

THE NEED TO BELONG AND HEALTH PROMOTION

by

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Abstract

The overall purpose of this PhD thesis was to examine the need to belong and a sense of belonging in relation to health-enhancing cognitions and behaviours. In chapter 1, an overview is provided of the need to belong and a sense of belonging in relation to human behaviour. Next, in chapter 2, the findings are presented from two studies that examined the effectiveness of framing exercise as a means of boosting social skills (versus health benefits) for increasing self-regulatory efficacy, exercise intentions, and exercise behaviour among socially isolated individuals. Results from Study 1 revealed that the social skills manipulation led to greater self-regulatory efficacy (but not exercise intentions). In Study 2, all participants reported engaging in more exercise; however, those in the social skills condition also reported a greater sense of belonging than those in the health benefits comparison condition. Chapters 3, 4 and 5 present findings from a program evaluation that sought to examine a group-based mentorship lifestyle program for adolescent girls, which aims to foster a sense of belonging among participants. In chapter 3, results from the outcome evaluation are presented in which participants reported significant increases in health enhancing cognitions and behaviours at the end of, and 7 weeks after, program completion. Findings discussed in chapter 4 revealed that participants' cognitions at the end of the program prospectively predicted physical activity and healthy eating behaviour 7 weeks after program completion. In chapter 5, findings from a qualitative interview-based study indicated that participants enjoyed the program, reported changes in important health-enhancing cognitions and behaviours and developed meaningful relationships with program mentors and other program participants (i.e., a sense of connection to the program). Finally, a summary is provided in chapter 6 of the novel contributions of this research as well as limitations

and future directions for inquiry. In conclusion, the research presented within this dissertation demonstrates that the need to belong can be used to improve health-enhancing cognitions and exercise behaviour (chapter 2) and feelings of belonging are an important component of effective mentoring programs that target health behaviours among adolescent girls (chapters 3, 4 and 5).

Preface

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A program evaluation report pertaining to the results presented in chapters 3, 4 and 5 has been submitted to Big Brothers Big Sisters of Canada. The citation for this report is: Dowd, A. J.,

Beauchamp, M. R. & Jung, M. E. (2014). *Go Girls! Program evaluation final report*. Report presented to Big Brothers Big Sisters of Canada. My contribution was the formulation of the program evaluation questions, all administrative duties as the project coordinator (e.g., hiring and training research assistants to collect data in Ontario), data analysis, and report preparation.

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Chapter 1: Introduction

The need to belong has been conceptualized as a *fundamental human motivation* that can influence and explain a variety of human emotions, cognitions, and behaviours (Baumeister & Leary, 1995). Over the past century, psychologists including Freud (1930), Maslow (1968), Bowlby (1969) and Ainsworth (1989) have discussed the significant role that interpersonal connections play in peoples' lives. While these previous claims regarding the need to belong, also described as a need for connectedness or relatedness (Deci & Ryan, 1985; Lee & Robbins, 1995), were largely lacking in empirical support, evidence has emerged to suggest that the need to belong is a fundamental human motivation. In their seminal paper, Baumeister and Leary (1995) proposed the belongingness hypothesis, stipulating that "human beings have a pervasive drive to form and maintain at least a minimum quantity of lasting, positive, and significant interpersonal relationships" (p. 497). Baumeister and Leary (1995) outlined nine criteria¹ necessary to identify a basic human need (such as belongingness) and provided a comprehensive, critical review of studies involving the need to belong. Through this critical review article, Baumeister and Leary (1995) offered indirect evidence for the basic human need for belongingness. More recently, Gere and MacDonald (2010) presented further support based on evidence from studies that directly tested tenets of the belongingness hypothesis. From an applied perspective, fostering a sense of belonging in at-risk populations (e.g., minority students new to university) has shown promise in enhancing important outcomes including a sense of

¹ Baumeister and Leary (1995) suggested the following criteria to identify a basic human need:

A fundamental motivation should (a) produce effects readily under all but adverse conditions, (b) have affective consequences, (c) direct cognitive processing, (d) lead to ill effects (such as on health or adjustment when thwarted), (e) elicit goal-oriented behavior designed to satisfy it, (f) be universal in the sense of applying to all people, (g) not be a derivative of other motives, (h) affect a broad variety of behaviors, and (i) have implications that go beyond immediate psychological functioning. (p. 498)

belonging, self-efficacy, academic performance, and health status (Walton & Cohen, 2007, 2011). Thus, interventions designed to target the need to belong may be a fruitful strategy to increase motivation to engage in other adaptive behaviours.

In this dissertation, I suggest that the need to belong can help us understand health behaviours and ultimately could be used to inform health promotion initiatives. First, I provide a brief review of the literature on the need to belong and belongingness and highlight how these findings could be applicable in a health promotion setting. I then present the findings from two experimental studies (chapter 2), which provide an important basis for developing physical activity interventions for people at risk of feeling socially isolated and/or lonely (i.e., who lack a sense of belonging). Drawing on the findings from the first two studies, chapters 3, 4 and 5 provide the results from a program evaluation of a group-based mentoring program that aims to develop meaningful connections between participants (i.e., adolescent girls) and mentors. Through these studies I link the need to belong to health promotion, and then draw from the belonging and behavioural medicine literatures to suggest how fostering a sense of belonging may be an essential component in changing adolescent girls' health behaviours in a group-based mentoring program. Potential importance and implications of the findings are discussed.

The Need to Belong

Given the important effects of the need to belong on behaviour, the theme of social connections can be found in a number of theories of behaviour change. For example, Ajzen (1985, 1991) postulates in the theory of planned behaviour that subjective norms (i.e., perceptions of social pressures to behave a certain way) play an important role in predicting behavioural intentions. In addition, a component of social cognitive theory (Bandura, 1986) is that key social cognitions (such as sense of connections with others) interact with the

environment to influence behaviours. Furthermore, within self-determination theory it is suggested that feeling related to other people is one of three basic human needs (Deci & Ryan, 1985). However, the purpose of this paper is not to suggest that the need to belong is the only or even the most important need; but rather that the need to belong represents a basic human need that can be targeted and may be a useful source of motivation in health promotion initiatives. Indeed, findings from studies over the past decade highlight the importance of considering the need to belong in relation to physical and psychological health (Begen & Turner-Cobb, 2012; Hale, Hannum, & Espelage, 2005). In using the need to belong to understand and motivate health behaviours, it is important to consider (a) the population(s) for which the need to belong is relevant (i.e., is it universal?), (b) the effects of thwarting and (c) fostering the need to belong, specifically on emotions, cognitions, and behaviours, and (d) the effects of fostering belonging through different types of interventions.

Universal Nature of the Need to Belong

In order to satisfy the need to belong, it is suggested that there are two important components of interpersonal connections that must be available (Baumeister & Leary, 1995). First, individuals need to have pleasant interactions with another person on a repeated basis. Second, interpersonal connections with other(s) involve caring for one another's feelings and are also perceived as stable and enduring. From an evolutionary perspective, a universal drive to form and sustain social bonds has important survival and reproductive benefits (Bowlby, 1969). Indeed, evidence from observational and experimental studies suggests that people in societies worldwide engage in interpersonal interactions and have a desire to belong to social groups (e.g., Mann, 1980; Saroglou & Cohen, 2011). In addition, people resist breaking bonds as is evidenced by the difficulty and distress often associated with ending romantic relationships (Sprecher,

Felmlee, Metts, Fehr, & Vanni, 1998). However, there is a lack of research specifically examining the universal presence of the need to belong, which DeWall and Richman (2011) highlight as an important avenue for future research.

It has also been suggested that individuals need to balance the need to belong with the need to be different (Hornsey & Jetten, 2004). Specifically, optimal distinctiveness theory (Brewer, 1991) suggests that people are driven to find a balance between feeling similar and distinct in social groups and environments. People continually strive to feel different when they feel too similar and to feel similar when they feel too different (Brewer, 1991). For example, a novice runner may be motivated to join a “learn to run” group and feel a sense of belonging because she has similar goals and values to the other group members (i.e., learn how to run in a supportive environment). However, she is more likely to participate in and report the strongest identity to the group if she also feels she brings unique qualities to the group (e.g., humour, knowledge; Brewer, 1991). Thus, health promotion initiatives should make people feel included by highlighting similarities between group members, while also emphasizing each individual’s unique contributions.

Despite the theoretical contention that the need to belong is posited to be a universal human need, it should also be noted that some people display a need to *not* belong. For example, Brown, Silvia, Myin-Germei and Kwapil (2007) suggest that social anhedonia is one manifestation of a deviation in the need to belong. Characterized by social disinterest, displays of social anhedonia represent a characteristic of a type of individual who appears to not have a need to belong. Furthermore, these individuals arguably have a desire to *not* belong due to a self-reported preference to be alone and remain alone (Brown et al., 2007). Social anhedonia is common in clinical populations. For example, people affected by schizophrenia or autism

commonly display this behavioural symptom (Blanchard, Horan, & Brown, 2001; Chevallier, Kohls, Troiani, Brodtkin, & Schultz, 2012). Interestingly, in a study with university students, Brown and colleagues' (2007) found that there were some students who displayed a desire to *not* belong. However, it is important to note that these individuals displayed both a lower quality of well-being and less positive affect (Brown et al., 2007). Thus, although those with social anhedonia report a preference to avoid social connections (and not belong), when they do live in social isolation they also display debilitated quality of life outcomes.

In sum, the evidence suggests that amongst non-clinical populations, the need to belong is salient and an important component of physical and psychological health outcomes. Specifically, people exhibit a universal need to belong, which, when met, is associated with a variety of positive outcomes (e.g., Edwards, Wetzel, & Wyner, 2006; Lee & Robbins, 1998; Mashek, Stuewig, Furukawa, & Tangney, 2006; Williams & Galliher, 2006). Although there are some people who indicate they do not want to belong, the physical and psychological health outcomes suggest otherwise (i.e., they think that belonging is not an important need, when in fact the extant evidence would suggest it is). In light of the evidence for the universal nature of the need to belong, researchers have also explored the effects of experimentally priming social connections (or rejection) on individual's emotions, cognitions and behaviours.

Effects of Thwarting the Need to Belong on Emotions, Cognitions and Behaviours

Thwarting one's sense of belonging can result from social exclusion (when one is separated from others), rejection (direct assertion that a group or an individual is not wanted) and/or ostracism ("ignoring and excluding individuals or groups by individuals or groups", p. 427; Williams, 2007). While differences exist between the actions (i.e., social exclusion, rejection, ostracism) that lead to need thwarting, researchers do not commonly differentiate

between these terms and thus the terms will be used interchangeably in this dissertation (Williams, 2007).

There are a number of ways the need to belong can be thwarted. Indeed, while it makes intuitive sense that when rejected by a loved one, we feel a decreased sense of belonging, there is also evidence to suggest that people can feel rejected by others to whom they are not close. For example, studies using protocols such as “ball toss”², “cyberball”³ (Williams, 1997; Williams, Cheung, & Choi, 2000) or “life alone”⁴ (cf. Twenge, Baumeister, Tice, & Stucke, 2001) have found evidence to suggest that people generally report increased sadness and anger and reduced self-esteem, control and belonging following an episode of ostracism (Williams & Zadro, 2005). Whether rejected by close others, a computer, or a despised group (e.g., the Ku Klux Klan), there are said to be three stages of response to rejection; specifically the reflexive stage (during/immediately following rejection), the reflective stage (short-term coping) and the acceptance stage (long-term coping; Williams, 1997, 2001; Williams & Zadro, 2005).

Williams (1997, 2001) postulated that the first reaction to ostracism is reflexive and occurs during or immediately following an experience of ostracism. Drawing from studies that have used different protocols involving ostracism (e.g., cyberball, ball toss), reflexive reactions to exclusion are often disturbing and/or painful (e.g., effect sizes range from 1.0-2.0; Williams,

² Williams (1997) developed the ball toss experimental protocol to invoke feelings of social rejection. Participants (one actual participant and two confederates) arrive at a lab and are asked to wait for the experimenter to return. The confederates start tossing a ball around and toss it to the participant. After everyone has caught and thrown the ball several times, participants in the ostracism condition are never thrown to or acknowledged again while the confederates continue to toss the ball to each other for a few more minutes. Participants in the inclusion condition are thrown the ball a third of the time.

³ Cyberball was developed as an online version of ball toss (cf. Williams et al., 2000).

⁴ In the life alone protocol (Baumeister et al., 2002; Twenge et al., 2001), participants are asked to complete a personality test, are given correct information about their extroversion/introversion and are then either told they are the type of person who will have a life alone (social rejection condition) or have rewarding relationships throughout life (belonging condition).

2007). Other researchers such as Baumeister and colleagues (2002) have found that people do not report immediate personal distress following rejection. Indeed, there appears to be some controversy in the literature as to whether ostracism leads to personal distress (or not) and if ostracism increases or decreases sensitivity to social information (DeWall & Baumeister, 2006; Gardner, Pickett, & Brewer, 2000; Pickett, Gardner, & Knowles, 2004). Interestingly, contextual factors (e.g., intentional/unintentional ostracism; Eisenberger, Lieberman, & Williams, 2003) or individual differences (e.g., trait self-esteem, introversion-extroversion, need for belonging and loneliness; Carter-Sowell, Chen, & Williams, 2006; Leary, Haupt, Strausser, & Chokel, 1998; Nadasi, 1992) have not been found to moderate such reflexive reactions. However, it has been suggested that the method of ostracism may partially account for the range of different reflexive reactions reported (e.g., rejection from the cyberball paradigm is associated distress whereas rejection from the life alone paradigm is not associated with distress; Williams, 2007).

In contrast to the reflexive stage, short-term reactions to ostracism (i.e., the reflective stage) are affected by a number of moderators including individual differences (e.g., gender, loneliness; Cacioppo & Hawkley, 2005) and contextual differences (e.g., who the individual is rejected by and future possibilities for inclusion; Sommer & Rubin, 2005). For example, women are more likely to put in more effort on collective tasks after ostracism whereas men engage in social loafing after ostracism (Williams & Sommer, 1997). Williams (1997, 2001) proposed that the reflective stage involves attempts to fulfill the need(s) that is/are thwarted (e.g., belonging, control, self-esteem, meaningful existence); and as such, different behaviours result depending on the type of need thwarted. For example, Williams suggests that people will engage in aggressive behaviours when the need for control has been thwarted; whereas when desires to

reconnect are most prominent, people will be more likely to act prosocially. Indeed, this reasoning provides some insight into the range of short-term reactions to ostracism.

Finally, the acceptance stage involves long-term coping with repeated episodes of ostracism. Indeed, individuals coping with continuously being rejected by important others often report lower self-esteem, feelings of helplessness, suicidal thoughts and often even intentionally isolating themselves (Cacioppo & Hawkley, 2005; Zadro, 2004). Furthermore, a strong correlation between rejection and depression has been found (Slavich, O'Donovan, Epel, & Kemeny, 2010). Interestingly, researchers have suggested that depression may actually be an adaptive response (N. B. Allen & Badcock, 2003). Specifically, N. B. Allen and Badcock (2003) presented a social risk hypothesis, in which they suggest that depression may actually help chronically ostracized individuals to avoid further rejection through increased sensitivity to signs of social threat, which may lead to self-imposed social isolation to decrease chances of further rejection. Researchers over the past decade have also begun to assess the long-term effects of, and responses to, prolonged ostracism.

The effects of long-term ostracism have been explored in the domain of loneliness research. Prevalence studies from the United States suggest that at least 24% of Americans are affected by feelings of loneliness on a regular basis (Davis & Smith, 1998). Research suggests that age plays a role in the relationship between social interactions and loneliness. Specifically, a higher *quantity* of social interactions is associated with lower loneliness among young adults, whereas a higher *quality* of social interactions is related to lower loneliness among older adults (Victor & Yang, 2012). Directly relevant to the health problems evident in society today, excluded individuals are more likely to eat an unhealthy diet, be physically inactive, and smoke (Cacioppo & Hawkley, 2009; Shankar, McMunn, Banks, & Steptoe, 2011). Indeed, people who

report higher feelings of loneliness report lower well-being (Heinrich & Gullone, 2006). These findings indicate that there may be negative long-term effects when the need to belong is not met.

In considering potential mechanisms for these findings, researchers have examined the effects of social exclusion on self-regulation. The first set of findings revealed that experimentally induced feelings of social exclusion led to decreased self-regulation on a variety of tasks (e.g., consume a healthy, bad tasting drink, cookie consumption, dichotic listening task; Baumeister, DeWall, Ciarocco, & Twenge, 2005). However, when excluded people were paid for their performance on the listening task their performance improved, indicating that poor self-regulation was a result of decreased *motivation* to perform the task and not decreased *ability*. Follow-up studies found that if performance on the self-regulatory task was framed as diagnostic of social skills (i.e., something likely deemed as important for future inclusion), excluded individuals outperformed included individuals (DeWall, Baumeister, & Vohs, 2008). These studies demonstrate that excluded individuals are motivated to engage in behaviours if performance of the behaviour increases chances of future inclusion (or another valued reward). Research is warranted to determine if ostracized individuals can be motivated to engage in healthy behaviours by framing performance of the target (health behaviour) as predictive of social skills (required for social belonging). With this in mind, in the first two studies of my dissertation, I examined the effects of telling socially rejected people that self-regulating one's behaviour to engage in regular exercise is predictive of social skills, on their social cognitions and exercise behaviour (chapter 2).

Effects of Belonging on Emotions, Cognitions and Behaviours

In terms of conditions necessary for social connections, there is evidence that people treat in-group members preferentially (i.e., share rewards), even when groups are made arbitrarily (Tajfel, Flament, Billing, & Bundy, 1971) or randomly (Locksley, Oritz, & Hepburn, 1980). Recently, a set of studies examined the influence of “mere belonging” and found that participants (university students) who were told that they had the same birthday as a recent graduate of the math department persisted longer on insolvable math problems and reported stronger motivation for math compared to those who did not have the same birthday as the math graduate (Walton, Cohen, Cwir, & Spencer, 2011). As the authors hypothesized, sense of connectedness mediated this relationship. This study provides compelling support for the feasibility of fostering a sense of connection between strangers (at least in experimental settings). In addition to promoting increased effort on simple tasks, participants primed with minimal cues of social connectedness (e.g., having similar interests in music, travel, and school) to a confederate had the same physiological responses and reported feeling the same emotions (e.g., stress) when the confederate ran vigorously or endured a stress-inducing task (Cwir, Carr, Walton, & Spencer, 2011). Collectively, these findings suggest that mere social connections influence participants’ immediate emotions, cognitions, behaviours, and physiology.

Given that affective attitudes (e.g., enjoyment), and cognitions (e.g., self-efficacy, outcome expectations) are important determinants of health behaviours (Ajzen, 1991; E. S. Anderson, Winett, & Wojcik, 2007; Bandura, 1986, 1997; McAuley & Blissmer, 2000; Nasuti & Rhodes, 2013; R. E. Rhodes, Fiala, & Conner, 2009), it is important to consider the effects of the need to belong on these intrapersonal factors. There is evidence that a sense of belongingness is associated with positive affect (e.g., joy and elatedness when falling in love; Sternberg, 1986);

whereas feeling socially excluded leads to negative affect (upset, disheartened; Baumeister & Wotman, 1992). Leary (1990) reported that people who are socially excluded report higher levels of anxiety, depression, and loneliness. More recently, Stillman and colleagues (2009) found that experimentally induced feelings of social exclusion decreased feelings of meaning in life. Considering the findings that social exclusion reduces self-regulatory motivation (Baumeister et al., 2005) and can be associated with greater negative affect, it is hypothesized that this combination of cognitions and emotions could explain the tendency for socially excluded people to be less psychologically and physically healthy as included people (Hawkey, Thisted, & Cacioppo, 2009; Shankar et al., 2011).

On the other hand, fostering a sense of belonging can be a source of self-efficacy (i.e., confidence in one's ability to perform given behaviours; Bandura, 1997). Drawing from the educational literature, McMahon, Wernsman and Rose (2009) found that a student's sense of belonging to school predicted academic self-efficacy (i.e., one's confidence to achieve good grades in school). Considering the context can be useful in understanding this relationship. Specifically, when people are in groups in which they are surrounded by similar others with whom they have positive interactions and feel a sense of social support, they are likely to feel a sense of belonging (Baumeister & Leary, 1995). In this context (i.e., a supportive group environment), sources of self-efficacy are likely to manifest themselves (i.e., mastery experiences, vicarious experiences, verbal persuasion, and physiological feedback; Bandura, 1977). For example, students may observe similar others succeed and feel more efficacious as a result of vicarious learning (Bandura, 1986). In addition, when people are in an environment in which they feel socially connected to others and supported, it increases the likelihood of personal accomplishment (i.e., mastery experiences; Bandura, 1986; Brawley, Rejeski, & Lutes, 2000;

Duncan & McAuley, 1993). Another example involves verbal persuasion which occurs when an individual is told that he or she possesses the abilities to complete the behaviour successfully (Bandura & Adams, 1977). In social contexts, where people experience a sense of belonging, they are more likely to receive messages of support concerning their capabilities (i.e., verbal persuasion), than when such a sense of belonging is absent. In sum, when individuals experience a sense of belonging within social groups, this can have an important and adaptive impact on their social cognitions, emotions and behaviours. With this in mind, in the third, fourth and fifth studies of my dissertation, I examined the effects of a group-based program that aims to foster belonging among adolescent girls, while targeting health-enhancing cognitions and behaviours.

Research over the past decade has also examined the effects of belonging on physical and psychological health. Hale and colleagues (2005) examined perceptions of social support (one domain of which they conceptualized as belonging; the others were tangible support, disclosure and social intimacy) in relation to health behaviours among college students. Findings from this study revealed that belonging was the only component of social support that predicted health outcomes. Specifically, a sense of belonging positively predicted how healthy women perceived themselves to be; whereas for men, belonging predicted fewer physical symptoms. The authors suggest that people who have secure attachments (i.e., a sense of belonging) are better able to identify and effectively use support available to them, which enables them to take better care of themselves (thus resulting in improved health outcomes among those who report a higher sense of belonging).

More recently, Begen and Turner (2012) assessed the relationship between social belonging, self-esteem, mood and physical health among adolescents. A higher sense of belonging was related to improved affect and reduced physical symptoms. Consistent with Leary

and Downs' (1995) sociometer theory, results from the analysis revealed that self-esteem mediated the relationship between belonging and both positive and negative affect (separately) as well as the relationship between belonging and physical symptoms. Findings from other research with adolescents provide evidence that higher levels of social belonging are associated with better academic achievement and psychological health, while lower levels of belonging are associated with negative behavioural issues and substance use (Fleming, Catalano, Haggerty, & Abbott, 2010; Gregory & Weinstein, 2004).

