.98 (.35)	-.94	1.32
Intention PA Post-Viewing	60	3.96 (.38)	.61	1.58
Message Relevance - ParticipACTION	60	5.19 (.74)	-.86	1.14
Message Believability - ParticipACTION	60	5.74 (.91)	-1.33	1.11
Message Attention - ParticipACTION	60	5.75 (.59)	-.56	-.30
Attitudes Toward the Message - ParticipACTION	60	5.73 (.86)	-1.44	1.57
Attitudes Toward the Video - ParticipACTION	60	5.71 (.92)	-1.49	1.56
Message Relevance - VERB	60	5.15 (1.01)	-1.49	2.50
Message Believability - VERB	60	5.49 (1.12)	-1.45	1.12
Message Attention - VERB	60	5.76 (.63)	-1.22	.98
Attitudes Toward the Message - VERB	60	5.64 (1.10)	-1.62	1.92
Attitudes Toward the Video - VERB	60	5.69 (1.06)	-1.58	1.66
Message Relevance - Paralympic	60	5.36 (.76)	-.02	.20
Message Believability - Paralympic	60	5.75 (1.00)	-1.61	2.09
Message Attention - Paralympic	60	5.83 (.63)	-.16	-.26
Attitudes Toward the Message - Paralympic	60	5.79 (.93)	-1.46	1.67
Attitudes Toward the Video - Paralympic	60	5.83 (.97)	-1.37	1.19