It is important to consider the differences in priming social belonging compared to when it naturally exists. For example, researchers have primed a sense of belonging (or social rejection) through methods previously mentioned such as the life alone paradigm or cyberball. In these studies participants' sense of belonging was made salient and consequential emotions, cognitions and behaviours were measured. While we can learn a great deal about humans' reactions to satisfying/thwarting belonging needs through these studies, it is important to be aware that such studies typically examine belonging in a different context compared to when it naturally exists (e.g., a new relationship or connections to others in an important group). From a theoretical perspective, it is important to run controlled experiments to tease out and understand how a sense of belonging and/or ostracism can influence emotions, cognitions and behaviours; however, it is also important to test these relationships in real world settings.

Belonging in Practice

As highlighted earlier, a range of negative consequences arise when belonging is threatened or people feel socially rejected (e.g., aggression, loneliness, engagement in less physical activity; Cacioppo & Hawkley, 2009; Cacioppo, Hawkley, & Thisted, 2010; Hawkley et al., 2009; Twenge et al., 2001). Conversely, feelings of belonging are associated with positive

outcomes (e.g., positive affect, self-esteem, fewer anxiety and depression symptoms; Begen & Turner-Cobb, 2012; Lee & Robbins, 1998). As such, fostering a sense of belonging has the potential to have a number of positive effects, particularly among those at risk of, or who feel a low sense of belonging (i.e., those who are lonely and/or feel socially rejected). While there are many types of individuals who could benefit from social belonging interventions, one population that stands to benefit in particular is adolescents. Findings from a recent review suggest that up to 80% of adolescents (i.e., youth under the age of 18 years) report feeling lonely at least sometimes (Hawkley & Cacioppo, 2010). Drawing from the developmental and attachment literature (J. P. Allen & Land, 1999), meaningful connections are particularly important during adolescence because during this time period individuals experience improvements in interpersonal understanding and an increased capacity to understand the perspective of others. Recently, Laursen and Hartl (2013) provided a review of the specific changes that occur during adolescence that put this population at risk of perceived social isolation including changes in social circles, desire for autonomy, identity exploration, and both cognitive and physical changes. Although adolescents are at higher risk of social isolation, a number of positive effects are associated with belonging among adolescents in particular, including adaptive outcomes such as improved affect and health status (Begen & Turner-Cobb, 2012), academic engagement (Furrer & Skinner, 2003) and performance (Phan, 2013), and attendance at an after-school youth development program (Anderson-Butcher & Conroy, 2002).

Meaningful connections can be developed during adolescence through a number of avenues. For example, researchers have examined the impact of a variety of types of belonging including belonging to a community, school, one's family or an after-school program (Anderson-Butcher & Conroy, 2002; Begen & Turner-Cobb, 2012; Furrer & Skinner, 2003; Phan, 2013). A

common theme in these types of belonging is the presence of a supportive and caring adult (e.g., a teacher, parent/guardian or mentor). Indeed, a wide range of mentoring programs are available to adolescents that aim to foster healthy relationships between youth and a non-parent adult, with the overall aim to promote positive emotional, cognitive and identity development (J. E. Rhodes, Spencer, Keller, Liang, & Noam, 2006). J. E. Rhodes (2005) suggested that positive outcomes are only expected to occur from mentoring relationships if the mentee(s) and the mentor(s) develop a meaningful connection (see Figure 1.1 for an overview of this model). Such connections are theorized to develop when the youth and mentor spend regular quality time together and engage in meaningful interactions (e.g., relational and goal directed conversations; Karcher, Herrera, & Hansen, 2010; Karcher & Nakkula, 2010; J. E. Rhodes & DuBois, 2008). In line with Baumeister and Leary's (1995) belongingness theory, such mentoring programs have considerable scope and opportunity to develop a sense of belonging among adolescents. In a mentoring context, J. E. Rhodes theorized that through the development of these connections, the mentor can then foster social, emotional, cognitive and identity development which lead to improvements in academic performance, emotional well-being and behavioural outcomes (Karcher, Kuperminc, Portwood, Sipe, & Taylor, 2006; J. E. Rhodes, 2005; J. E. Rhodes et al., 2006; see Figure 1.1).

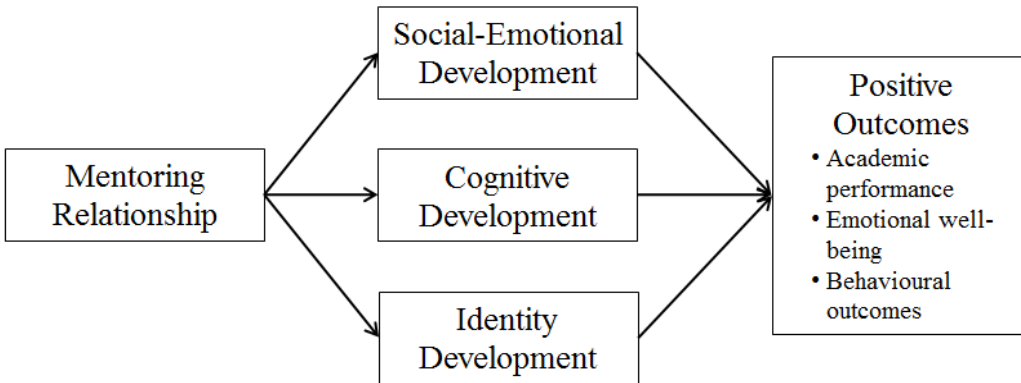


Figure 1.1. Model of youth mentoring (adapted from J. E. Rhodes, 2005).

Mentoring relationships are associated with a variety of positive outcomes including increased likelihood of mentees to graduate from high school and go to college, improved self-esteem and life satisfaction, lower involvement in gangs and violence, higher engagement in physical activity and use of birth control (DuBois & Silverthorn, 2005). The evidence suggests that longer mentoring relationships are associated with more beneficial effects on important outcomes in mentees, and relationships lasting more than one year are associated with the most positive outcomes (Grossman & Rhodes, 2002). Interestingly, mentoring relationships are more likely to enhance positive outcomes (e.g., academic performance, birth control use, physical activity) rather than prevent negative behaviours (e.g., drug use, smoking, binge drinking; DuBois & Silverthorn, 2005). DuBois and Silverthorn (2005) suggest that negative behaviours such as binge drinking and drug use could be seen as normative behaviours (particularly by older adolescents), rendering these behaviours harder to change.

Findings from studies over the past decade support the notion that belonging can be fostered through mentoring programs and thereafter foster positive outcomes for the mentees. For example, qualitative findings from an observational study of experiences at the Boys and Girls Club revealed that connections to program staff helped girls “feel good at the club” (Hirsch

et al., 2000). Furthermore, findings from longitudinal observations over a 1-year period revealed that perceptions of relationship closeness predicted perceived benefits and relationship continuation for both youth and mentors (Parra, DuBois, Neville, Pugh-Lilly, & Povinelli, 2002). Parra and colleagues (2002) suggest that strong bonds may lead to better outcomes (i.e., academic performance, health behaviours) because both parties are willing to put in more effort.

While the evidence suggests that mentors are vital in the creation of an environment in which the mentees feel safe and connected, it is also important to consider the role of peers (i.e., group members) when mentoring is delivered in a group setting. As Baumeister and Leary (1995) suggest, repeated positive interactions lead to belonging; thus, positive interactions with group members could also facilitate belonging to the group. For example, drawing from the group dynamics literature, group-mediated cognitive-behavioural interventions are delivered in a context that promotes group cohesion (Brawley et al., 2000). Through development of cohesion between group members, participants work toward individual and shared goals to improve their health behaviours (i.e., physical activity, healthy eating). Results from these studies indicate that participants report a sense of cohesion during and/or after the program (Cramp & Brawley, 2006; Wilson et al., 2012). Brawley and colleagues postulate that one of the reasons why the group-mediated cognitive-behavioural programs are effective is because the group is used as an *agent of change* (e.g., participants want to change because it is a group goal to exercise regularly). This type of intervention has been shown to lead to increases in physical activity among a variety of populations including cardiac rehabilitation patients, pregnant women and obese adolescents (Brawley et al., 2000; Cramp & Brawley, 2006; Wilson et al., 2012). In sum, research from the mentoring domain highlights the importance of interpersonal connections for adolescents. As such, group-based mentoring programs that foster meaningful social connections (i.e., sense of

belonging) may be particularly beneficial at targeting health-enhancing cognitions and behaviours among youth.

In the five studies reported in this dissertation, a range of methods was used to study the role of belonging in health behaviours. Specifically, in chapter 2, findings are reported from Study 1 in which participants' sense of belonging was experimentally manipulated and Study 2 which involved a brief intervention designed to increase physical activity among inactive lonely people. In order to examine the effects of a group-based mentoring lifestyle program which aims to foster a sense of belonging among adolescent girls, a longitudinal observational design was used in Studies 3 and 4 (described in chapters 3 and 4), and qualitative interview methods were used in Study 5 (presented in chapter 5).

Purpose and Structure of Dissertation

There is evidence to suggest that people have a desire to belong, and the strength of this desire varies between individuals (Leary, Kelly, & Cottrell, 2012). Given the prevalence of and correlations between feelings of loneliness, depression, and social anxiety, there is a substantial population whose need to belong is likely not met (Davis & Smith, 1998; National Comorbidity Survey, 2007; Rubinstein, Shaver, & Peplau, 1979). Moreover, this represents a population who could be motivated to engage in behaviours that could satisfy the need to belong. Specifically, Hawkey and Cacioppo (2010) highlight the lack of studies designed to help socially excluded people and suggest that future research should aim to elucidate the mechanisms that could improve the health of this population. The first two studies discussed in chapter 2 of my dissertation explored how the need to belong could be used to influence cognitions (Study 1 and 2) and exercise behaviour (Study 2). Study 1 employed an experimental lab-based design to determine if the effects of social rejection on exercise cognitions were dependent on the priming

of social skills (i.e., an ability to get along with others) or health benefits. Building on the first study, the purpose of Study 2 was to assess if lonely, inactive individuals engaged in more exercise when social skills (i.e., an ability to get along with others) or health benefits were primed. Given that belongingness is associated with adaptive outcomes (Begen & Turner-Cobb, 2012; Furrer & Skinner, 2003; Hale et al., 2005; Lee & Robbins, 1998; Phan, 2013), the purpose of the subsequent studies was to examine the effects of a program designed to foster a sense of belonging to the program. These effects were examined through a program evaluation of Big Brothers Big Sisters of Canada's program called *Go Girls! Healthy Minds, Healthy Bodies*, or *Go Girls!* for short, and consisted of (a) an outcome evaluation (i.e., after completing the program, do participants report improvement in targeted health-enhancing social cognitions and behaviours; chapter 3), (b) examination of psychosocial predictors of physical activity and dietary behaviours 7 weeks post program completion (i.e., do participants' cognitions at the end of the program predict behaviours 7 weeks after program completion; chapter 4), and (c) qualitative reports of participants' experiences in the program (chapter 5).

Chapter 2: Effects of Social Belonging and Task Framing on Exercise

Cognitions and Behaviour

General Introduction

Engaging in regular physical activity has numerous mental and physical health benefits, including enhanced well-being, reduced stress, and a decreased risk of cancer, cardiovascular disease, and type II diabetes (e.g., Penedo & Dahn, 2005; Tremblay et al., 2011; Warburton, Nicol, & Bredin, 2006). Despite the well-established positive outcomes resulting from leading an active lifestyle, the majority of adults in North America do not engage in sufficient levels of physical activity to attain health benefits (Bauman et al., 2009; Colley et al., 2011a). In light of the pervasiveness of physical inactivity, as well as the myriad health consequences associated with such behaviour, there have been growing calls for innovative theory-driven strategies to support the adoption and sustenance of active lifestyles across the age-span (R. E. Rhodes & Pfaeffli, 2010).

Beyond encouraging physical activity interventions that target the general population, there have been growing calls to develop and implement such interventions that target specific groups that are particularly at risk of negative health outcomes (Hawkey & Cacioppo, 2010). Of direct relevance to the current study, people who suffer from feelings of loneliness or social isolation are at particular risk of mental and physical health problems (Coyle & Dugan, 2012; Qualter et al., 2013) and are also less likely to be physically active (Cacioppo & Hawkey, 2009; Shankar et al., 2011). Given that 24% of adults report feeling lonely on a regular basis (Davis & Smith, 1998), the need to develop interventions to reduce feelings of loneliness and increase physical activity behaviour among lonely individuals is pressing.

Consistent with several prominent social cognitive theories (e.g., belongingness theory, Baumeister & Leary, 1995; social identity theory, Tajfel, 1972; optimal distinctiveness theory, Brewer, 1991) the need to belong is a salient driver of human emotions, cognitions and behaviours (Baumeister & Leary, 1995). Indeed, belongingness theory represents a promising framework to support the development of self-regulatory behaviours (such as physical activity) across a diverse range of life contexts (Baumeister & Leary, 1995). Humans possess an innate need to form social bonds because of the associated survival and reproductive benefits (e.g., Ainsworth, 1989; Bowlby, 1969). When the *need to belong* is satiated, individuals are more likely to engage in adaptive behaviours (e.g., prosocial behaviours; Parkhurst & Asher, 1992; Schonert-Reichl, 1999; Twenge et al., 2007) and feel more motivated in general (Walton et al., 2011). In contrast, when this need is thwarted, individuals often engage in maladaptive behaviours (e.g., aggression, unhealthy food choices; Baumeister et al., 2005; Twenge et al., 2001). Furthermore, satisfaction of the need to belong leads to a reduction in the drive for belongingness; whereas when not met, the need to belong is intensified and people are motivated to behave in ways to satisfy this need (Baumeister & Leary, 1995; DeWall et al., 2008). For example, compared to socially included individuals, socially rejected individuals tend to be motivated to a greater extent to demonstrate the necessary social skills needed to facilitate a future sense of belonging (DeWall et al., 2008). This phenomenon has been demonstrated in previous studies which have found that when performance on a self-regulatory task is framed as predictive of social skills, socially rejected individuals perform better when compared to both (a) individuals who feel more socially accepted and (b) socially rejected individuals for whom performance on the same task is framed as predictive of future health status (DeWall et al., 2008). Directly relevant to the current study, self-regulation is a key determinant of exercise

behaviour (Anderson, Winett & Wojcik, 2007). Thus, it is possible that framing self-regulation of exercise behaviour as predictive of social skills could promote more positive thoughts about exercise among those who feel socially rejected.

With this in mind, the overall objective of the two studies presented in this paper was to examine how the need to belong can be used to promote positive exercise cognitions and behaviour. In Study 1 we sought to explore how experimentally satisfying or thwarting the need to belong could influence exercise intentions and confidence to engage in exercise among otherwise healthy but inactive adults. Building on the findings from Study 1, in Study 2 a sample of inactive lonely individuals was recruited and through the use of a brief intervention, we explored how a desire to fulfil the need to belong could be used to motivate this at risk population to engage in regular exercise.

Introduction – Study 1

Along the lines of DeWall and colleagues (2008), the overall purpose of the first study was to examine the extent to which task framing (i.e., framing self-regulation of exercise as indicative of social skills or important for health benefits) bolstered two social cognitions that have consistently been found to predict exercise behaviour—intentions and self-regulatory efficacy. Intentions, which are incorporated in a range of theories of behaviour change (e.g., theory of planned behaviour, Ajzen, 1985, 1991; social cognitive theory, Bandura, 1986), represent a summary measure of motivation and an individual's willingness to put forth effort into a given behaviour (Ajzen, 1985, 1991). Thus, if an individual is motivated to engage in a given behaviour, he or she will likely report higher intentions to perform that behaviour. In addition, self-regulatory efficacy for exercise, which is defined as a belief in one's abilities to schedule and overcome barriers to engage in regular exercise (Bandura, 1997), is also an

important determinant of exercise behaviour (E. S. Anderson et al., 2007; Foley et al., 2008; Trost et al., 2003). Individuals who are confident in their capabilities to include exercise in their daily activities will report higher self-regulatory efficacy to exercise.

Using an experimental design, in Study 1 we examined the extent to which the effects of social belonging (future acceptance versus rejection) on exercise intentions and self-regulatory efficacy were dependent on whether self-regulation to exercise was framed as indicative of social skills (i.e., *social skills* condition) or health benefits (i.e., *health benefits* condition). DeWall and colleagues (2008) found that socially rejected people display increased self-regulatory capabilities when doing so provides an opportunity for social connection. In explaining this effect, DeWall and colleagues (2008) suggest that in contrast to socially accepted people, those who feel socially rejected are driven *to exert control* and display considerably *greater effort* in relation to tasks that provide them with the opportunity or prospect to gain a future of acceptance. Moreover, such reasoning is also consistent with the notion of self-efficacy, where it is asserted that “people exercise control for the benefits they gain by it” (Bandura, 1997, p. 16). Thus, drawing from both Bandura (1997) and DeWall et al. (2008), if engaging in physical activity provides a means for socially rejected people to feel connected to others in the future, engaging in exercise might provide them with a salient means to ‘exercise personal control’ (i.e., effectively self-regulate), and feel more confident in their capabilities to engage in the facilitative behaviour, namely physical activity. Furthermore, if exercise is framed as a means to gaining inclusion for socially rejected people, we would expect them to exert greater effort and intentions to be physically active to achieve the desired end-goal of social acceptance. In summary, by drawing from theorizing by Baumeister and Leary (1995), Bandura (1997) as well as findings by DeWall et al. (2008), it was hypothesized that socially rejected participants would report more

confidence in their abilities to self-regulate exercise behaviour (i.e., self-regulatory efficacy) as well as stronger motivation to exercise (i.e., exercise intentions) when engaging in exercise was framed as indicative of social skills rather than simply as important for health benefits.

DeWall et al. (2008) also found that socially accepted people performed poorly on a self-regulatory task when performance was framed as indicative of social skills. However, when accepted participants were paid based on their performance on the self-regulatory task, performance improved; thus it appears accepted participants lose the *motivation* and not the *ability* to self-regulate when performance is framed as indicative of social skills (DeWall et al., 2008). Building on these findings, among socially accepted participants (i.e., told they can expect a future where they are accepted, and thus the need to belong is satiated), framing exercise as indicative of social skills or in terms of health benefits was not hypothesized to differentially affect exercise intentions or self-regulatory efficacy.

Method – Study 1

Participants

Individuals were eligible to participate in this study if they were inactive (i.e., engaged in moderate-vigorous intensity exercise for less than 30 minutes on two or less days of the week⁵; $M_{\text{minutes of exercise}} = 27.47$ minutes/week, $SD_{\text{minutes of exercise}} = 28.94$) and were between 18-29⁶ years of age. One-hundred and fourteen university students took part in this study ($M_{\text{age}} = 20.33$, SD_{age}

⁵ The current (Canadian) Guidelines (Tremblay et al., 2011) for physical activity suggest that adults need to accumulate at least 150 minutes of moderate-to-vigorous intensity physical activity per week. By stipulating that, to be eligible to participate in this study, participants needed to engage in less than 30 minutes of moderate-to-vigorous physical activity on two or less days per week, we could be confident that participants were indeed “inactive”.

⁶ Twenty-nine years of age was the cutoff point due to the wording of the Future Rejected manipulation (i.e., “You may have friends and relationships now, but by your mid 30s most of these will have drifted away”).

= 2.62; 86.50% females) and participants represented a diverse range of ethnic backgrounds. We followed procedures used by Statistics Canada in the 2006 Census and allowed participants to identify all ethnic/cultural groups with which they self-identified (i.e., students could identify with more than one ethnic group). The largest represented ethnic groups were Chinese (30.23%), White (26.36%), Southeast Asian (e.g., Vietnamese, Cambodian; 10.08%), and Korean (7.75%). Eleven other ethnic groups were identified with a frequency of less than 5%. The sample was representative of the racial composition of this area of Canada (Statistics Canada, 2006).

Power Calculation

G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) software was used to conduct an a priori power analysis to determine the total sample size necessary for this study. Given that we were interested in hypothesized medium effects (based on findings from DeWall et al., 2008) for the interaction of social acceptance X exercise benefits on social cognitions, the following parameters were entered: effect size (f) = 0.30, α = .05, power = .80. The results of this analysis suggest that a minimum sample size of 90 participants was required for adequate power.

Measures

Leisure-time exercise. As a screening measure, individuals were asked to complete the Godin Leisure-time Exercise Questionnaire (LTEQ; Godin & Shephard, 1985). Individuals were asked to report the number of times they engaged in health-enhancing exercise (e.g., strenuous or moderate intensity exercise) for at least 15 minutes over the past week (i.e., frequency) as well as the average number of minutes of each exercise session (i.e., duration). Strenuous exercise is defined as exercise that leads to sweating, rapid breathing and heart rate, and difficulty holding a conversation. Moderate exercise is exercise that results in increased breathing and heart rate, but can be conducted while having a conversation (Centres for Disease Control and Prevention,

2011). Weekly exercise was calculated by multiplying the frequency and duration of exercise that participants reported engaging in per week, for both moderate and vigorous intensity exercise. Minutes of moderate and vigorous intensity exercise were summed for a total score reported in minutes per week of moderate and vigorous intensity exercise. Data derived from the Godin LTEQ have demonstrated good test-retest reliability, criterion-related validity and concurrent validity (Godin & Shephard, 1985; Jacobs, Ainsworth, Hartman, & Leon, 1993; Sallis & Saelens, 2000; Vallance, Courneya, Plotnikoff, Yasui, & Mackey, 2007).

Self-regulatory efficacy for exercise. Participants' confidence to self-regulate their exercise behaviour (e.g., overcome barriers to exercise and plan for regular exercise) over the upcoming two weeks was assessed using a 10-item measure developed by Shields and Brawley (2006). Items are measured using a standard 0 percent (*not at all confident*) to 100 percent (*completely confident*) self-efficacy scale (Bandura, 2006; McAuley & Mihalko, 1998). Higher percentages reflect higher self-regulatory efficacy beliefs. An exemplar item is "How confident are you that you can motivate yourself to get at least 30 minutes of exercise a day, at least 3 times per week over the next 2 weeks?" Data derived from this measure have provided evidence of satisfactory reliability (Cronbach $\alpha \geq .88$; Shields & Brawley, 2006). In the present study, scores derived from this instrument displayed acceptable internal consistency at both pretest and posttest assessments (Cronbach $\alpha \geq .93$).

Exercise intentions. Intentions to exercise were measured using a 3-item questionnaire developed based on work conducted by Woodgate, Brawley and Weston (2005) and Shields and Brawley (2006). In line with recommendations by Courneya and McAuley (1993), the first item asked participants to make a behavioural prediction in terms of exercise over the next week (in number of days). The second two items asked participants about their intentions and plans to

engage in a minimum amount of health-enhancing exercise. Specifically, exercise intentions were assessed through a mean score of (a) number of days per week the participant intended to exercise (*0-7 days*), (b) participant's *intention* to exercise at a moderate-vigorous intensity for at least 30 minutes at least 3 times a week over the next 2 weeks, and (c) participant's *plans* to exercise at a moderate-vigorous intensity for at least 30 minutes at least 3 times a week over the next 2 weeks. Items (b) and (c) were measured on a scale anchored from 1 (*very unlikely*) to 7 (*very likely*). Scores were standardized before averaging responses to the three items. The scores derived from the intentions measure in this study had acceptable internal consistency values at both pretest and posttest (Cronbach $\alpha s \geq .75$).

Procedure

Prior to conducting this study, ethical approval was obtained from the first author's institution review board. Participants were recruited from a large university in Western Canada through posters, emails, and booths in undergraduate student residences. After indicating their interest in taking part in the study, eligible individuals were subsequently sent an information letter and asked to complete the consent form and online baseline questionnaire (pretest measures of exercise intentions and self-regulatory efficacy). Participants were then invited to the lab to complete the rest of the study.

Participants completed the study individually. When each participant arrived for the lab component of the study, they were reminded of the voluntary nature of the study and of their ability to withdraw at any time. Next, participants were randomized to one of four conditions (future rejection health benefits; future rejection social skills; future acceptance health benefits; future acceptance social skills) and invited to complete a questionnaire designed to assess the participant's personality (Eysenck, Eysenck, & Barrett, 1985) and social connectedness (Lee,

Draper, & Lee, 2001)⁷. After completing this questionnaire, the participant was asked to read a physical activity guide for university students (Bray et al., 2011) while the researcher ostensibly processed the participant's personality test results. The participant was asked to read the physical activity guide to ensure all participants knew how much physical activity would lead to physical and mental health benefits. Consistent with procedures developed by Twenge et al. (2001), each participant was then given correct feedback from the personality test regarding levels of introversion or extraversion (to bolster believability) and then told that based on the results of the personality test, they either had a personality type to which they could expect positive and lasting relationships throughout life (future acceptance condition) or that they had a personality type to which they could expect to end up alone later in life (future rejection condition). Ten participants were excluded from the analyses because they did not believe the "personality test results" (i.e., telling them to expect a future of acceptance/rejection). These participants did not differ from the rest of the sample in any demographic variable and were evenly distributed across all conditions.

Based on an adaptation of procedures developed by DeWall and colleagues (2008), the researcher then gave participants a leaflet that contained the task framing information about either (a) how engaging in regular exercise is indicative of self-regulation which is associated with characteristics that are important for social relationships (social skills condition) or (b) how engaging in regular exercise is associated with health benefits (health benefits condition). In the social skills condition, participants were provided with a leaflet suggesting that people who have the self-control to engage in exercise also have the self-control necessary for meaningful social relationships. In the health benefits comparison condition, participants were provided with

⁷ Based on pilot testing, the social connectedness measure was included to increase believability of the personality test results. This measure was not included in the analyses.

information that outlined the health benefits of engaging in regular exercise. It should be noted that the health benefits condition represents a *standard care* comparison, insofar as the task framing message that “exercise is important for health benefits” reflects the prototypical health message designed to foster physical activity behaviour. In this study we wanted to examine whether a message that exercise is indicative of social skills surpasses the effects of such standard care messages in promoting health-enhancing exercise cognitions.

Participants then completed the two posttest measures (self-regulatory efficacy and exercise intentions). Following completion of the posttest measures, participants were debriefed and asked if the results of the personality test were consistent with how they viewed themselves. Participants were excluded if they expressed suspicion about the results of the personality test (i.e., they did not believe that the results of the personality test were about them; $n = 10$). The researcher then fully explained the deception procedures used in this study, provided a copy of the debriefing form, answered any additional questions and gave participants \$10 as compensation for their participation. Participants were also given the opportunity to retrospectively withdraw their consent/involvement in this study.

Design

This study used a pretest-posttest comparison group design, with the *social acceptance* (future rejection or future acceptance) and *task framing* (regular exercise is indicative of social skills or important for health benefits) conditions as between groups factors. Time (pretest and posttest) was operationalized as a within groups factor, and intentions and self-regulatory efficacy were specified as dependent measures.

Results – Study 1

Changes in Self-regulatory Efficacy and Intentions Over Time Across Conditions

Paired t -tests revealed that from pretest to posttest, participants across all four conditions (combined) reported significant increases in self-regulatory efficacy ($M_{\text{change}} = 8.82$, $SD = 15.40$), $t(103) = 5.84$, $p < .001$, $d = 0.45$; however no significant changes in exercise intentions were found, ($M_{\text{change}} = 0.01$, $SD = 0.83$), $t(103) = 0.07$, $p = .94$, $d = 0.00$. Subsequent analyses examined variability in change among the four conditions from pre to post for both dependent variables using difference scores. The analysis of difference scores is considered appropriate when the main outcome of interest is *change* in a dependent variable over time (Thomas & Zumbo, 2012). Specifically, we were interested in how changes in self-regulatory efficacy and exercise intentions differed between conditions. Separate 2 (belonging: social rejection vs. social acceptance) \times 2 (task framing: health vs. social skills) analysis of variance (ANOVA) were conducted on difference scores for the dependent variables (intentions, self-regulatory efficacy). A priori planned pairwise comparisons were run to examine any significant interaction effects.

Self-regulatory Efficacy for Exercise

The analysis of self-regulatory efficacy yielded no significant main effect for the belonging manipulation, $F(1, 100) = 0.01$, $p = .969$, $\eta^2 = .01$, nor task framing, $F(1, 100) = 1.54$, $p = .218$, $\eta^2 = .015$. However, the interaction between belonging and exercise benefits was significant, $F(1, 100) = 4.01$, $p = .048$, $\eta^2 = .039$. As hypothesized, among participants led to expect a future of social rejection, learning that exercise was indicative of having social skills led to greater increases in reported self-regulatory efficacy ($M_{\text{social skills}} = 13.67$, $SD = 15.63$) when compared to the condition where participants were primed with the health benefits of exercise ($M_{\text{health}} = 3.96$, $SD = 13.41$), $t(47) = 2.97$, $p = .005$, $d = 0.88$. In contrast, and consistent with our

hypothesis, the framing of exercise had no significant differential effect on changes in self-regulatory efficacy among those led to expect a future of social acceptance ($M_{\text{social skills}} = 7.79$, $SD = 15.41$; $M_{\text{health}} = 10.07$, $SD = 16.25$), $t(53) = .02$, $p = .981$, $d = 0.15$. Figure 2.1 displays these findings.

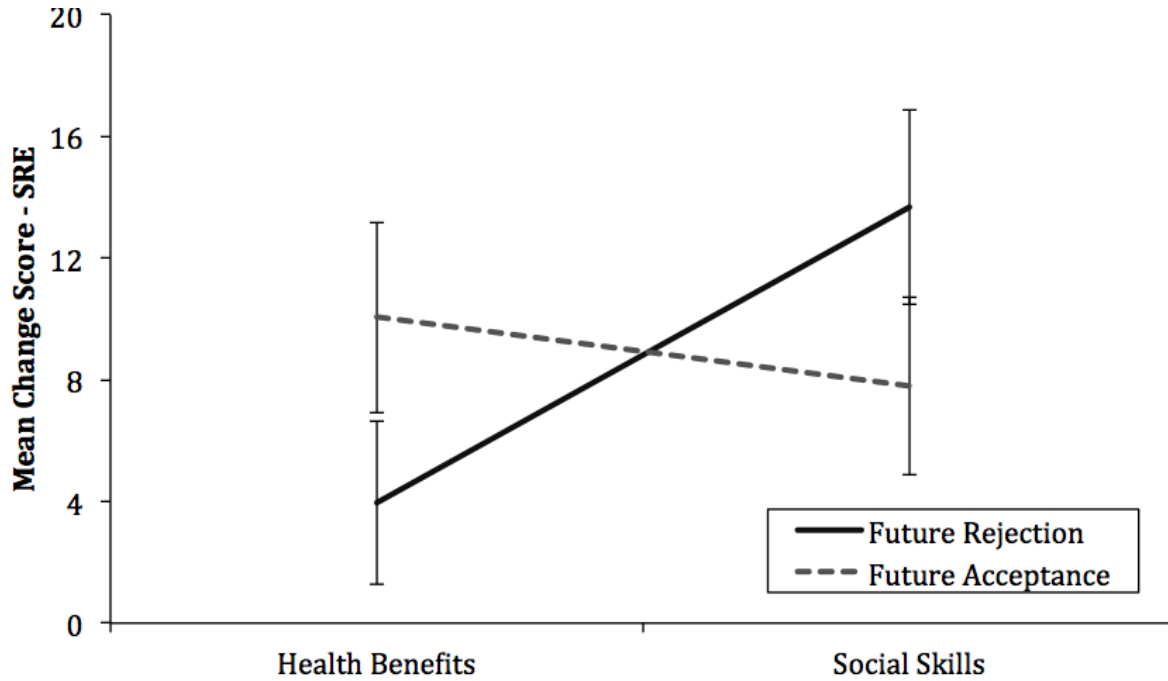


Figure 2.1. Mean change scores for self-regulatory efficacy (SRE) for each condition. Error bars represent standard error.

Exercise Intentions

A 2 (belonging: social rejection vs. social acceptance) x 2 (task framing: health vs. social skills) ANOVA was conducted using difference scores to evaluate the effects of belonging expectations and exercise benefits on exercise intentions. There was no significant main effect for belonging expectations, $F(1, 100) = 0.29$, $p = .59$, $\eta^2 = .003$, nor task framing, $F(1, 100) = 1.36$, $p = .16$, $\eta^2 = .019$, on exercise intentions. Contrary to our hypothesis, the interaction between belonging and task framing was not significant, $F(1, 100) = 1.26$, $p = .18$, $\eta^2 = .018$,

although a visual inspection of the data (see Figure 2.2) suggested the difference in the standardized means was in the hypothesized direction between the future rejection social skills ($M_{\text{social skills}} = 0.27, SD = 0.85$) and the future rejection health benefits ($M_{\text{health}} = -0.81, SD = 0.61$) conditions.

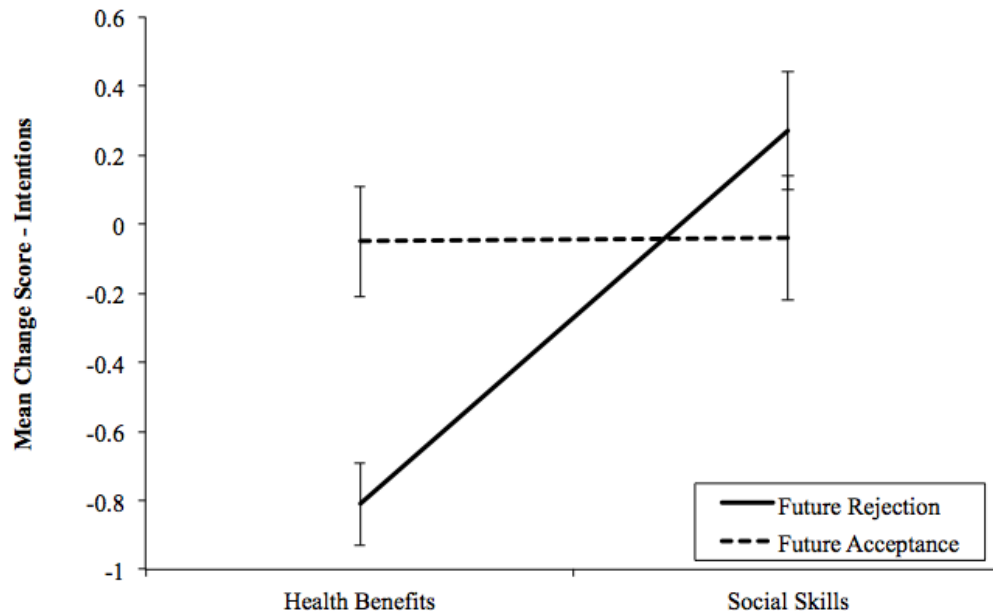


Figure 2.2. Mean change scores for intentions for each condition. Error bars represent standard error.

Discussion – Study 1

The purpose of this study was to examine the effects of task framing and a future belonging manipulation in relation to changes in self-regulatory efficacy beliefs and intentions to engage in exercise. Consistent with our hypothesis, we found an interaction between belonging and task framing on self-regulatory efficacy. Specifically, socially rejected participants (i.e., those in the future rejection condition) reported greater confidence in their capabilities to self-regulate their exercise behaviour when exercise was presented as indicative of social skills in comparison to those for whom the health benefits were emphasized. Although the pattern of

findings for intentions was similar to that for self-efficacy, the interaction was not significant for changes in intentions among socially rejected participants. Consistent with our hypothesis, among participants in the future acceptance condition, changes in self-regulatory efficacy and intentions were not differentially affected by how exercise was framed.

The findings for participants' self-regulatory efficacy beliefs are consistent with previous studies showing that socially rejected people display increased self-regulatory capabilities when doing so provides an opportunity for social connection (DeWall et al., 2008). Although the pattern of findings was similar for exercise intentions, the interaction was not significant. Therefore, findings from this study suggest that in an exercise context, socially rejected individuals' self-regulatory efficacy beliefs might be more malleable than exercise intentions by virtue of the prospect of future acceptance. Of course, an alternative explanation for the difference in findings is that the self-regulatory efficacy measure may be more sensitive to changes when compared to the measure of exercise intentions. For example, across the entire sample only self-regulatory efficacy and not exercise intentions were increased by the procedures as a whole.

Consistent with our hypothesis, among socially accepted participants, the framing of exercise had no differential effect on changes in exercise intentions and self-regulatory efficacy. These findings fall directly in line with theorizing by Baumeister and Leary (1995) and findings from DeWall et al. (2008) such that, when compared to socially rejected people, accepted people do not appear to be more motivated (and in the current study, not more confident) to engage in a behaviour that garners them the social acceptance that they have already attained. Interestingly, among socially accepted people, highlighting the health benefits of exercise (i.e., a standard health promotion technique) led to similar increases in exercise intentions and self-regulatory

efficacy beliefs as information that presented exercise as indicative of social skills. Indeed, this finding is consistent with the health promotion literature such that targeting instrumental beliefs (e.g., health benefits) does not lead to substantive cognitive or behavioural changes when compared to affective judgments (Gellert, Ziegelmann, & Schwarzer, 2012; Lowe, Eves, & Carroll, 2002; R. E. Rhodes et al., 2009).

In terms of potential mechanisms for the enhancement in self-efficacy among those who were exposed to the social rejection manipulation, one should consider that exercise was framed as a way to attain desired connections with others, and most importantly, a behaviour over which they had personal control. Thus, socially rejected participants in the social skills condition may have reported greater confidence to exercise because they saw exercise as an achievable means to connect with others (a particularly salient outcome for rejected individuals). These findings highlight the potential utility of this type of intervention for not only influencing socially rejected individuals' self-regulatory efficacy for exercise, but also exercise behaviour. From an external validity perspective, one way to test this assertion includes an investigation of this intervention among those who dispositionally feel a lack of social connection. Thus, in Study 2, we examined whether such a message could encourage those who report higher dispositional feelings of loneliness to engage in a greater amount of exercise. Specifically, the purpose of Study 2 was to explore the effects of task framing of exercise (i.e., social skills or health benefits) on the exercise behaviour of lonely individuals (de Jong Gierveld, van Tilburg, & Dykstra, 2006).

Introduction – Study 2

Findings from Study 1 suggest that socially rejected individuals report greater confidence in their self-regulatory capabilities to exercise when engaging in regular exercise is presented as being associated with social skills as compared to when health benefits are emphasized. Given

that self-regulatory efficacy is an important predictor of exercise behaviour (e.g., Anderson, Winett & Wojcik, 2007), one goal of Study 2 was to determine whether a social skills framing of exercise would also increase exercise behaviour. Specifically, we examined whether those at risk for experiencing social rejection (i.e., in this case, lonely individuals) would engage in more exercise when that activity was framed as indicative of having the social skills necessary for social inclusion (i.e., social skills manipulation), compared to when exercise was framed as important for health benefits. It was hypothesized that compared to those in the health benefits comparison condition, participants in the social skills condition would report greater changes in exercise 2 weeks after this brief intervention.

Building on the findings of Study 1, the secondary goal of this study was to replicate the effects of this brief intervention on self-regulatory efficacy among a population of lonely individuals. As in Study 1, we examined the effects of framing exercise as indicative of social skills or important for health benefits on participants' self-regulatory efficacy for exercise (in addition to actual exercise behaviour). Based on the findings from Study 1, with regard to socially rejected participants (i.e., similar to lonely people in the current study), it was hypothesized that participants in the social skills condition would report greater increases in self-regulatory efficacy when compared to those in the health benefits condition. Considering the prospective nature of Study 2, we also explored the effects of the intervention on social cognitions salient for lonely individuals. Specifically, we examined the effects of the intervention on participants' sense of belonging and feelings of loneliness. It was hypothesized that if lonely individuals are motivated to exercise as a way to demonstrate social skills (because they see the connection between self-control necessary for both regular exercise and meaningful relationships), engaging in more exercise may be associated with a greater sense of belonging

and less feelings of loneliness. Thus, this association was hypothesized to be greater for participants in the social skills condition when compared to those in the health benefits condition.

Method – Study 2

Participants

Individuals were eligible to participate in this study if they were inactive (i.e., engaged in moderate-vigorous intensity exercise on two or less days of the week), were at least 18 years of age and reported higher than average levels of loneliness (indicated by a score of 25 or higher on the UCLA Loneliness Scale⁸). A separate sample of individuals from Study 1 was recruited for this study. Eighty-four inactive lonely university students ($M_{\text{age}} = 21.96$ years, $SD_{\text{age}} = 5.22$; 72.60% female) volunteered to take part in this exercise study and six individuals dropped out after Time 1. There were no significant differences between participants who dropped out and those who participated in the study in terms of demographics or condition. Participants represented a diverse range of ethnic backgrounds. The same procedures as with Study 1 were used, whereby participants were asked to identify all ethnic/cultural groups with which they self-identified (Statistics Canada, 2006). The largest represented ethnic groups were White (30.21%), Chinese (27.38%), Southeast Asian (e.g., Vietnamese, Cambodian; 14.89%), and Korean (9.65%). Eight other ethnic groups were identified with a frequency of less than 5%.

Power Calculation

⁸ Criterion measures of loneliness among university student populations were determined from the mean across three studies examining loneliness in similar populations (see Russell, 1996). Ratings of 25 or higher (i.e., the cutoff point used in Study 2) represented feelings of loneliness equal to or greater than 1 standard deviation above mean ratings of loneliness in these three studies.

G*Power 3 (Faul et al., 2007) software was used to conduct an a priori power analysis to determine the total sample size necessary for this study. Given that we were interested in hypothesized medium effects (based on findings from Study 1 as well as DeWall et al., 2008) for the main outcome variable (exercise behaviour) the following parameters were entered: effect size (d) = 0.55, α = .05, power = .80. The results of this analysis suggest that a sample size of 84 participants was required.

Measures

In addition to the self-regulatory efficacy for exercise and the Godin LTEQ measures previously described in Study 1, this study used the social connectedness scale (Lee et al., 2001) and the UCLA Loneliness Scale (Russell, 1996). In the current study, scores derived from the social connectedness, self-regulatory efficacy and UCLA loneliness measures demonstrated acceptable internal consistency values (Cronbach α s $\geq .72$).

Social connectedness. Feelings of social connectedness were assessed using the 20-item social connectedness scale (Lee et al., 2001). Participants were asked to rate how much they agreed with each statement using a scale anchored by 1 (*strongly disagree*) and 5 (*strongly agree*). Sample items include: “I feel comfortable in the presence of strangers” and “I feel close to people.” After reverse scoring negatively worded items, answers were summed to obtain a total score, with higher scores reflecting a higher sense of social connectedness. Data from previous studies provide evidence for construct and criterion validity of measures derived from this instrument (Lee, Dean, & Jung, 2008).

UCLA loneliness scale. Feelings of loneliness were assessed using the 10-item UCLA loneliness scale (Russell, 1996). Participants were asked to rate how much they agreed with the statement using a scale from 1 (*never*) to 4 (*often*). Sample items include: “I lack

companionship” and “I feel left out.” After reverse scoring negatively worded items, answers are summed to derive a total score. Higher scores indicate greater feelings of loneliness. Data derived through previous studies provide evidence for the reliability of scores from this instrument (Cronbach $\alpha = .89$; Russell, 1996).

Procedure

Prior to conducting this study, institutional ethical approval was obtained. Participants were recruited from a large university in Western Canada through posters, emails, and booths in undergraduate student residences. After indicating their interest in taking part in this study, eligible individuals were subsequently sent an information letter and asked to complete the consent form and online baseline questionnaire. Participants were then invited to the lab to complete the next part of the study.

When participants arrived for the lab component of the study, they were reminded of its voluntary nature and of their ability to withdraw at any time. Next, participants were randomized to one of two experimental conditions [exercise for health benefits (standard care comparison condition) or exercise indicative of social skills] and asked to read the physical activity guide for university students (Bray et al., 2011). Consistent with procedures used in Study 1, and adapted from DeWall and colleagues (2008), the researcher then gave participants a task framing information sheet detailing either (a) the health benefits of engaging in regular exercise (health benefits comparison condition), or (b) that engaging in regular exercise is indicative of self-regulation which is associated with characteristics that are important for social relationships (social skills condition). After exposure to either the health benefits or social skills (i.e., a suggested method for future acceptance) information sheets, all participants were given an exercise planning activity to provide them with the necessary resources to be physically active

over the next two weeks if they wanted to do so. Participants then completed another questionnaire assessing self-regulatory efficacy. Participants were asked to come back in 2-weeks' time to complete the final questionnaire package (i.e., exercise behaviour, self-regulatory efficacy, loneliness, and belonging). After completing the posttest measures, the researcher then fully explained the procedures used in this study, provided participants with a debriefing form, answered any additional questions, and gave participants compensation for their participation (\$10).

Design

This study employed a pretest-posttest comparison group design, with condition (participants told self-regulation of exercise behaviour leads to health benefits versus indicative of social skills necessary for belonging) as a between-groups factor, time (pretest, posttest) as a within-groups factor, and four dependent variables (exercise behaviour, self-regulatory efficacy, belonging, and loneliness).

Results – Study 2

Independent samples *t*-tests were conducted on simple difference scores to examine differences between (a) pretest and posttest (across both conditions) and (b) the two groups on the dependent variables. As with Study 1, difference scores were used because the main outcome of interest was in changes in the dependent variables (Thomas & Zumbo, 2012). Two weeks after completing the brief intervention, participants in *both* conditions reported engaging in significantly more exercise, and reported significantly higher self-regulatory efficacy for exercise and belonging, as well as less loneliness, $ts \geq 4.03$, $ps < .001$, $ds \geq 0.65$, when compared to baseline measures (see Figures 2.3 and 2.4). Consistent with our hypothesis, compared to participants in the health benefits condition, two weeks after completing the brief intervention,

participants in the social skills condition reported significantly greater increases in sense of belonging, $t(76) = 2.22, p = .03, d = 0.51$. Contrary to our hypothesis, compared to participants in the health benefits condition, participants in the social skills condition did not report engaging in significantly more exercise, nor did they report greater increases in self-regulatory efficacy or greater decreases in loneliness, $ts \leq 1.26, ps \geq .21$. These findings are displayed in Figures 2.5 and 2.6.

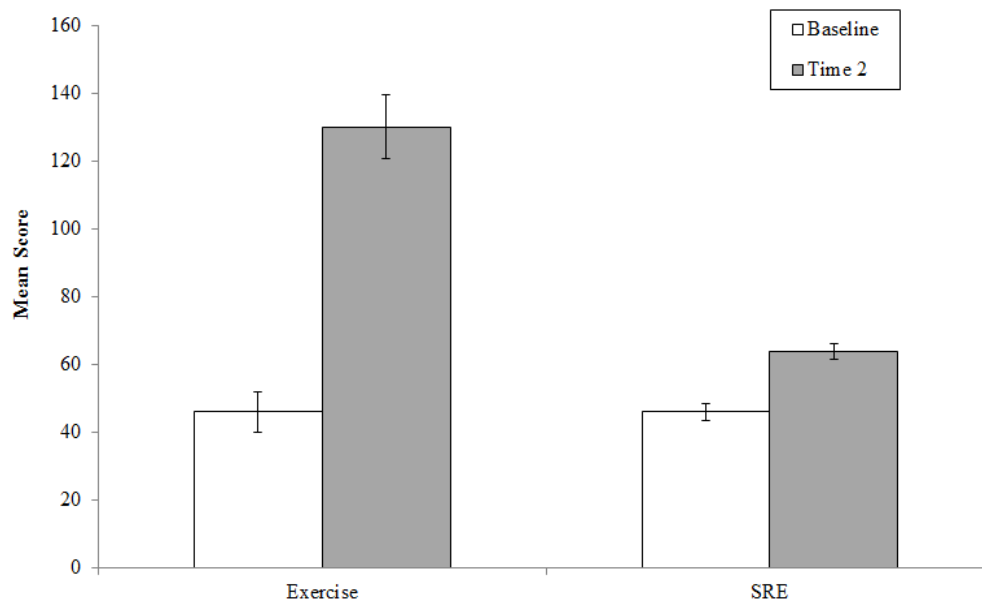


Figure 2.3. Mean scores for exercise (minutes per week) and self-regulatory efficacy (SRE) at Baseline and Time 2 for all participants in Study 2. Error bars represent standard error.

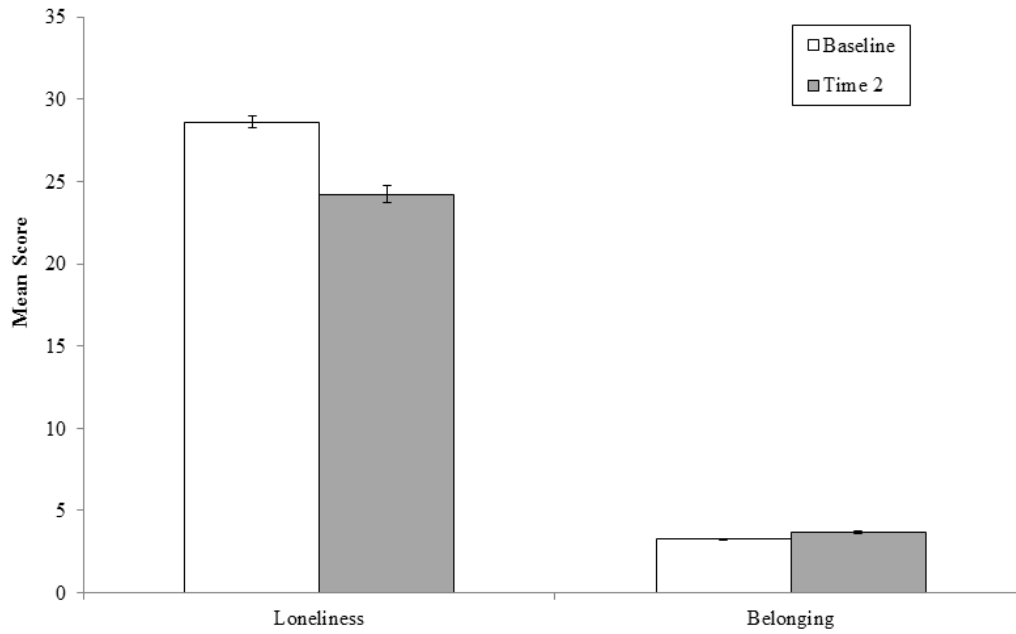


Figure 2.4. Mean scores for loneliness and belonging among all participants at Baseline and Time 2 in Study 2. Error bars represent standard error.

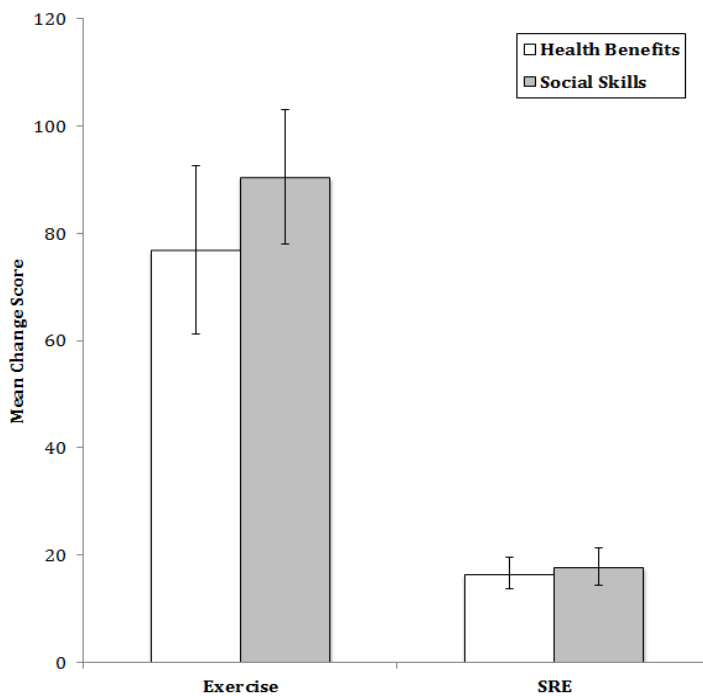


Figure 2.5. Mean change scores for exercise (in minutes per week) and self-regulatory efficacy (SRE) for each condition in Study 2. Error bars represent standard error.

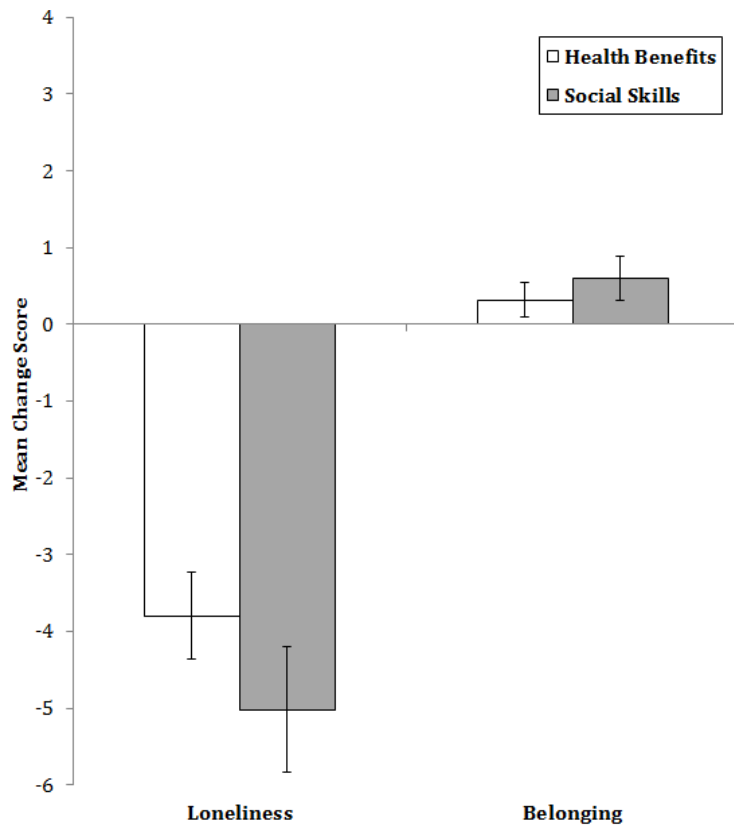


Figure 2.6. Mean change scores for loneliness and sense of belonging for each condition in Study 2. Error bars represent standard error.

Discussion – Study 2

The purpose of Study 2 was to test the effectiveness of framing exercise as beneficial for social skills (versus beneficial for health), and whether this would lead to increases in exercise behaviour and improved social cognitions for dispositionally lonely inactive individuals. Both conditions led to significant improvements in exercise behaviour, self-regulatory efficacy, sense of belonging, and loneliness compared to baseline. In terms of relevant health promotion outcomes, compared to the standard care health benefits comparison condition, the social skills condition produced comparable positive behavioural and psychological outcomes. Thus, framing self-regulation to exercise as indicative of social skills boosted exercise behaviour, and this intervention was at least as effective as a standard care (e.g., highlighting the health benefits)

instruction. Furthermore, compared to those in the health benefits condition, participants in the social skills condition reported additional benefits of greater increases in sense of belonging two weeks after the brief intervention. Given the high prevalence of inactivity (Bauman et al., 2009; Canadian Fitness and Lifestyle Research Institute, 2009), feelings of loneliness (Davis & Smith, 1998), and the positive benefits associated with a greater sense of belonging (e.g., see Baumeister & Leary, 1995; Gere & Macdonald, 2010, for reviews), it is promising that a simple social skills intervention technique may positively influence physical activity behaviour and feelings of belonging among this at risk population.

General Discussion

The purpose of these two studies was to examine the effects of task framing on social cognitions (Studies 1 and 2) and behaviour (Study 2). Findings from these studies are particularly relevant for socially rejected individuals. Specifically, socially rejected individuals reported being more confident in their ability to engage in exercise when it was framed as a way to attain desired social connections. Furthermore, lonely adults who were exposed to a social skills task framing manipulation demonstrated increases in exercise behaviour that were directly comparable with changes found in a standard care health promotion intervention. In addition, compared to participants who read the health benefits information, the social skills information condition was associated with greater increases in feelings of belonging among lonely adults.

Results from these studies provide an important basis for developing health-enhancing physical activity interventions and are particularly relevant for people at risk of social isolation (i.e., who lack social connections) or who are socially isolated and/or lonely. For example, an exercise promotion intervention for inactive, lonely individuals could highlight the importance of self-control and how it transcends contexts—people who have the self-control to engage in

health behaviour (such as exercise) also are more likely to have the self-control for positive social relationships. Future research could explore the extent to which any acute effects of such an intervention are sustained over a longer time frame (e.g., 6 months, 1 year).

While the present findings are intriguing, several limitations should be acknowledged. First, differences between the populations used in these two studies are important to recognize. While participants were explicitly socially rejected in Study 1, dispositionally lonely people were recruited in Study 2. Although loneliness is often an emotional state that stems from social rejection (de Jong Gierveld et al., 2006), it is important to note that socially rejected and lonely populations are not directly synonymous. With these differences in mind, researchers should be aware that there may be different patterns of results when studying and/or implementing interventions with socially rejected versus lonely populations. Second, the main outcome variables in both studies were self-reported (i.e., exercise cognitions and behaviour). Indeed, self-reported outcome variables are subject to bias. In the future, researchers could substantiate these findings by employing an objective measure of physical activity (e.g., accelerometry) or a measure with personal accountability of behavioural intentions such as asking participants to sign up for an exercise program. A third limitation is that participants were university students, which limits the generalizability of these findings. Specifically, it would be important for researchers to explore the effects of this intervention on different populations who might be more likely to be lonely or to experience social rejection (e.g., overweight individuals, elderly adults, individuals with disabilities).

Fourth, findings from Study 2 do not provide insight into potential mechanisms for changes in the outcome variables. Both interventions led to significant improvements in reported exercise behaviour, self-regulatory efficacy, and loneliness; although the effects of the

interventions did not differ from one another on the differences in these change scores (thus, precluding us from conducting any tests of mediation). It is possible that the exercise primes did not differentially influence exercise behaviour or cognitions because all participants were exposed to the physical activity guide and planning activity (cf. Bray et al., 2011). Indeed, previous studies have found that planning activities led to increases in exercise behaviour and self-efficacy (for review see Belanger-Gravel, Godin, Bilodeau, & Poirier, 2013). In future research, it would seem particularly prudent to tease out the differential effects of the framing primes from any effects derived from the brief planning activity. That is, future efforts should examine the effects of message framing without the planning activity, and the planning activity without the framing. Results of a recent meta-analysis on the effects of implementation-intentions (i.e., planning) on physical activity were in the small-to-medium range ($d = .31$, Belanger-Gravel et al., 2013), and it would be important to ascertain the unique effects of the framing activity once these effects of planning are controlled. Nevertheless, it is noteworthy that although differences in mean reports of physical activity were not statistically significant between the social skills and health benefits conditions, they were in the hypothesized direction (See Figure 2.5; $M_{\text{social skills}} = 90.53$ minutes/week; $M_{\text{health benefits}} = 76.89$ minutes/week). Future work is warranted to examine whether a refined social skills intervention not only results in significant improvements in belonging but also exercise behaviour.

Despite these limitations, the results of these studies are noteworthy for a number of reasons. First, both studies employed randomized controlled experimental designs, which enable us to make stronger conclusions regarding the reasons for differences between conditions. Furthermore, Study 2 tested theory in a real-world setting by examining how one's desire to satisfy the need to belong could influence behaviour and cognitions, specifically regarding

health-enhancing exercise behaviour. Third, to the best of our knowledge this is the first study to specifically target increasing exercise cognitions (and behaviour – Study 2) among a socially rejected (or lonely – Study 2) population. In conclusion, the results of this study point to the possibility that interventions guided by belongingness theory may be useful in not only reducing feelings of social rejection among dispositionally lonely people, but they may also support their adoption of exercise behaviours, at least in the short term. While it would certainly be premature to speculate whether such interventions might have any sustained (i.e., maintenance) effects, as the scope of this study was restricted to a 2-week sampling frame, future research would appear worthwhile that expands upon the intervention used in this study to test the longevity and generalizability of these effects to other at risk populations.

Chapter 3: *Go Girls!*: Psychological and Behavioural Outcomes Associated with a Group-Based Healthy Lifestyle Program for Adolescent Girls

Introduction

Adolescent girls are in particular need of effective programs that develop healthy lifestyle behaviours (Neumark-Sztainer, Story, Hannan, & Rex, 2003). The high prevalence of inactivity (Colley et al., 2011b) and poor dietary behaviours (Arbour-Nicitopoulos, Faulkner, & Irving, 2012) is a primary health concern for this population. For example, 30-50% of adolescent girls report no leisure-time physical activity (Kimm et al., 2002) and one in three Canadian adolescent girls do not meet current guidelines for fruit and vegetable consumption (Riediger, Shooshtari, & Moghadasian, 2007). In response to this public health issue, gender-specific lifestyle interventions have been developed for adolescent girls that target health behaviours, such as physical activity and eating, and cognitions towards those behaviours.

The majority of gender-specific lifestyle interventions for youth have tended to focus on the prevention or treatment of obesity (e.g., Waters et al., 2011; Wilfley et al., 2007). For example, Neumark-Sztainer and colleagues (2010) examined the effectiveness of a physical education program entitled ‘New Moves’ to target health behaviours and body image among adolescent girls at risk of overweight and obesity. Results from this study (Neumark-Sztainer et al., 2010) indicate that after completing the program, girls reported significant improvements in portion control, reductions in sedentary behaviour, increases in their physical activity self-efficacy and self-reported psychological “stage of change” for both dietary and physical activity behaviours (cf. Prochaska & Velicer, 1997, transtheoretical model of behaviour change). However, no significant changes were found for physical activity behaviour or quality of dietary intake (e.g., consumption of fruit and vegetables, sugar-sweetened beverages). Similarly,

findings from another school-based lifestyle program for adolescent girls indicated improvements in girls' cognitions (e.g., health behaviour intentions, dietary knowledge) but no changes in physical activity or dietary behaviour after completing the program (Story et al., 2003).

In light of the limited effectiveness of these programs, theory-based research is needed to target *behaviour* change. Specifically, the social context has been identified as an important factor to consider when developing programs to target adolescent girls' behaviours. For example, interpersonal connections have been highlighted as particularly important for overcoming the unique challenges faced by adolescent girls (Gilligan, 1982; Goodenow, 1993; Ma & Huebner, 2008). In particular, when girls experience positive connections to their school, peers or important adults (e.g., teachers, mentors, etc.), this has been found to be positively associated with adolescent girls' academic motivation and performance (Furrer & Skinner, 2003; Goodenow, 1993; Phan, 2013). Thus, programs that target girls' health behaviours within a context that promotes a sense of belonging (i.e., positive interpersonal connections) may be particularly effective for adolescent girls. The overall purpose of this study was to evaluate the effectiveness of a group-based healthy lifestyle program for adolescent girls, which specifically aims to foster a sense of belonging among the girls to group members and program mentors. This program is entitled *Go Girls! Healthy Minds Healthy Bodies*, or *Go Girls!* for short, and is run by member agencies of Big Brothers Big Sisters (BBBS) of Canada. Although the *Go Girls!* program has been widely disseminated across Canada over the past decade, this program has yet to be subject to comprehensive external (arms length) evaluation.

Drawing from social cognitive models of behaviour change (e.g., Ajzen, 1991; Bandura, 1977, 1986, 1997; Rosenstock, Strecher, & Becker, 1988), the *Go Girls!* program was designed

to provide experiential (social learning) opportunities to help girls adopt and maintain healthy lifestyles (i.e., physical activity and healthy eating behaviours as well as their attitudes toward these behaviours; see Methods for program description). The objectives of the *Go Girls!* program are targeted through weekly sessions with mentors in which girls are provided with an environment that is specifically created to encourage social connections amongst group members (Big Brothers Big Sisters of Canada, 2006). These connections are fostered through having adolescent girls meet with similar others in a caring, supportive and positive setting on a repeated basis (Baumeister & Leary, 1995; Big Brothers Big Sisters of Canada, 2006). Specifically, the program seeks to bolster girls' confidence in their abilities to self-manage both regular physical activity and healthy eating, by providing opportunities to learn from each other (i.e., vicarious experiences), master new healthy living behaviours (i.e., mastery experiences) and support each other (i.e., verbal persuasion). Thus, it was hypothesized that participants would report improvements (i.e., positive *change*) in self-regulatory efficacy to be both physically active and maintain a healthy diet. In light of consistent evidence that self-regulatory efficacy beliefs are related to improved physical activity behaviours (e.g., Araujo-Soares, McIntyre, & Sniehotta, 2009) and healthy dietary behaviours (e.g., Luszczynska, Gibbons, & Bettina, 2004), we also hypothesized that *Go Girls!* participants would display higher levels of health-enhancing (i.e., moderate-to-vigorous) physical activity and healthy eating by the end of the program, when compared to baseline, and that these effects would be sustained seven weeks after the program had ended.

Furthermore, the *Go Girls!* program also targeted the girls' instrumental attitudes (i.e., perceived health related benefits of the behaviour) and affective attitudes (i.e., how one will *feel* during or after engaging in the behaviour) towards healthy living behaviours. Specifically, *Go*

Girls! mentors attempt to convey the vision that engaging in regular physical activity and healthy eating is not only good for your health (i.e., instrumental attitudes), it can be fun too (i.e., affective attitudes). Thus, it was hypothesized that participants would report improvements in both affective and instrumental attitudes for both physical activity and healthy eating. Furthermore, across diverse literatures (Ajzen, 1991; Bandura, 1977, 1986, 1997; Rosenstock et al., 1988), attitudes toward a behaviour are positively related to goal intentions to perform the behaviour. Therefore, we also hypothesized that the girls would report improvements in intentions to engage in these behaviours by the end of the program, when compared to baseline, and that these effects would be sustained seven weeks after the program had ended.

In sum, evidence from a range of studies suggests that targeting key social cognitions (e.g., self-regulatory efficacy, attitudes, intentions) can lead to changes in behaviours. As highlighted by Glasgow (2013), a pragmatic approach to the assessment of the effectiveness of programs that aim to translate research into practice is warranted. Activities in the *Go Girls!* program are derived from evidence-based strategies to specifically target key health-enhancing cognitions among adolescent girls. Given the importance of increasing physical activity and improving healthy eating behaviours among adolescent girls, evaluation of programs that aim to improve these behaviours, such as *Go Girls!*, is warranted.

Method

Participants

In total, 344 *Go Girls!* participants agreed to participate in the study (age range 11-14 years, $M_{\text{age}} = 11.68$ years). Six participants dropped out part way through the study (one because she moved away and the other five did not provide a reason for dropping out). Eleven participants were excluded from the analyses because they were former *Go Girls!* participants,

one participant was excluded because she was unable to understand and complete the questions, eleven participants were excluded because the research assistant accidentally went 1 week early (i.e., data were collected at the end of the 6th session, not the final 7th session) and three participants were excluded because they told the research assistant they “just filled in their answers at random.” The participants came from 38 elementary or middle schools (40 groups in total as two schools ran two concurrent separate *Go Girls!* programs) in Southern Ontario (Canada). We followed procedures used by Statistics Canada in the 2006 Census and allowed participants to identify all ethnic/cultural groups with which they self-identified (i.e., girls could identify with more than one ethnic group). The largest represented ethnic groups were White (39.20%), Japanese (20.8%), Black (17.50%), and South Asian (e.g., East Indian, Pakistani; 9.6%). Eleven other ethnic groups were identified with a frequency of less than 5%.

Procedure

Institutional Review Board and School Board approval were obtained prior to the onset of this study. Participants were recruited through initial contact with *Go Girls!* program directors, school principals and school champions (i.e., the liaison between the schools and BBBS agencies). Specifically, once principals agreed to have their schools participate, mentors and their groups were subsequently invited to take part in the study, at which point active consent was obtained from both parents and girls separately. Participation (or not) in the study had no implication on the girl’s ability to participate in the *Go Girls!* program (i.e., girls could choose to not participate in the study and still complete the program). Trained research assistants collected the data at all four time points.

Study Design

This study was designed as a prospective observational outcome evaluation. Specifically, assessments were conducted approximately 7 weeks prior to beginning the program (Time 1 – data collected in December 2012 and January 2013), immediately prior to beginning the program (Time 2 – data collected in January and February 2013), immediately after completing the 7 week program (Time 3 – data collected in March and April 2013) and approximately 7 weeks after program completion (Time 4 – data collected in May and June 2013). An average of the scores collected at Time 1 and Time 2 (i.e., during which the girls did not receive any intervention), was utilized as the baseline comparison period to compare to scores reported at the end of the program (Time 3) and 7 weeks after the program ended (Time 4). In other words, by collecting baseline data approximately 7 weeks before the program started, we were able to obtain data from a pre-program comparison group without delaying the start of the *Go Girls!* program for this cohort (cf. Panagiotopoulos et al., 2011). Assessments took approximately 30 minutes to complete. Groups were given the sum of \$10 per participant (range from \$40-\$150 per group) to spend on a mutually agreed upon reward.

The Intervention: The *Go Girls!* Healthy Bodies, Healthy Minds Program

The *Go Girls!* program was developed by Ophea (Ontario Physical and Health Education Association) in 2001. Member agencies of BBBS of Canada currently implement the program in hundreds of schools across Canada

(<http://www.bigbrothersbigsisters.ca/en/home/mentoringprograms/gogirls.aspx>). Over the past

decade, thousands of adolescent girls have participated in the *Go Girls!* program⁹. The *Go Girls!* program is a 7 week program that is designed to consist of seven 2-hour weekly sessions (14 hours total), which are run by two female volunteers (i.e., the mentors). Mentors are 18-25 year old women who have an interest in physical activity, healthy eating and mentoring. Mentors are recruited and screened by BBBS agencies and trained by agency staff (Big Brothers Big Sisters of Canada, 2006). While the *Go Girls!* program was initially designed for girls who are not involved in extracurricular activities and/or school sports, to avoid stigmatization of the program, all girls who are interested in the program are eligible to participate. The *Go Girls!* program is delivered in all types of schools (e.g., public, private, Catholic, Christian, French) across Canada.

Adolescent girls meet with the *Go Girls!* mentors and 3-14 ($M_{group\ size} = 8.54, SD = 3.11$) other girls in a classroom provided by their school during or after school hours. Drawing from social cognitive theories (e.g., Ajzen, 1991; Bandura, 1977, 1986, 1997; Rosenstock et al., 1988), the sessions are designed to provide experiential (social learning) experiences to help girls adopt and maintain healthy lifestyles. Specifically, these sessions focused on physical activity, healthy eating practices and empowered girls to feel better about themselves. The program targeted key social cognitions (i.e., self-efficacy, instrumental and affective attitudes, social belonging) and behaviours (i.e., physical activity and healthy eating). See Table 3.1 for a summary of the weekly program content.

⁹ Teachers and/or school liaisons in participating schools ask adolescent girls if they would like to participate in the program. All adolescent girls in participating schools are eligible to participate in the program. There is no cost associated with participating in *Go Girls!*.

Table 3.1.

Summary of the Go Girls! Weekly Program Content

Week	Focus
1	Introduction to active living, balanced eating, feeling good about self, begin to develop relationships with the other girls and mentors.
2	Communication skills, engage in physical activity, discuss importance of eating fruits and vegetables.
3	Recognize social influences on body image, importance of eating breakfast, engage in physical activity.
4	Discuss self-esteem and body image, learn new physical activity, discuss importance of calcium, iron, fibre.
5	Help girls think about important issues (e.g., relationships, substance abuse, dieting), problem solving, engage in physical activity.
6	Goal setting, engage in physical activity, discuss healthy snack options.
7	Celebrate successes, develop strategies to maintain healthy lifestyle.

Measures

Go Girls! Program Belonging. In order to assess the extent to which the intervention created the social context as planned (i.e., the girls felt connected to one another), a measure of belonging to the *Go Girls!* program was administered immediately after the girls completed the program (Time 3) as a manipulation check. Sense of belonging to the *Go Girls!* program was assessed using the 5-item measure developed by Anderson-Butcher and Conroy (2002).

Participants were asked to rate how much they agree with each item using a 4-point scale with anchors NO! = 1, no = 2, yes = 3 and YES! = 4. This response format has been found to be easy to understand and differentiate between answers in samples with children and youth (Anderson-Butcher & Conroy, 2002). Sample items include “I feel comfortable at the *Go Girls!* program”

and “I feel committed to the *Go Girls!* program”. Items were summed and averaged to provide an indication of each participant’s mean belonging on a range of 1-4. Data derived from this measure provide evidence of acceptable reliability (Cronbach $\alpha = .93$; Anderson-Butcher & Conroy, 2002). In the present study, scores derived from this instrument displayed acceptable internal consistency (Cronbach $\alpha \geq .87$).

Physical activity behaviour. Participants’ *total physical activity behaviour* was assessed using a 2-item questionnaire suitable for use with adolescents (Prochaska, Sallis, & Long, 2001). These two items assessed the total amount of physical activity participants engaged in over the past week and over a typical week. These two items were summed and divided by 2 to get an average number of days per week that participants completed physical activity for at least 60 minutes (Prochaska et al., 2001; Tremblay et al., 2011). Scores derived from this 2-item measure demonstrated acceptable reliability at all four time points (Spearman-brown coefficient $\rho_s \geq .82$; Eisinga, Grotenhuis, & Pelzer, 2012).

Participants’ *leisure time physical activity behaviour* was assessed using 2 items from the World Health Organization Health Behaviour in School Children survey (World Health Organization, 1996). These two items assessed the amount of time spent each week (bouts per week) engaged in moderate-to-vigorous leisure-time physical activity. In the present study, scores derived from this instrument displayed acceptable internal consistency at all four assessments (Spearman-brown coefficient $\rho_s \geq .72$; Eisinga et al., 2012).

Adolescent Dietary Behaviours. Participants’ dietary behaviours were assessed using a revised version of the Adolescent Food Habits Checklist (Johnson, Wardle, & Griffith, 2002). Based on recommendations made by three independent dietitians, the questionnaire was revised by culling 6 items from the original 23-item questionnaire. Items were culled based on current

scientific evidence as certain items were identified as no longer being appropriate to assess “healthy” behaviours (i.e., such as the notion of avoiding all low-fat foods to be healthy). This revised 17-item questionnaire asked participants to report intake of fruit, vegetables and energy dense foods using a true/false response format. Four items also had an alternative response, equivalent to “not applicable”. Participants received one point for each healthy response and the final score was adjusted for not applicable and missing responses using the formula: AFHC scores = number of healthy responses * (17/number of items completed). Data derived from this measure have provided evidence of satisfactory reliability (Cronbach $\alpha = .83$; Johnson et al., 2002). In the present study, scores derived from this instrument displayed acceptable internal consistency at all four assessments (Cronbach $\alpha s \geq .70$).

Self-regulatory efficacy for physical activity. Participants’ confidence to self-regulate their physical activity behaviour was measured using a questionnaire developed by Shields, Spink, Chad, Muhjarine, Humbert and Odnokon (2008). Participants were asked to rate their confidence in their abilities to engage in six self-regulatory behaviours with regard to physical activity over the next week. Items were measured on a standard 0 percent (*not at all confident*) to 100 percent (*completely confident*) self-efficacy scale (McAuley & Mihalko, 1998). Item scores were summed and averaged to provide an indication of each participant’s mean efficacy out of 100 percent. Data derived from this measure have demonstrated acceptable reliability (Cronbach $\alpha = .85$; Shields et al., 2008). In the present study, scores derived from this instrument displayed acceptable internal consistency at all four assessments (Cronbach $\alpha s \geq .86$).

Self-regulatory efficacy for healthy eating. Participants’ confidence to engage in healthy eating was measured using a version modified for youth (Morton et al., 2011) of the questionnaire developed by Strachan and Brawley (2008). Participants were asked to rate their

confidence to engage in five self-regulatory behaviours that could help them eat healthfully over the next week. Items were measured on a standard 0 percent (*not at all confident*) to 100 percent (*completely confident*) self-efficacy scale (McAuley & Mihalko, 1998). Item scores were summed and averaged to provide an indication of each participant's mean efficacy out of 100 percent. Data derived from this instrument have demonstrated acceptable reliability (Cronbach $\alpha = .86$; Morton et al., 2011). In the present study, scores derived from this instrument displayed acceptable internal consistency at all four assessments (Cronbach $\alpha s \geq .89$).

Physical activity and healthy eating intentions. Participants' intentions to engage in physical activity were measured using a 3-item questionnaire developed by Chatzisarantis and colleagues (1997). Items were measured on a 7-point scale, with anchors ranging from 1 (*very unlikely*) to 7 (*very likely*). An exemplar item for physical activity intentions included "I intend to do physical activity at least three times next week". Participants' intentions to eat a healthy diet were measured using a similar 3-item questionnaire modified based on Chatzisarantis and colleagues' (1997) physical activity measure and Luszczynska and colleagues (2007). An exemplar item for healthy eating intentions included "I intend to eat a healthy diet every day next week". In the present study, scores derived from these instruments displayed acceptable internal consistency at all four assessments (physical activity: Cronbach $\alpha s \geq .91$; healthy eating: Cronbach $\alpha s \geq .89$).

Physical activity and healthy eating affective attitudes. Participants' instrumental and affective attitudes toward physical activity and healthy eating were assessed using two separate 6-item measures (Ajzen, 2002; Ajzen & Fishbein, 1980). All items began with the stem "For me, physical activity/healthy eating would be...". Participants were asked to respond using separate 7-point semantic differential scales based on their expectations that either engaging in physical

activity or healthy eating will lead to affective and instrumental outcomes. Items designed to assess instrumental attitudes include “Useful—Useless”, “Wise—Foolish”, and “Beneficial—Harmful”, and items designed to assess affective attitudes include “Enjoyable—Unenjoyable”, “Pleasant—Unpleasant”, and “Interesting—Boring”. Answers were summed for each subscale and the mean value for each subscale was calculated. Higher mean values represent more positive instrumental and affective attitudes. Data collected using the physical activity questionnaire with adolescents provide evidence for acceptable levels of reliability (Backman, Haddad, Lee, Johnston, & Hodgkin, 2002; Nasuti & Rhodes, 2013). In the present study, scores derived from this instrument displayed acceptable internal consistency at all four assessments (physical activity instrumental attitudes: Cronbach α s $\geq .81$; physical activity affective attitudes: Cronbach α s $\geq .83$; healthy eating instrumental attitudes Cronbach α s $\geq .86$; healthy eating affective attitudes Cronbach α s $\geq .84$).

Data Analysis

A moderate proportion of missing data were found across all the study variables (14.25%-24.60%). A missing value analysis was conducted using SPSS (Version 20), which indicated that the assumption of Missing Completely at Random (MCAR) was met. Specifically, Little’s (1988) chi-square test of MCAR was non-significant, $\chi^2(2023) = 2028.11, p > .05$. In the subsequent models, a Full Information Maximum Likelihood approach to model estimation was used. Data were analysed with mixed effects models using Hierarchical Linear Modelling software (HLM, student version 7.0) controlling for the nested nature of the data (i.e., repeated measures within individuals, and girls within groups, Hox, 2002).

Results

Girls attended on average 91% of the 7 sessions (range 3-7 sessions attended). Sessions were on average 78 minutes long (range 40-135 minutes) and total program minutes were on average 534 minutes (range 280-910 minutes). The intraclass correlation coefficients (ICC) for the group-level variation are presented in Table 3.2. These data suggest that the majority of variance in scores was observed at the individual level (group level ICCs $\leq .103$). Scores from the *Go Girls!* sense of belonging measure (i.e., the manipulation check) confirmed that on average, the girls felt a sense of belonging to the *Go Girls!* group ($M = 3.74$, $SD = 0.40$; range 2.0-4.0). Coefficients, standard errors and effect sizes are presented in Table 3.3.

Table 3.2.

Intraclass Correlation Coefficients (ICC) for Outcome Variables

Variable	ICC
PA Total	0.038
PA Leisure	0.050
HE Behaviour	0.072
Intentions – PA	0.065
Intentions – HE	0.096
IA – PA	0.086
AA – PA	0.022
IA – HE	0.103
AA – HE	0.085
SRE – PA	0.073
SRE – HE	0.028

Note. PA stands for physical activity, HE stands for healthy eating, IA stands for instrumental attitudes, AA stands for affective attitudes, SRE stands for self-regulatory efficacy.

Table 3.3.

Hierarchical Linear Modelling Analyses for Changes in Outcomes Over Time

Variable	Time 1 – Time 2			Avg T1-T2 vs. Time 3				Avg T1-T2 vs. Time 4			
	<i>Parameter</i>	<i>Coeff.</i>	<i>SE</i>	<i>Parameter</i>	<i>Coeff.</i>	<i>SE</i>	<i>Effect Size</i>	<i>Parameter</i>	<i>Coeff.</i>	<i>SE</i>	<i>Effect Size</i>
PA Total	γ_{100}	-0.07	0.06	γ_{200}	0.11	0.07	0.48	γ_{300}	0.33***	0.07	1.57
PA Leisure	γ_{100}	-0.01	0.04	γ_{200}	0.11**	0.04	1.01	γ_{300}	0.24***	0.06	1.38
Diet Behaviour	γ_{100}	-0.02	0.08	γ_{200}	0.20	0.12	0.51	γ_{300}	0.31*	0.14	0.71
SRE – PA	γ_{100}	0.09	0.60	γ_{200}	0.10	0.87	0.04	γ_{300}	3.79***	0.88	1.38
SRE – Diet	γ_{100}	0.66	0.52	γ_{200}	1.92*	0.79	0.78	γ_{300}	0.43	1.02	0.13
PA Intentions	γ_{100}	-0.01	0.04	γ_{200}	0.09	0.06	0.44	γ_{300}	0.13*	0.06	0.65
Diet Intentions	γ_{100}	0.02	0.04	γ_{200}	0.02	0.06	0.11	γ_{300}	0.11	0.06	0.59
IA – PA	γ_{100}	-0.02	0.06	γ_{200}	-0.07	0.05	0.43	γ_{300}	0.05	0.06	0.27
AA – PA	γ_{100}	0.03	0.05	γ_{200}	-0.11*	0.05	0.75	γ_{300}	0.01	0.05	0.04
IA – Diet	γ_{100}	-0.01	0.04	γ_{200}	0.07	0.06	0.43	γ_{300}	-0.23***	0.06	1.32
AA – Diet	γ_{100}	-0.04	0.06	γ_{200}	-0.01	0.06	-0.01	γ_{300}	-0.04	0.06	-0.23

Note. PA stands for physical activity, SRE stands for self-regulatory efficacy, IA stands for instrumental attitudes, AA stands for affective attitudes, SE stands for self-efficacy. Standardized regression coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Changes in Outcomes Over Time

Before the program. As hypothesized, there were no significant changes during the baseline assessment period (Time 1 – 2) for physical activity or healthy eating, self-regulatory efficacy for physical activity and healthy eating, affective or instrumental attitudes for physical activity and healthy eating, or physical activity and healthy eating intentions, the absolute values of $ts \leq 1.27$, $ps \geq .21$ (see Figures 3.1-3.3 for changes in psychosocial outcomes over time and Figure 3.4 for changes in behavioural outcomes over time).

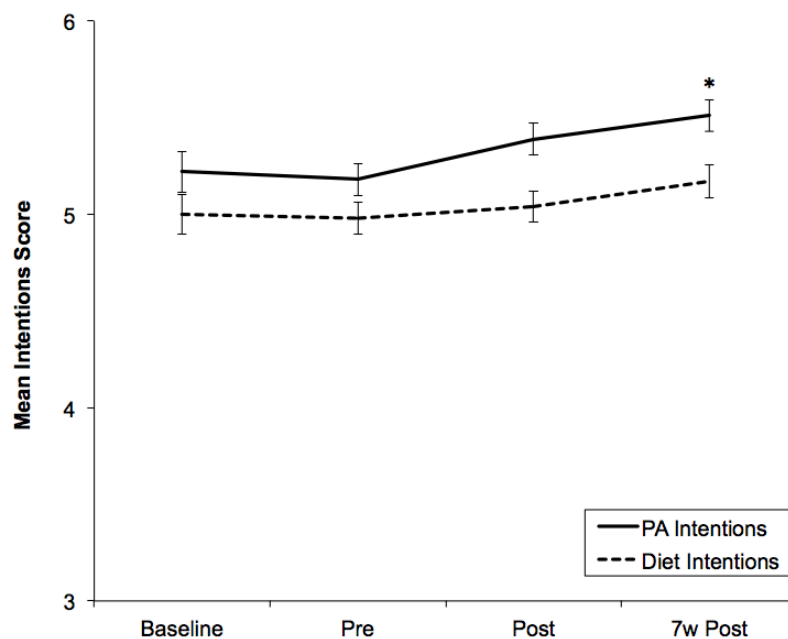


Figure 3.1. Changes in behavioural intentions over time. Changes between Time 1 – Time 2 represent the initial baseline assessment period during which the girls did not receive any intervention (i.e., the average score from these data served as a pre-program comparison to Post and 7w Post scores). PA stands for physical activity. Error bars represent standard error.

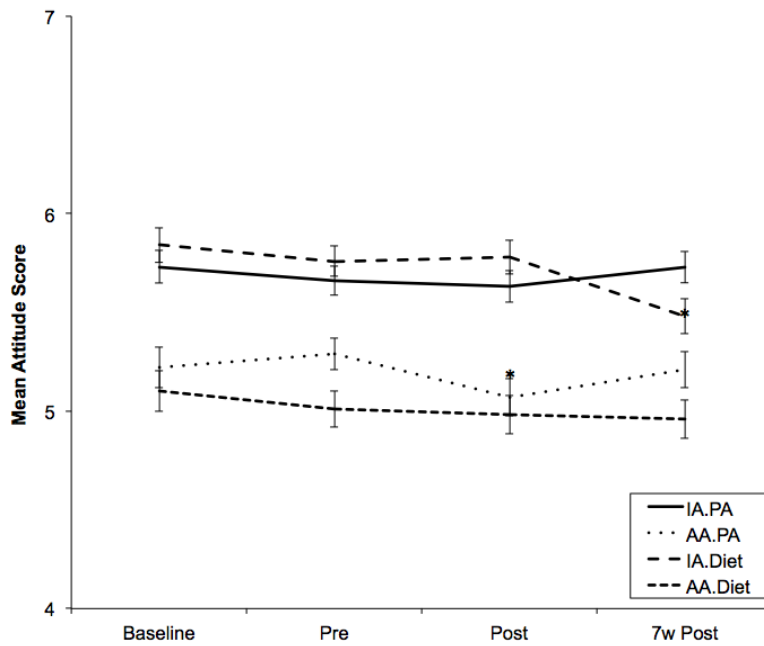


Figure 3.2. Changes in attitudes over time. IA stands for instrumental attitudes, AA stands for affective attitudes. PA stands for physical activity. Error bars represent standard error.

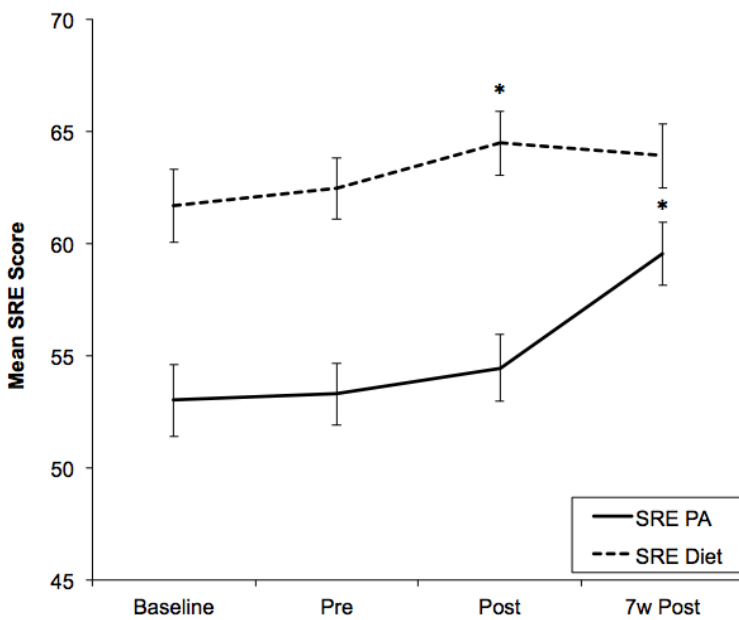


Figure 3.3. Changes in self-regulatory efficacy over time. SRE stands for self-regulatory efficacy. PA stands for physical activity. Error bars represent standard error.

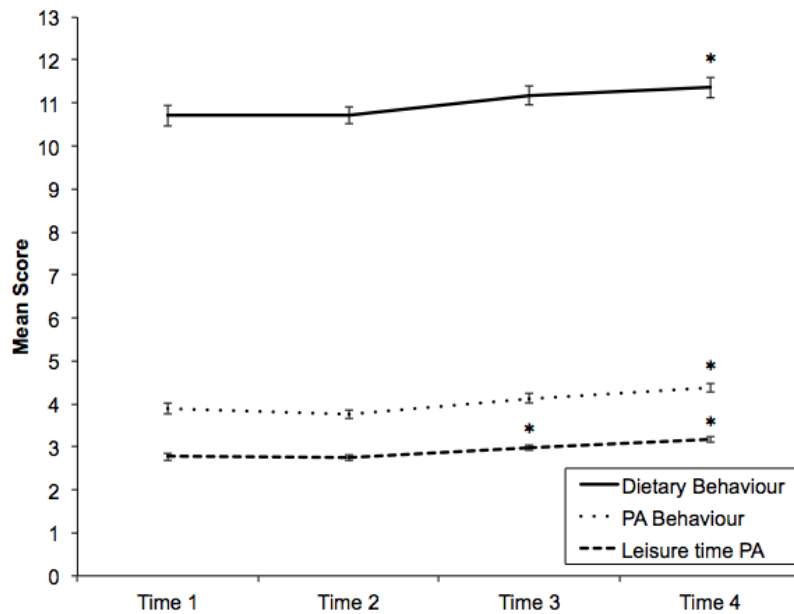


Figure 3.4. Changes in behavioural outcomes over time. PA stands for physical activity. Error bars represent standard error.

Immediately after the program. Consistent with our hypothesis, compared to the mean of the scores at Time 1 and Time 2, there were significant improvements in leisure time physical activity behaviour and self-regulatory efficacy for healthy eating immediately after the *Go Girls!* program, $ts \geq 2.44$, $ps \leq .02$, $ds \geq 0.78$ ¹⁰. While means were in the hypothesized direction, increases in physical activity and dietary intentions, total physical activity and healthy eating behaviour were not significant at the end of the program (Time 3), $ts \geq 1.38$, $ps \leq .17$. Contrary to our hypothesis, there were significant reductions in the girls' affective attitudes towards physical activity, $t = -2.33$, $p = .007$, $d = -0.75$ and there were no significant changes in self-

¹⁰ Note that effect sizes may be over-estimated due to the correction for repeated measures (over time) and the nesting effect of girls in groups (Dunlap, Cortina, Vaslow, & Burke, 1996).

regulatory efficacy for physical activity and the other attitudes immediately after program completion (Time 3), $ts \leq 1.35$, $ps \geq .19$.

Seven weeks after the program. As hypothesized, compared to the mean of the scores at Time 1 and Time 2, seven weeks after the program had ended (Time 4), there were significant improvements in healthy eating and physical activity behaviour (leisure time and total physical activity), physical activity intentions and self-regulatory efficacy for physical activity, $ts \geq 2.04$, $ps < .05$, $ds \geq 0.44$. While means were in the hypothesized direction, no significant improvement in dietary intentions was found, $t = 1.84$, $p = .07$. However, contrary to our hypothesis, compared to the mean of the scores at Time 1 and Time 2, there were significant decreases in instrumental attitudes for healthy eating seven weeks after program completion (Time 4), $t = -4.12$, $p = .001$, $d = 1.32$ and there were no significant changes in the other psychosocial variables (self-regulatory efficacy for healthy eating and all other attitude measures), $ts \leq 0.83$, $ps \geq .41$.

Discussion

The purpose of this study was to examine changes in health enhancing social cognitions and behaviours among a sample of adolescent girls who participated in a group-based lifestyle intervention. Most importantly, from a program effectiveness perspective, significant increases in reported leisure time physical activity were maintained 7 weeks after program completion. Furthermore, 7 weeks after the program ended, participants reported improved healthy eating behaviour (i.e., diet quality) and engaging in more total physical activity compared to before the program. These findings are noteworthy because previous lifestyle programs for girls have only found changes in cognitions (and not in healthy behaviours; Neumark-Sztainer et al., 2010; Story et al., 2003). In addition to the reported improvements in physical activity and healthy eating behaviours, *Go Girls!* participants also reported enhanced self-regulatory efficacy for healthy

eating (at Time 3) and physical activity (at Time 4) and physical activity intentions (Time 4).

From a public health perspective, it is particularly noteworthy that 7 weeks post program completion participants reported significant improvements in the health behaviours (i.e., physical activity and healthy eating) targeted in the *Go Girls!* program when compared to baseline measures.

One of the unique elements of the *Go Girls!* program is the emphasis on fostering a sense of connection (i.e., belonging) among the girls and with the mentors. Indeed, as confirmed by the manipulation check used in this study, by the end of the program the girls reported feeling a strong sense of belonging to the *Go Girls!* program. Based on previous research that highlights the importance of fostering interpersonal relationships when working with girls (Gilligan, 1982; Goodenow, 1993; Ma & Huebner, 2008), it is plausible to suggest that fostering a sense of belonging may have contributed to the effectiveness of the *Go Girls!* program. Of course, as we were only able to measure belonging to the *Go Girls!* program at the end of the program (because the girls could not have reported their belonging to a program before it started), we were unable to examine the extent to which *changes* in belonging led to *changes* in the outcomes targeted in the *Go Girls!* program. Indeed, this notion represents an important area of future research as *changes in social connections* over the course of a youth sport program have been found to be positively associated with *changes in social cognitions* (Ullrich-French, McDonough, & Smith, 2012). Nevertheless, when taken together, these findings are important because they suggest that programs designed to foster social connections among adolescent girls may provide a suitable environment to develop health enhancing social cognitions and behaviours among this population.

Contrary to our hypothesis, we did not find any significant improvements in the girls' healthy eating intentions, although the means were in the hypothesized direction. It is possible that this finding is due to the measurement of healthy eating intentions. Specifically, healthy eating intentions were assessed using a questionnaire that asked girls to what degree they intended, planned and were determined to eat a healthy diet *every day over the next week*. In consideration of the physical activity intentions measure which asked girls if they intended, planned and were determined to do physical activity *at least 3 times over the next week* (and did detect significant improvements in physical activity intentions), it is possible that the healthy eating intentions measure was not sensitive to (potential) changes in the girls' healthy eating intentions. In light of the adolescent girls' improved dietary behaviour reported in the current study, future research is warranted to examine changes in dietary intentions using a less stringent standard for healthy eating (e.g., at least 3 times over the next week).

Furthermore, and again contrary to our hypotheses, we did not find any positive changes in instrumental attitudes for physical activity or affective attitudes for healthy eating, and indeed affective attitudes towards physical activity and instrumental attitudes towards healthy eating declined. These findings suggest that strategies that were used to make physical activity fun for the girls (i.e., affective attitudes) and help them understand why healthy eating is important (i.e., instrumental attitudes) could be improved in the *Go Girls!* program. It is noteworthy that the results for the attitudinal variables did not align with the behavioural measures for physical activity and diet (which both improved), or the other social cognitive measures (e.g., self-regulatory efficacy, and intentions) assessed in this study. Disentangling such a discrepancy would represent an interesting direction in any future research.

Balanced against the findings reported in this study, several limitations should be acknowledged. First, although we collected baseline assessments over a 7-week period before the *Go Girls!* program began, we did not collect data from a separate control group. It is noteworthy that there were no changes over the baseline period (during which the girls did not receive any intervention), and we did find changes in most of the outcomes immediately after and/or seven weeks after program completion. Nevertheless, in the future, the use of experimental designs that include an appropriate parallel control group would appear necessary. Second, the outcome variables were all self-reported and subject to bias. Future studies using objective measures to assess outcomes (e.g., accelerometers to assess physical activity) or reports from others (e.g., mentors, parents or teachers) on the girls' changes in cognitions and behaviours would be beneficial. Third, while it is noteworthy that increases in both physical activity and healthy eating behaviour were maintained at follow-up, this post-program assessment period was restricted to a 7-week sampling frame. Future research could explore the extent to which any acute effects of the *Go Girls!* program are sustained over a longer time frame (e.g., 6 months, 1 year).

Despite these limitations, the findings of this study are noteworthy for a number of reasons. First, we found medium-large size effects for the significant improvements in both physical activity and dietary behaviours over time. Second, this was the first study to examine the effectiveness of the *Go Girls!* program, which demonstrates considerable 'reach' (cf. Glasgow, Vogt, & Boles, 1999) whereby thousands of adolescent girls participate in the program across Canada every year. Indeed, one of the biggest strengths of the study is that because we collected data from a large, representative sample of *Go Girls!* participants, the findings are generalizable to other similar programs implemented in similar contexts (i.e., urban communities

in Canada). Given the preliminary evidence for the effectiveness of the *Go Girls!* program, future research is warranted to examine the extent to which an adapted version of the *Go Girls!* program could be beneficial for older adolescent girls (e.g., high school girls). Third, the use of hierarchical linear modelling represents a noted strength of the study because this analytic approach is well suited for missing data and examining changes over time and accounts for the nested nature of the data.

In conclusion, findings from the current study suggest that adolescent girls who participated in the *Go Girls!* program reported improvements in health-enhancing cognitions and behaviours. These findings provide evidence for the continued implementation of programs that foster belongingness and target health behaviour change through mentorship models. In particular, such programs appear to represent a viable means to improve health-enhancing behaviours among adolescent girls. Building on this preliminary positive evidence, future field-based experimental research using adequate comparison groups is warranted to establish causal effects of this program.

Chapter 4: Psychosocial Predictors of Adolescent Girls' Physical Activity and Dietary Behaviours After Completing the *Go Girls!* Group-Based Mentoring Program

Introduction

When considered against Canada's physical activity (Tremblay et al., 2011) and dietary guidelines (Health Canada, 2011), adolescent girls are particularly at risk for negative health consequences because of low levels of health-enhancing behaviours. For example, only 33% of adolescent girls (ages 11-14) engage in at least 60 minutes of moderate-to-vigorous physical activity at least 3 days per week (Colley et al., 2011b). Furthermore, one third of Canadian adolescent girls do not meet the recommended guidelines for fruit and vegetable consumption (Riediger et al., 2007). Theory-based health promotion programs that foster sustained engagement in these health-enhancing behaviours among adolescent girls represent an important focus for public health initiatives.

There is increasing evidence that social belonging appears to be a key component of programs for adolescent girls as this provides a positive environment to target program outcomes (Gilligan, 1982; Goodenow, 1993; Hirsch et al., 2000; Loder & Hirsch, 2003; Ma & Huebner, 2008). Among a variety of program frameworks, mentorship-based models may work particularly well for adolescent girls because of their focus on the development of social connections. Indeed, J. E. Rhodes (2005) suggested that the basic component of effective mentoring programs is the development of connections between the mentor(s) and mentee(s). J. E. Rhodes and DuBois (2008) explain that "beneficial effects [on outcomes targeted in youth] are expected only to the extent that the mentor and youth forge a strong connection that is characterized by mutuality, trust and empathy. For this bond to arise, mentors and youth are

likely to need to spend time together on a consistent basis over some significant period of time” (p. 255). In sum, feeling a sense of connection to the mentoring group may be an important contextual factor for health promotion programs that target adolescent girls’ health behaviours.

Given the importance of regular engagement in physical activity and healthy eating, programs that lead to sustained engagement in these behaviours *after program completion* are vital. For example, drawing from the group dynamics literature, group-mediated cognitive behavioural programs (Brawley et al., 2000) that teach techniques for behaviour change lead to improvements in physical activity behaviour in the short-term (i.e., during and immediately after program completion), as well as sustained engagement *after* the program has ended (follow-ups range from 1-6 months; Brawley et al., 2000; Cramp & Brawley, 2009; Wilson et al., 2012). Brawley and colleagues (2000) theorize that sustained engagement in the new behaviour (i.e., physical activity in these studies) was due to fostering key social cognitions (e.g., self-efficacy) within a cohesive environment, such that the group is used as an agent of change (i.e., group processes help participants in the program work towards individual and group goals). Such group-based behaviour change programs that target important social cognitions in a socially connected environment may represent a viable model for health promotion initiatives designed to foster sustained engagement in health behaviours among adolescent girls.

The Present Study

Of direct relevance to the current study, Big Brothers and Big Sisters (BBBS) of Canada offers a program called *Go Girls! Healthy Minds, Healthy Bodies*, or *Go Girls!* for short, and is a program designed to increase healthy eating and physical activity among adolescent girls. This program has been delivered to thousands of adolescent girls across Canada over the past decade. Similar to group-mediated cognitive-behavioural interventions (Brawley et al., 2000), the *Go*

Girls! program is underpinned by the tenets of social cognitive theories (Ajzen, 1991; Bandura, 1986) to target key social cognitions (e.g., positive attitudes, self-efficacy, intentions) within a cooperative environment and through activities that promote social connections, physical activity and healthy eating. Specifically, in this program, the girls learn to work together, learn more about each other, and develop connections with one another (i.e., fostering social belonging among the girls and with the mentors). Drawing from mentoring theory (J. E. Rhodes, 2005), it is suggested that the creation of a safe, supportive and connected environment enables participants to develop important health-enhancing cognitions and behaviours in the program.

Findings from the outcome evaluation of the *Go Girls!* program (chapter 3; Dowd, Chen, Jung, & Beauchamp, 2014) provide support for the positive effects of a supportive environment, as the participants on average reported feeling a strong sense of belonging to their group, and showed improvements in some of the targeted social cognitions (i.e., self-regulatory efficacy and intentions) and behaviours (physical activity and diet) at the end of the program and/or at 7 week follow-up. Building on the findings from this outcomes evaluation, the overall purpose of the current study was to examine if adolescent girls' health-enhancing social cognitions at the end of the program predict their behaviours (physical activity and healthy eating) 7 weeks after program completion.

A framework that has been widely utilized to understand health behaviours and guide behaviour change interventions is the theory of planned behaviour (TPB; Ajzen, 1991). Ajzen postulates that intentions are the most proximal predictor of behaviour. Furthermore, attitudes, perceptions of subjective norms and perceived behavioural control are theorized to influence intentions to engage in a behaviour, and both intentions and perceived behavioural control

directly predict behaviour. These theory-based health-enhancing social cognitions are targeted through activities over the course of the *Go Girls!* program.

Drawing from the TPB, attitudes toward a behaviour are theorized to predict intentions to engage in the behaviour (Ajzen, 1991). Over the past decade, researchers have begun to note the important distinction between affective and instrumental attitudes. Affective attitudes relate to how one thinks engaging in a behaviour will make them *feel*, whereas instrumental attitudes refer to anticipated *costs* and *benefits* from engaging in a behaviour (R. E. Rhodes & Conner, 2010; R. E. Rhodes et al., 2009). In line with research that suggests that attitudes are an important predictor of behaviour (Nasuti & Rhodes, 2013), the *Go Girls!* program delivers activities that promote opportunities for the girls to enjoy engaging in healthy behaviours, while also ensuring girls understand the benefits of healthy living (i.e., instrumental attitudes). As such, it was hypothesized that both affective and instrumental attitudes would indirectly predict behaviour through intentions to engage in physical activity and healthy eating behaviour.

Additionally, in the TPB, it is suggested that subjective norms (i.e., a person's perception of an important referent groups' thoughts towards the person engaging in a behaviour) predict one's intentions to engage in that behaviour. Throughout the *Go Girls!* program, the girls are involved in activities that promote positive subjective norms towards both physical activity and healthy eating. Although subjective norms are hypothesized to predict behaviour (Ajzen, 1991), researchers often fail to find a strong relationship between subjective norms and intentions (or behaviour). As an explanation, Armitage and Conner (2001) suggest that previous research findings that report subjective norms are a weak predictor of intentions and/or behaviour are typically limited by poor measurement (i.e., single-item measures) and incongruent conceptualization (i.e., different types of social norms may be more relevant for different

populations and behaviours). By using a validated multi-item measure and assessing injunctive subjective norms (Cialdini, Kallgren, & Reno, 1991), we hypothesized that subjective norms would indirectly predict physical activity and healthy eating behaviour through intentions.

Ajzen (1991) also suggested that one's perceived behavioural control predicts behaviour both directly and indirectly (through intentions). However, it has been recommended that self-efficacy should be assessed rather than perceived behavioural control (Armitage & Conner, 1999; Rodgers, Wilson, Hall, Fraser, & Murray, 2008). While perceived behavioural control refers to perception of control over *general external factors* that affect engagement in a given behaviour, self-efficacy corresponds to a belief in one's capabilities to perform a given behaviour (Bandura, 1997) and as such represents a perception of control over *internal factors* (Armitage & Conner, 1999). In line with the sources of self-efficacy posited by Bandura (1997), activities within the *Go Girls!* program target physical activity and healthy eating behaviour through the provision of opportunities for (a) mastering these behaviours, (b) social learning from others and (c) verbal support from the mentors and the other participants. Indeed, research drawing from social cognitive theories of behaviour change indicates that one of the most important predictors of behaviour is a person's confidence in his or her ability to engage in self-regulation (i.e., self-regulatory efficacy) necessary for the behaviour (Araujo-Soares et al., 2009; Luszczynska et al., 2004). Thus, it was hypothesized that participants' self-regulatory efficacy would directly and indirectly (through intentions) predict engagement in physical activity and healthy eating behaviour.

Finally, drawing from the TPB, intention to engage in a behaviour is the most proximal predictor of behaviour. Indeed, findings from a recent meta-analysis suggest that intentions to engage in behaviour predict both physical activity and dietary behaviour (McEachan, Conner,

Taylor, & Lawton, 2011). Bandura (1986) suggests that people intend to engage in behaviours they have positive perceptions towards and are confident they can complete. Given that the *Go Girls!* program targets attitudes, subjective norms and self-efficacy, it follows that behavioural intentions are also targeted in the program. Therefore, it was hypothesized that intentions at the end of the program would predict physical activity and healthy eating behaviour 7 weeks after the program has ended.

In sum, programs that target intentions, attitudes, subjective norms, and self-regulatory efficacy have the potential to be effective in leading to sustained engagement in physical activity and healthy dietary behaviours among adolescent girls. Furthermore, research suggests that fostering social connections (i.e., a sense of belonging) is an important component of programs that target behaviour change among adolescent girls. The overall goal of the current study was to examine the extent to which key TPB-derived social cognitions assessed at the end of a group-based mentoring lifestyle program that promoted social connectedness among adolescent girls, predicted both physical activity and dietary behaviour 7 weeks after the participants completed the program. The hypothesized path models for both behaviours can be found in Figures 4.1 and 4.2.

Method

Participants

Two hundred and thirty-seven adolescent girls responded to questionnaires at both time points examined in this study (i.e., at the end of the *Go Girls!* program and 7 weeks after program completion; $M_{\text{age}} = 12.24$ years, $SD = 0.80$, range 11-14 years). The same participants that were sampled in Chapter 3 were used in this study as well. The *Go Girls!* program is run by member agencies of BBBS of Canada. Participants represented 37 *Go Girls!* groups from

elementary or middle schools in Southern Ontario, Canada. Procedures used by Statistics Canada in the 2006 Census were followed as participants were asked to identify all ethnic/cultural groups with which they self-identified (i.e., girls could identify with more than one ethnic group). The most common ethnic groups reported were White (27.70%), Black (15.20%), and South Asian (e.g., East Indian, Pakistani; 8.40%). Eleven other ethnic groups were identified with a frequency of less than 5%.

Procedure

Institutional Ethical Review Board and School Board approval were obtained prior to commencing this study. Schools were initially asked to participate in the current study by program directors. Once schools had agreed to participate in this study, participants were then recruited through school principals and school champions (i.e., the liaison between the schools and BBBS agencies) and program directors. Active consent was obtained from both parents and girls separately. Trained research assistants collected the data. This study was designed as a prospective observational assessment of TPB-derived social cognitions (i.e., attitudes, subjective norms, self-regulatory efficacy and intentions) measured at the end of the program in relation to behaviours (i.e., physical activity and healthy eating) 7 weeks later. Questionnaires took approximately 30 minutes to complete. Groups were given the sum of \$10 per participant (range from \$40-\$150 per group) to spend on a mutually agreed upon reward.

The Intervention: The *Go Girls!* Healthy Bodies, Healthy Minds Program

Go Girls! is a 7-week program that consists of 2-hour weekly sessions (14 hours total), with each session run by two female volunteers mentors. BBBS recruits and screens mentors who are trained by agency staff (Big Brothers Big Sisters of Canada, 2006). Mentors are women (aged 18-25) who have an interest in healthy/active living and mentoring. Participants meet with

the mentors and 3 to 14 ($M_{group\ size} = 8.54$, $SD = 3.11$) other girls in a classroom provided by each school. The sessions were designed using social cognitive theories of behaviour change (Ajzen, 1991; Bandura, 1986; Rosenstock et al., 1988) to provide opportunities for social learning to help girls adopt and maintain healthy lifestyles.

Measures

Go Girls! Program Belonging. The 5-item measure developed by Anderson-Butcher and Conroy (2002) was used to measure the participants' sense of belonging to the *Go Girls!* program as a manipulation check. Items were measured using a 4-point scale with anchors NO! = 1, no = 2, yes = 3 and YES! = 4. This response format has been found to be easy to understand and differentiate between youth's answers (Anderson-Butcher & Conroy, 2002). Exemplar items include "I feel accepted at the *Go Girls!* program" and "I feel committed to the *Go Girls!* program". Responses to items were summed and averaged to provide a score of each participant's sense of belonging to the program. Scores range from 1-4, with higher scores representing a greater sense of belonging to the program. Data derived from this measure have been found to provide evidence of acceptable reliability (Cronbach $\alpha = .93$; Anderson-Butcher & Conroy, 2002). In the present study, scores derived from this measure were found to be internally consistent with an ordinal coefficient alpha (Zumbo, Gadermann, & Zeiser, 2007) of 0.95.

Physical activity behaviour. A 2-item questionnaire, validated for use with adolescents, was used to assess participants' *total physical activity behaviour* (Prochaska et al., 2001). These two items assessed the total amount of physical activity participants engaged in over a typical week and over the past week. Higher scores represent engagement in more physical activity per week. In the present study, Spearman-Brown coefficient ρ was .88 (Eisinga et al., 2012).

Adolescent dietary behaviours. A revised version of the Adolescent Food Habits Checklist (AFHC) was used to assess participants' dietary behaviours (Johnson et al., 2002). Three independent dietitians reviewed the original questionnaire and made recommendations to cull items based on current scientific evidence as certain items were identified as no longer appropriate to assess "healthy" behaviours (i.e., such as the notion of avoiding all low-fat foods to be healthy). Based on the dietitians' recommendations, six items were culled from the original 23-item questionnaire. The revised 17-item questionnaire asked participants to report intake of vegetables, fruits, and energy dense foods using a true/false response format. An alternative response, equivalent to "not applicable", was available for four items. Respondents received one point for each healthy response and the final score was adjusted for missing responses and not applicable using the formula: AFHC scores = number of healthy responses * (17/number of items completed). Higher scores indicate engagement in more healthy dietary behaviours. Data derived from the AFHC have provided evidence of satisfactory reliability (Johnson et al., 2002). In the present study, scores derived from the revised AFHC were found to be internally consistent with Cronbach $\alpha = 0.80$.

Physical activity and healthy eating attitudes. Two separate 6-item measures were used to assess participants' affective and instrumental attitudes toward physical activity and healthy eating using procedures outlined by Ajzen (2002). All items began with the stem "For me, physical activity/healthy eating would be...". Participants were asked to respond to items using separate 7-point semantic differential scales based on their expectations that either engaging in physical activity or healthy eating will lead to affective and instrumental outcomes. Items designed to measure affective attitudes include "Enjoyable—Unenjoyable", "Pleasant—Unpleasant", and "Interesting—Boring" and items designed to measure instrumental attitudes

include “Useful—Useless”, “Wise—Foolish”, and “Beneficial—Harmful”. In the assessment of adolescents’ attitudes towards physical activity, measures derived from this assessment have been found to demonstrate good internal consistency (Backman et al., 2002; Nasuti & Rhodes, 2013). In the present study, ordinal α (Zumbo et al., 2007) internal consistency reliability coefficients for these measures were ≥ 0.88 .

Subjective norms for physical activity and healthy eating. Participants’ perceptions of their group members’ normative beliefs toward the participants’ engagement in physical activity and healthy dietary behaviour were examined through an adapted version of the 3-item subjective norms measure developed by Baker, Little and Brownell (2003). Participants were asked to rate the extent to which they agreed with the items on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*). Sample items include “Members of my *Go Girls!* group would approve if I did regular physical activity” and “Members of my *Go Girls!* group think I should eat healthily”. Data derived from this measure have demonstrated acceptable reliability (Cronbach $\alpha = .87$, Baker et al., 2003). In the present study, ordinal α (Zumbo et al., 2007) internal consistency reliability coefficients for these measures were ≥ 0.71 .

Self-regulatory efficacy for physical activity. A 6-item measure was used to examine participants’ confidence to self-regulate their physical activity behaviour (Shields et al., 2008). Participants were asked to respond to items regarding their self-regulatory abilities for physical activity on a standard 0 percent (*not at all confident*) to 100 percent (*completely confident*) self-efficacy scale (McAuley & Mihalko, 1998). Data derived from this measure have demonstrated acceptable reliability (Cronbach $\alpha = .85$; Shields et al., 2008). In the present study, Cronbach α internal consistency reliability coefficient was 0.91.

Self-regulatory efficacy for healthy eating. Participants' confidence to engage in healthy eating was measured using a version of the questionnaire developed by Strachan and Brawley (2008) modified for youth (Morton et al., 2011). Participants were asked to respond to items regarding their self-regulatory abilities for healthy eating on a standard 0 percent (*not at all confident*) to 100 percent (*completely confident*) self-efficacy scale (McAuley & Mihalko, 1998). Data derived from this instrument have demonstrated acceptable reliability (Morton et al., 2011). In the present study, Cronbach α internal consistency reliability coefficient was 0.92.

Physical activity and healthy eating intentions. A 3-item questionnaire developed by Chatzisarantis and colleagues (1997) was used to measure participants' intentions to engage in physical activity. Participants were asked to respond to items on a 7-point scale, with anchors ranging from 1 (*very unlikely*) to 7 (*very likely*). A sample item for physical activity intentions included "I plan to do physical activity at least three times next week". A similar 3-item questionnaire modified based on Chatzisarantis and colleagues' (1997) and Luszczynska and colleagues (2007) was used to measure participants' intentions to eat a healthy diet. A sample item for healthy eating intentions included "I plan to eat a healthy diet every day next week" with anchors ranging from 1 (*very unlikely*) to 7 (*very likely*). In the present study, ordinal α (Zumbo et al., 2007) internal consistency reliability coefficients for these measures were ≥ 0.94 .

Data Analysis

At the item level, 13.62% of the data were missing. A missing value analysis was conducted using SPSS (Version 20), which indicated that the assumption of Missing Completely at Random (MCAR) was met. Specifically, Little's (1988) chi-square test was non-significant, $\chi^2(951) = 904.13, p > .05$. In the subsequent models, a weighted least-squares mean adjusted approach to model estimation was used, with the data analyzed using the *Mplus* 6 software

program. A mediational analysis based on a multilevel structural equation modelling (MSEM) framework was used to test separate models for both physical activity (Figure 4.1) and diet (Figure 4.2). For both physical activity and dietary behaviour, the entire path model was tested simultaneously to reduce the chances of Type I error, while controlling for the nested nature of the data (i.e., girls within groups) in the analyses.

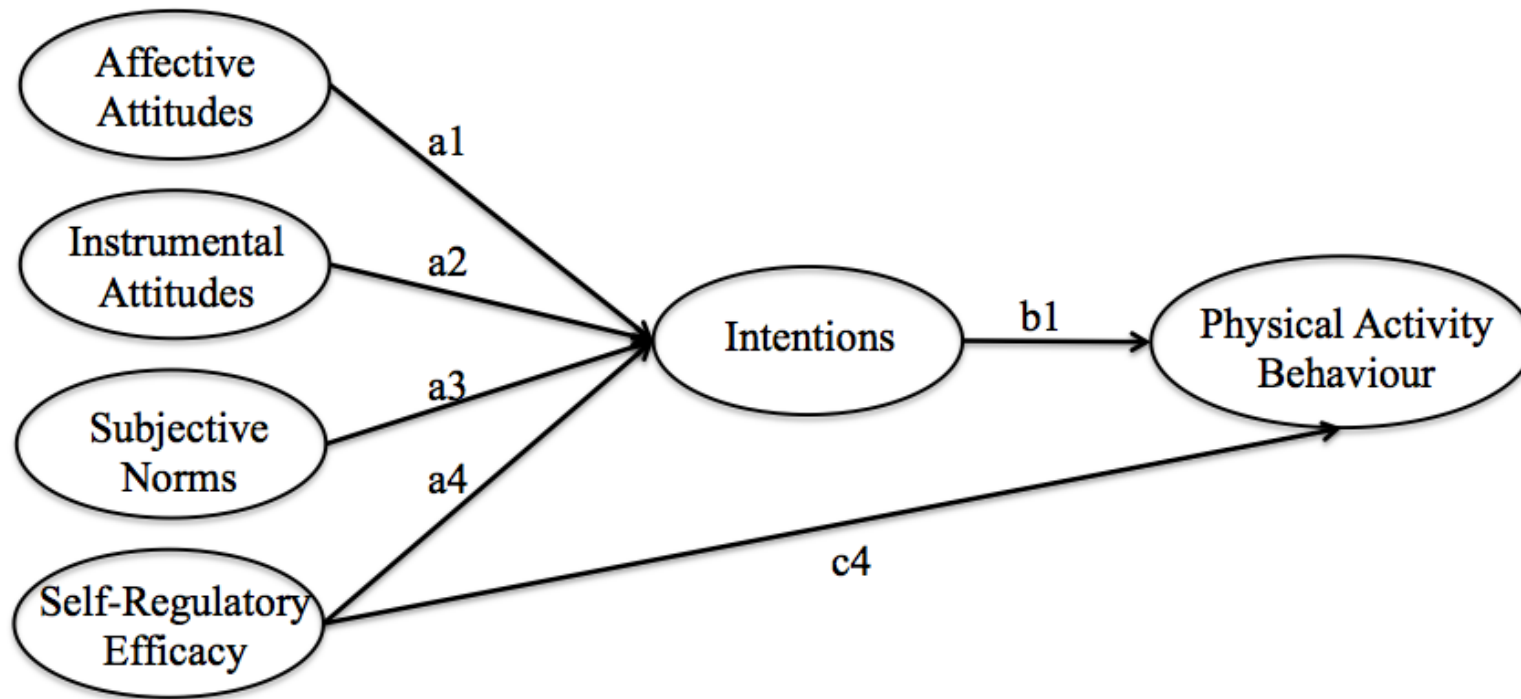


Figure 4.1. Path diagram of the hypothesized relationships between psychological variables (measured at the end of the program) and physical activity behaviour (measured 7 weeks post program completion).

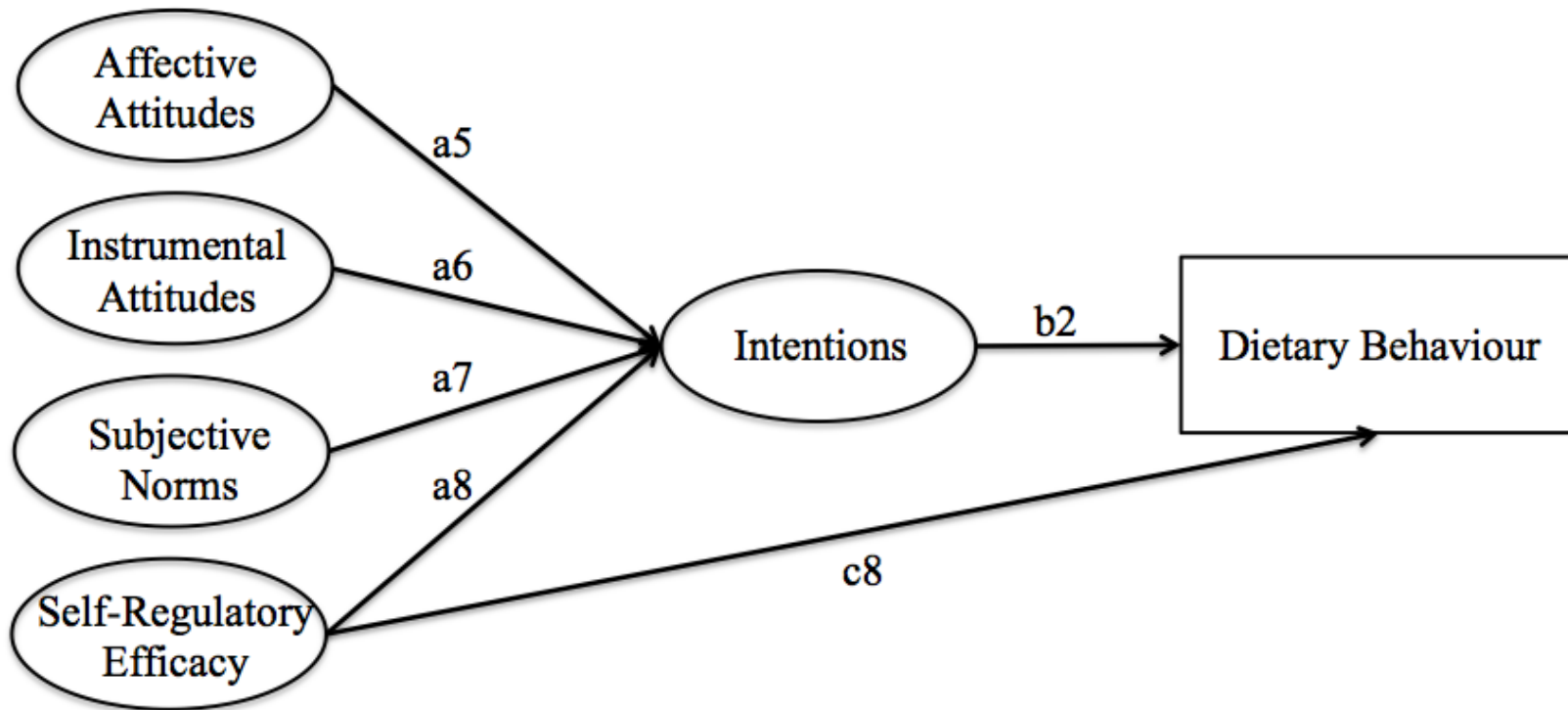


Figure 4.2. Path diagram of the hypothesized relationships between psychological variables (measured at the end of the program) and dietary behaviour (measured 7 weeks post program completion).

Results

Descriptive statistics, including ordinal coefficient alphas are reported in Tables 4.1 and 4.2. Intra-class correlation coefficients (ICCs) indicated that the majority of variance in scores was observed at the individual level (group level ICCs $\leq .10$; see Tables 4.1 and 4.2). However, given the nested nature of the data, multilevel models were run to control for group level effects.

Intervention Manipulation Check

At the end of the program, an assessment of participants' belonging to the *Go Girls!* program was conducted as a manipulation check to ascertain whether a sense of connection to the group was evident. Analysis of the responses to the *Go Girls!* program belonging measure confirmed that on average, the girls felt a sense of belonging to their group ($M = 3.74$, $SD = 0.40$; range 2.0-4.0)¹¹.

Model 1 – Predicting Physical Activity Behaviour

For physical activity, the fit indices for the a priori model were CFI = 0.988, TLI = 0.985, SRMR_{within} = 0.050, RMSEA = 0.074 (see Table 4.3 and Figure 4.3 for results). Path analyses revealed participants' affective attitudes ($b = 0.244$, $p = .001$), instrumental attitudes ($b = 0.211$, $p = .010$) and self-regulatory efficacy for physical activity ($b = 0.504$, $p < 0.001$) predicted physical activity intentions. In addition, affective attitudes ($b = 0.098$, $p = .022$), self-regulatory efficacy ($b = 0.178$, $p = .001$) and intentions for physical activity ($b = 0.299$, $p < .001$) directly predicted physical activity behaviour. Subjective norms did not significantly contribute to the prediction of physical activity intentions ($b = 0.067$, $p = .278$) or behaviour ($b = 0.061$, $p = .235$).

¹¹ *Go Girls!* belonging was not a significant moderator of the relationship between the social cognitions and behaviours targeted in the program. This null finding may be attributable to the low variability in reported sense of belonging (i.e., most girls reported a high sense of belonging).

With regard to indirect effects on physical activity behaviour, the results revealed that intentions mediated the relationships between the social cognitions assessed (i.e., attitudes and self-regulatory efficacy) and physical activity behaviour. Specifically, the indirect effects of affective and instrumental attitudes on physical activity behaviour were partially mediated by intentions, as $a1*b1$ ($b = .073, p = .018$) and $a2*b1$ were significant ($b = .063, p = .007$). The indirect effect of self-regulatory efficacy on physical activity behaviour was also partially mediated by intentions, as $a4*b1$ was significant, ($b = .150, p < .001$). The TPB variables explained 36.5% of the variance ($R^2 = 0.365$) in physical activity behaviour.

Model 2 – Predicting Dietary Behaviour

For dietary behaviour, the fit indices for the a priori model were CFI = 0.988, TLI = 0.984, SRMR_{within} = 0.053, RMSEA = 0.086 (see Table 4.3 and Figure 4.4 for results). Path analyses revealed participants' affective attitudes ($b = 0.209, p = .011$), instrumental attitudes ($b = 0.293, p = .005$) and self-regulatory efficacy for healthy eating ($b = 0.418, p < 0.001$) predicted intentions to engage in healthy eating behaviour. Further, self-regulatory efficacy ($b = 0.383, p = .001$) and intentions for healthy eating ($b = 0.577, p < .001$) directly predicted dietary behaviour. Subjective norms did not significantly contribute to the prediction of dietary intentions ($b = 0.065, p = .156$) or behaviour ($b = -0.110, p = .352$).

With regard to indirect effects on dietary behaviour, the results revealed that intentions mediated the relationships between the social cognitions assessed (i.e., attitudes and self-regulatory efficacy) and dietary behaviour. Specifically, the indirect effect of affective and instrumental attitudes on dietary behaviour was partially mediated by intentions, as $a5*b2$ ($b = .120, p = .043$) and $a6*b2$ were significant ($b = .169, p = .032$). The indirect effect of self-regulatory efficacy on dietary behaviour was also partially mediated by intentions, as $a8*b2$ was

significant, ($b = .241, p = .002$). The TPB variables explained 31.2% of the variance ($R^2 = .312$) in dietary behaviour.

Table 4.1.

Descriptive Statistics, Reliability Coefficients, and Zero-order Correlations for Physical Activity Variables

Variable	<i>M</i>	<i>SD</i>	ICC	Skewness	Kurtosis	Reliability	2	3	4	5	6	7
1. Affective Attitudes (T3)	5.62	1.27	0.02	-0.82	0.50	0.90	0.42**	0.15*	0.44**	0.48**	0.38**	0.20**
2. Instrumental Attitudes (T3)	5.10	1.52	0.08	-0.62	-0.16	0.88		0.27**	0.34**	0.42**	0.23**	0.07
3. Subjective Norms (T3)	4.60	0.97	0.01	-0.58	0.37	0.76			0.15*	0.23**	0.14	0.33**
4. Self-regulatory Efficacy (T3)	55.90	23.89	0.07	-0.11	-0.58	0.91				0.61**	0.46**	0.14*
5. Intentions (T3)	5.47	1.35	0.07	-0.77	-0.05	0.94					0.50**	0.21**
6. Total Physical Activity (T4)	4.47	1.66	0.04	-0.21	-0.72	0.88						0.11
7. <i>Go Girls!</i> Belonging (T3)	3.76	0.37	0.09	-1.80	3.25	0.95						

Note. ICC = intraclass correlation coefficient. Correlations significant at * $p < .05$, ** $p < .01$. Affective and instrumental attitudes measured from 1 - 7, subjective norms measured from 1 – 6, self-regulatory efficacy measured from 0 – 100, intentions measured from 1 - 7, physical activity measured from 1-7 days/week, *Go Girls!* belonging measured from 1 - 4, where higher scores represent more positive cognitions and behaviour. Cronbach alpha reported for self-regulatory efficacy, Spearman-Brown rho reported for physical activity behaviour and ordinal coefficient alpha reported for the other variables.

Table 4.2.

Descriptive Statistics, Reliability Coefficients, and Zero-order Correlations for Dietary Variables

Variable	<i>M</i>	<i>SD</i>	ICC	Skewness	Kurtosis	α	2	3	4	5	6	7
1. Affective												
Attitudes (T3)	5.07	1.55	0.08	-0.54	-0.28	0.92	0.53**	0.15*	0.47**	0.53**	0.30**	0.19*
2. Instrumental												
Attitudes (T3)	5.83	1.38	0.10	-1.27	1.18	0.97		0.14	0.33**	0.43**	0.26**	0.08
3. Subjective												
Norms (T3)	4.55	1.044	0.01	-0.47	-0.38	0.71			0.20**	0.24**	0.11	0.24**
4. Self-regulatory												
Efficacy (T3)	65.80	24.20	0.03	-0.55	-0.39	0.92				0.58**	0.46**	0.24**
5. Intentions (T3)	5.09	1.35	0.10	-0.40	-0.44	0.94					0.53**	0.18*
6. Dietary												
Behaviour (T4)	11.59	3.54	0.08	-0.81	0.32	0.80						0.05
7. <i>Go Girls!</i>												
Belonging (T3)	3.76	0.37	0.09	-1.80	3.25	0.95						

Note. ICC = intraclass correlation coefficient. Correlations significant at * $p < .05$, ** $p < .01$. Affective and instrumental attitudes measured from 1 - 7, subjective norms measured from 1 - 6, self-regulatory efficacy measured from 0 - 100, intentions measured from 1 - 7, dietary behaviour scores range from 1-17, *Go Girls!* belonging measured from 1 - 4, where higher scores represent more positive cognitions or behaviour. Cronbach alpha reported for self-regulatory efficacy and dietary behaviour and ordinal coefficient alpha reported for the other variables.

Table 4.3.

Multilevel Structural Equation Modelling Mediation Analysis of Effects of Psychological Variables on Girls' Behaviour

Variables	Estimate	SE	p	95% CI
Model 1 (Physical Activity)				
(Outcome: Intentions)				
Predictor: Affective Attitudes (a1)	0.244	0.071	.001	[0.105, 0.383]
Predictor: Instrumental Attitudes (a2)	0.211	0.082	.010	[0.050, 0.372]
Predictor: Subjective Norms (a3)	0.067	0.062	.278	[-0.055, 0.189]
Predictor: SRE (a4)	0.504	0.075	.000	[0.357, 0.651]
(Outcome: Physical Activity Behaviour)				
Mediator: Intentions (b1)	0.299	0.074	.000	[0.154, 0.444]
Predictor: Affective Attitudes (c1)	0.098	0.043	.022	[0.014, 0.182]
Predictor: Instrumental Attitudes (c2)	0.138	0.076	.071	[-0.011, 0.287]
Predictor: Subjective Norms (c3)	0.061	0.051	.235	[-0.039, 0.161]
Predictor: SRE (c4)	0.178	0.055	.001	[0.070, 0.286]
<i>Indirect Effects</i>				
a1 * b1	0.063	0.024	.007	[0.016, 0.110]
a2 * b1	0.073	0.031	.018	[0.012, 0.134]
a3 * b1	0.020	0.019	.304	[-0.017, 0.057]
a4 * b1	0.150	0.036	.000	[0.079, 0.221]
R^2	0.365	0.043	.000	

Table 4.3. continued

Variables	Estimate	SE	p	95% CI
Model 2 (Diet)				
(Outcome: Intentions)				
Predictor: Affective Attitudes (a5)	0.232	0.054	.000	[0.126, 0.338]
Predictor: Instrumental Attitudes (a6)	0.144	0.050	.004	[0.046, 0.242]
Predictor: Subjective Norms (a7)	0.065	0.046	.156	[-0.025, 0.155]
Predictor: SRE (a8)	0.507	0.040	.000	[0.429, 0.585]
(Outcome: Dietary Behaviour)				
Mediator: Intentions (b2)	0.577	0.155	.000	[0.273, 0.881]
Predictor: Affective attitudes (c5)	0.044	0.172	.797	[-0.293, 0.381]
Predictor: Instrumental attitudes (c6)	-0.059	0.182	.746	[-0.416, 0.298]
Predictor: Subjective norms (c7)	-0.110	0.118	.352	[-0.341, 0.121]
Predictor: SRE (c8)	0.383	0.116	.001	[0.156, 0.610]
<i>Indirect Effects</i>				
a5 * b2	0.169	0.079	.032	[0.014, 0.324]
a6 * b2	0.120	0.060	.043	[0.002, 0.238]
a7 * b2	0.073	0.040	.064	[-0.005, 0.151]
a8 * b2	0.241	0.076	.002	[0.092, 0.390]
R^2	0.312	0.051	.000	

Note. SRE stands for self-regulatory efficacy. Unstandardized path coefficients are reported.

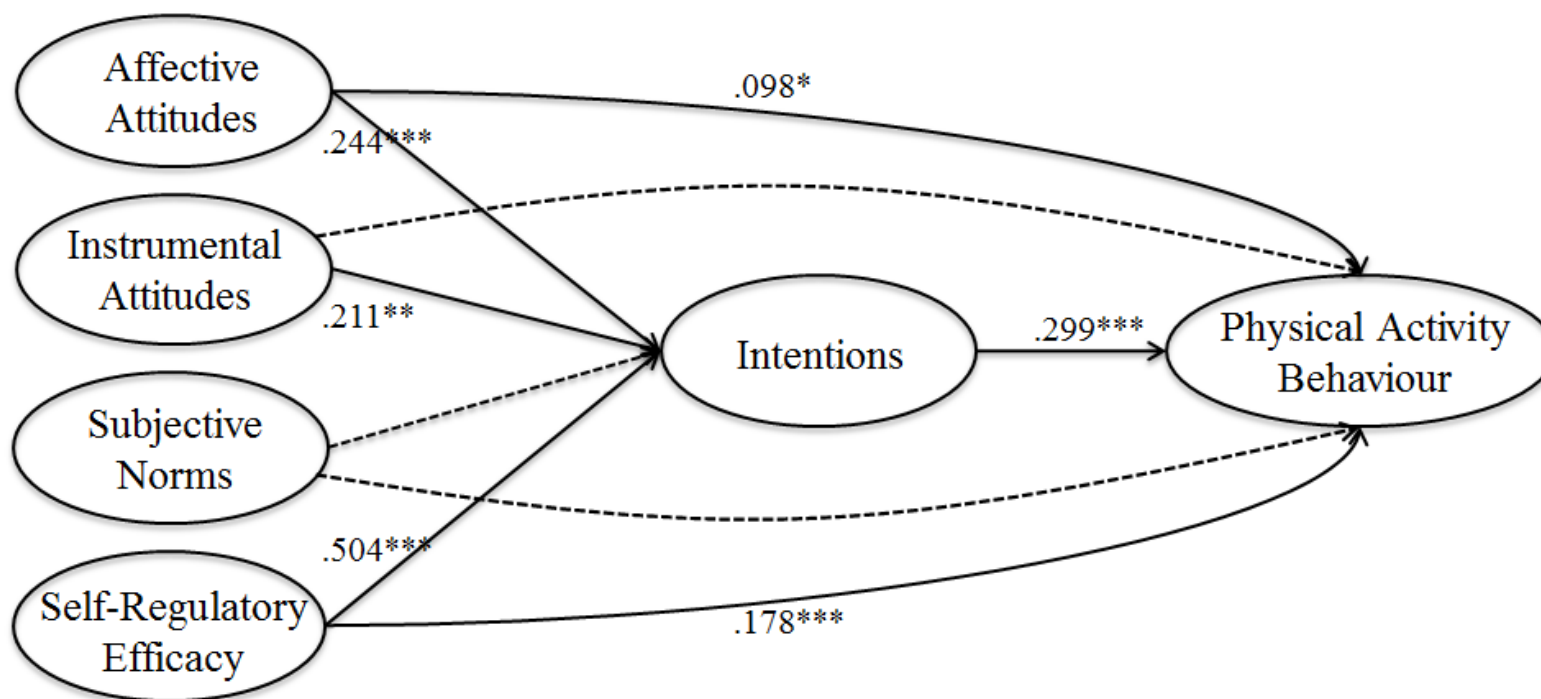


Figure 4.3. Path diagram of the relationships between psychological variables (measured at the end of the program) and physical activity behaviour (measured 7 weeks post program completion). The dashed line represents non-significant paths. Unstandardized path coefficients are reported.

* $p < .05$, ** $p < .01$, *** $p < .001$.

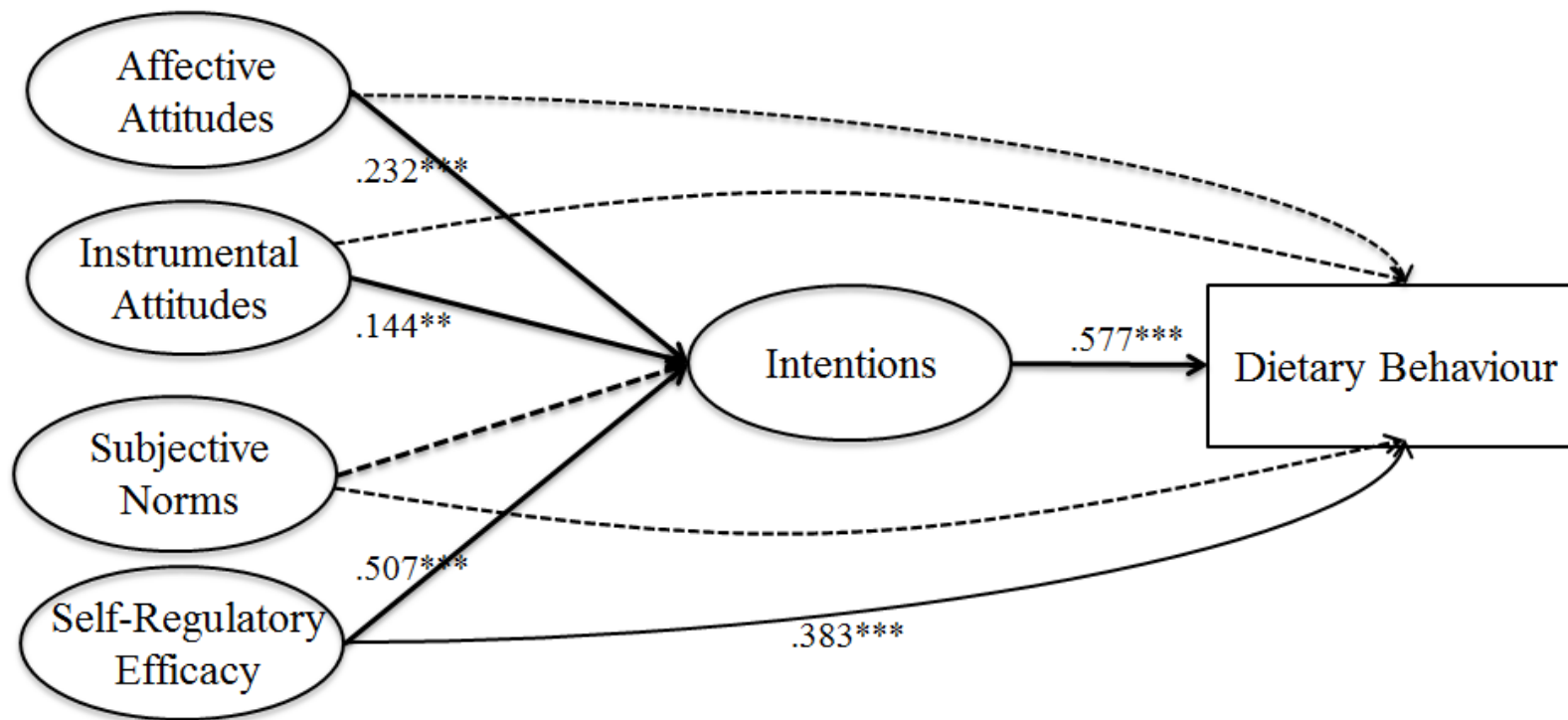


Figure 4.4. Path diagram of the relationships between psychological variables (measured at the end of the program) and dietary behaviour (measured 7 weeks post program completion). The dashed line represents non-significant paths. Unstandardized path coefficients are reported.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

Adolescent girls are at risk of poor health outcomes because of low levels of health-enhancing behaviours (e.g., physical activity and healthy eating behaviours; Colley et al., 2011b; Riediger et al., 2007). It has been suggested that interventions that foster a sense of connections among girls while also instilling a change in attitudes, norms and beliefs, may be particularly effective as a means of addressing these health behaviour concerns in this population (Gilligan, 1982; Goodenow, 1993; J. E. Rhodes, 2005; J. E. Rhodes & DuBois, 2008). One intervention format that can be used to target belonging is through mentor-based programs. In this study we examined the psychosocial predictors of physical activity and dietary behaviour among adolescent girls involved in a group-based mentoring program that aimed to foster a sense of belonging to the program. As confirmed by the manipulation check, at the end of the program, participants reported an elevated sense of belonging to their group. Furthermore, consistent with the TPB, participants' attitudes, self-regulatory efficacy and intentions at the end of the program contributed to the prediction of both physical activity and healthy eating behaviour (separately) at 7 week follow-up. From a public health perspective, it is noteworthy that participants' cognitions at the end of the program predicted behaviours 7 weeks post program completion.

Consistent with the TPB and previous research (Ajzen, 1991; Araujo-Soares et al., 2009; Luszczynska et al., 2004), at the end of this program, when adolescent girls reported greater enjoyment (i.e., affective attitudes) of physical activity and healthy eating, and confidence in their capabilities to engage in these behaviours, this predicted their behavioural intentions at the end of the program and prospectively predicted actual behaviours 7 weeks later. The findings highlight the importance of targeting these social cognitions in health promotion programs. Interestingly, in addition to affective attitudes, instrumental attitudes had indirect effects

(through behavioural intentions) on participants' physical activity and dietary behaviour. While findings from a recent meta-analysis (Nasuti & Rhodes, 2013) suggest that affective attitudes are most important in predicting behaviour, our findings suggest that adolescent girls *also* need to understand *why* (i.e., instrumental attitudes) engaging in physical activity is important.

Although contrary to our original hypothesis, the finding that subjective norms did not significantly contribute to the prediction of intentions or behaviour is consistent with some previous research that has utilized the TPB in the prediction of a range of behaviours (e.g., for a review see Armitage & Conner, 2001). While positive normative beliefs of adolescent girls' peers are unlikely to hinder engagement in healthy behaviours, the findings from the current study suggest that participants' perceptions of their *group members' beliefs* about them engaging in the behaviour did not significantly contribute to the prediction of behaviours after the program had ended (i.e., measured at 7 week follow-up in this study). Although recommendations to improve assessment of subjective norms were followed in this study (i.e., use of a multi-item validated measure and assessment of injunctive norms; Armitage & Conner, 2001; Cialdini et al., 1990), it is possible that subjective norms pertaining to the *Go Girls!* group members did not exert a salient effect on girls' behaviours after the program had ended and the group disbanded. Alternatively, drawing from findings by Hamilton and White (2008), it is possible that normative beliefs tied to peers/friends *outside* of the *Go Girls!* program might be more salient determinants of adolescents' intentions to engage in health behaviour(s) than those normative beliefs associated with *Go Girls!* participants. Indeed, subjective norms associated with other *Go Girls!* participants might be less influential than norms associated with peers (outside of the program) with whom who they likely spend considerably more time with (especially during leisure time hours). Assessment of the subjective norms of program participants along with the subjective

norms of other *important others* (e.g., day-to-day friendship interactions, family members) represents an important consideration within any future research.

Although subjective norms did not significantly contribute to the prediction of intentions or behaviour in the current study (which was possibly due to use of a less salient referent group), the social environment created within the *Go Girls!* groups appeared to be an important contextual factor that contributed to the effectiveness of the program. Specifically, findings from the manipulation check revealed that participants also reported a high sense of belonging to their *Go Girls!* groups. Indeed, the program was designed to develop positive and supportive relationships between the girls and mentors, which likely fostered the participants' sense of belonging to the program that targets health-enhancing cognitions (Baumeister & Leary, 1995; J. E. Rhodes, 2005). These findings are in line with group-mediated cognitive-behavioural interventions (Brawley et al., 2000), which create a cohesive group environment and use group processes to foster health-enhancing cognitions. Drawing from the group dynamics and mentoring literature and the findings from the current study, it appears that targeting social cognitions (i.e., self-regulatory efficacy, attitudes and intentions) in a safe, supportive and connected environment is an important focus for health promotion programs designed to help adolescent girls.

In spite of the potential contributions of this study, limitations should also be acknowledged. Data were not collected from a control group and thus we were unable to make *causal conclusions* regarding the prospective prediction of physical activity and dietary behaviours from the social cognitions assessed in this study. Future research utilizing a randomized controlled design where participants are allocated to the program or a wait-list control (or other comparison group) could specifically test this important research question. In

addition, in this study we did not examine the extent to which implementation fidelity (i.e., whether the program was implemented as intended) or program dose (i.e., the amount of time the program was delivered for) moderated the relationship between the TPB derived cognitions and behaviour. As recommended by J. E. Rhodes (2008), examination of both program implementation fidelity and dose represent important areas of research when conducting program evaluation.

Notwithstanding these limitations, the results of the current study are noteworthy for a number of reasons. First, we collected data from a large sample and the findings are generalizable to similar populations across Canada (i.e., adolescent girls in this program delivered in urban communities). Second, the use of multilevel structural equation modelling represents a considerable strength of the study, as we were able to control for any group level effects on the relationships we examined. Third, the study provided a test of theory in a real world setting and provided evidence for the ecological validity of the findings (Brewer, 2000). Finally, consistent with R. E. Rhodes' (2014) recommendations to examine the program context in relation to the target population, the findings from our study highlight an important component (i.e., fostering a sense of belonging to the group) of health promotion programs for this population (i.e., adolescent girls). In conclusion, the findings from this study are consistent with previous theory and research and demonstrate that attitudes, self-regulatory efficacy and behavioural intentions are important determinants of both physical activity and dietary behaviour among adolescent girls.

Chapter 5: Adolescent Girls' Experiences in the *Go Girls!* Group-Based Lifestyle Mentoring Program: Findings From A Qualitative Program Evaluation

Introduction

Adolescents who engage in healthy dietary and physical activity behaviour have increased protection from cardiovascular disease, Type II diabetes, as well as psychological ailments (Janssen & Leblanc, 2010). Across the lifespan, adolescence is a formative time for developing healthy behaviours that transfer into adulthood (Kleinert, 2007). Unfortunately, low levels of physical activity and poor dietary behaviours among adolescents are widely reported (e.g., Bruening et al., 2012; Colley et al., 2011b; Ogden, Kit, Carroll, & Park, 2011). In particular, adolescent girls do not meet established health behaviour guidelines at a disparate rate when compared to their male counterparts. For example, adolescent girls, on average, consume approximately 1.56 energy dense sweet foods per day whereas boys only consume approximately 1.35 per day (Pearson, Salmon, Campbell, Crawford, & Timperio, 2011). In terms of physical activity, 21.5% of boys and 11.3% of girls engage in moderate-vigorous physical activity for a least 60 minutes on at least 5 days of the week (Colley et al., 2011b). As a result, programs designed to improve health behaviours, such as physical activity and healthy eating, among adolescent girls represents a particularly important focus for health promotion.

A range of programs designed to help adolescent girls improve health-enhancing cognitions and behaviours have been implemented with varying degrees of success (e.g., Waters et al., 2011; Wilfley et al., 2007). From a health promotion standpoint, it is important for successful programs (i.e., behaviour change strategies) to be translated into practice rapidly; however, it is also important to identify and reconsider program strategies that are not successful.

Thus, evaluation of the translation of strategies and techniques into practice is an essential component of health promotion research. Among many purposes, program evaluation can provide important information on the representativeness and reach, efficacy and/or effectiveness, sustainability and feasibility of interventions (Glasgow et al., 1999). This information is essential for health promotion for three reasons: (a) it helps practitioners improve the program(s), which in theory, improves health outcomes among the targeted population(s) (Glasgow et al., 2013); (b) it allows researchers to test, refine and in some cases, develop new theories and strategies for health behaviour change (Anesetti-Rothermel, Noerachmanto, Horn, & Dino, 2012; Glasgow et al., 2013; Plotnikoff, Lubans, Penfold, & Courneya, 2013); and (c) it directs policymakers to support successful (i.e., representative, effective/efficacious, sustainable and feasible) programs, thereby improving public health outcomes (Brownson, Chiqui, & Stamatakis, 2009). Given the high prevalence of unhealthy behaviours specifically among adolescent girls, evaluation of evidence-based lifestyle programs for young females represents an important area of inquiry.

From a translational behavioural medicine perspective, dissemination of the fundamental components of effective programs is particularly important as such information increases the chances that such programs will be implemented in the intended practice setting (Downey, Wages, Jackson, & Estabrooks, 2012). For example, in the case of adolescent girls, evidence suggests that the social context may be a particularly important factor contributing to the success of the program (e.g., Hirsch et al., 2000; Loder & Hirsch, 2003). Indeed, the development of social connections (i.e., friendships and/or mentoring relationships) has been highlighted as a key component in overcoming the unique challenges faced by adolescent girls (Gilligan, 1982; Goodenow, 1993; Ma & Huebner, 2008). With the aim of developing such connections, lifestyle

programs often have adopted mentorship models in which a mentor is paired with a girl or group of girls (J. E. Rhodes, 2005, 2008; J. E. Rhodes, Lowe, Litchfield, & Walsh-Samp, 2008).

Despite the widespread implementation of mentoring programs for youth, meta-analytic evidence suggests these types of programs generally have small to modest effects on targeted outcomes such as reducing alcohol and drug use and improving academic performance (DuBois, Holloway, Valentine, & Cooper, 2002; Eby, Allen, Evans, Ng, & DuBois, 2008). Although the majority of mentoring programs have typically focused on reducing *health-compromising* behaviours (e.g., alcohol and drug use) as well as academic achievement, some mentoring programs have targeted *health-enhancing* behaviours, including physical activity and diet. Among those studies that have provided evidence for the effectiveness of mentoring programs to result in changes in cognitions (e.g., physical activity self-efficacy and self-reported psychological “stage of change” for both dietary and physical activity behaviours), studies have yet to demonstrate changes in health-enhancing behaviour (e.g., physical activity or diet; Neumark-Sztainer et al., 2010; Story et al., 2003). In mentorship programs, the role of the mentor is to facilitate the sessions, develop supportive relationships with the girl(s), and model healthy lifestyle behaviours for the girls (E. M. Anderson & Shannon, 1988). Indeed, the mentor has a very important role in the creation of an environment conducive to learning (Bandura, 1977) and fostering connections with and among the girls.

In addition to the potential role of program mentors, the group environment may be particularly beneficial for influencing adolescent behaviours because the girls can learn from one another through social learning and subsequent mastery experiences (Bandura, 1977, 1986; Brawley et al., 2000) and develop connections with one another. In particular, through development of these connections, the girls’ need to belong can be fulfilled (Baumeister &

Leary, 1995). Research suggests that class- or school-based belonging as well as teacher support are positively related to improvements in motivation and academic performance among adolescent girls (Furrer & Skinner, 2003; Goodenow, 1993; Phan, 2013). With this in mind, the overall goal of this study was to examine adolescent girls' experiences of being in a group-based lifestyle mentorship program. Specifically, the purpose of the current study was to use a social constructivist approach (cf. Schwandt, 2000) to examine the participants' interpretation of their experiences in the program. A social constructivist perspective was used because this framework suggests that an individual's learning is facilitated through interactions in a social context (Schwandt, 2000). Indeed, in the current study we were interested in the *learning experiences* of the participants who engaged in the group-based mentoring lifestyle program in question. By using a social constructivist approach we sought to understand (a) the participants' overall experiences in the program, (b) the relationships participants developed in the program (with regard to their mentors and other group members), (c) changes (cognitive and/or behavioural) arising from participating in the program, (d) components of the program that participants liked, and (e) components that the participants thought should be improved.

Method

Participants

Institutional review board and school board approval were obtained before we commenced data collection. The program examined in the current study is run by member agencies of Big Brothers Big Sisters (BBBS) of Canada and is entitled *Go Girls! Healthy Minds Healthy Bodies*, or *Go Girls!* for short. The data collected for this study consisted of semi-structured, one-on-one, interviews conducted with a purposively sampled selection of 12 *Go Girls!* program participants ($M \pm SD$ age 11.66 ± 1.22 years). Specifically, girls were asked to

participate in this study if the mentors and agency staff perceived the girls to be open to sharing their experiences in the *Go Girls!* program. Procedures used by Statistics Canada in the 2006 Census were followed as participants were asked to identify all ethnic/cultural groups with which they self-identified (i.e., girls could identify with more than one ethnic group). The largest represented ethnic groups were White (58.3%), Aboriginal (16.7%), and Black (16.7%).

The *Go Girls!* Healthy Bodies, Healthy Minds Program

The *Go Girls!* program is a 7 week program that consists of 2-hour weekly sessions (14 hours total), with each session run by two female volunteers (i.e., the mentors). Mentors are recruited and screened by BBBS agencies and trained by agency staff (Big Brothers Big Sisters of Canada, 2006). Mentors are women (aged 18-25) who have an interest in physical activity, healthy eating and mentoring. Girls meet with the *Go Girls!* mentor and 4 to 15 ($M_{group\ size} = 8.54$, $SD = 3.11$) other girls in a classroom provided by their respective schools, and this occurs after school hours. The sessions were designed using social cognitive theories of behaviour change (e.g., Ajzen, 1991; Bandura, 1977, 1986, 1997; Rosenstock et al., 1988) to provide experiential (social learning) experiences to help girls adopt and maintain healthy lifestyles.

More specifically, the purpose of the sessions is to teach girls about living a healthy lifestyle in terms of being physically active, healthy eating practices, and to help them feel better about themselves (i.e., improve body image). These outcomes are targeted through activities that have been found to foster social learning (Bandura, 1977) and key social cognitions (i.e., self-efficacy, instrumental and affective attitudes, social belonging) and behaviours (i.e., physical activity and healthy eating). To target physical activity, during each session the girls participate in an active activity (e.g., play tag or learn how to skip double dutch) to help them learn that (a) they *can* be physically active (i.e., self-efficacy is targeted by the girls learning from each other

and having mastery experiences trying new activities), (b) physical activity is *good for them* (i.e., instrumental attitudes are targeted through information provided to the girls) and (c) they can *enjoy* being physically active (i.e., affective attitudes targeted through playing enjoyable games with the group). To target healthy eating, every week the mentors bring healthy snacks for the girls and teach them (a) that they *can* eat a healthy diet (i.e., self-efficacy), (b) *how* and *why* to eat a healthy diet (i.e., instrumental attitudes) and (c) that eating healthfully can be *enjoyable* (i.e., affective attitudes). Other activities are specifically designed to enhance how the girls feel about themselves such as games involving giving each other compliments and learning to problem solve. Through these group-based activities, the girls learn more about each other, learn to work together and develop connections with one another (i.e., fostering a sense of social belonging).

Procedures

Three trained research assistants, all with previous experience in conducting interviews and working with youth, conducted the interviews. The research assistants explained to the participants that the purpose of the interview was to understand participants' experiences with the *Go Girls!* program. Each interviewer was provided with a semi-structured interview guide that included questions to prompt the participants to discuss their experiences. Specifically, the interview guide covered the following topics (a) the participants' overall experiences in the *Go Girls!* program, (b) the relationships participants developed in the program, (c) changes (cognitive and/or behavioural) from participating in the program, (d) components of the program that participants liked and (e) components that the participants thought should be improved. The interview guide is available from the first author upon request. Participants provided assent and their parent/guardian provided written informed consent before completing the interview. The

interviewers developed rapport with the participants through informal conversations before the interview began. The interviews were audio-recorded and conducted at the participants' respective schools, which was also the location for the *Go Girls!* program sessions. Research assistants transcribed the interviews verbatim shortly after they were conducted (Burnard, 1991). The participants were informed that they could choose to have their audio file deleted after the interview was completed if they did not want their data included in the study.

Data Analysis

In the first part of data analysis, the first two authors identified meaning units (i.e., words that reflect the same core thought; Baxter, 1991) within the transcripts. The next step involved a conventional inductive content analysis (Maykut & Morehouse, 1994) in which general emergent patterns and themes were identified from the dataset. Specifically, the first author initially identified salient themes regarding the key research questions: (a) the participants' overall experiences in the *Go Girls!* program, (b) the relationships participants developed in the program, (c) changes (cognitive and/or behavioural) from participating in the program, (d) components of the program the participants liked and (e) components that the participants thought should be improved. The first two authors independently coded the first participant's interview and met to resolve discrepancies. The first two authors then independently coded two more interviews and met to resolve discrepancies and refine the extraction guide (Patton, 2002). High inter-rater reliability was established (87%) after coding these additional transcripts (216 meaning units). Once themes and patterns were identified, an iterative cycle using a combination of inductive (i.e., new themes were still allowed to emerge) and deductive analysis was applied to the remaining 375 meaning units (Strauss, 1987). Inter-rater reliability was determined to be 89% across all 649 meaning units. After coding all 649 meaning units, the third author worked

with the first two authors as a coding team to (where appropriate) revisit the themes and categories for clarity and parsimony.

To maximize rigour regarding the trustworthiness of the data collection and analysis procedures, three verification strategies were used throughout the research process (Morse, Barrett, Mayan, Olson, & Spiers, 2002). These included (a) use of purposive sampling of girls who participated in the *Go Girls!* program, (b) maintaining an audit trail of decisions regarding the coding and analysis, and (c) using multiple analysts who reviewed and discussed the coding, as well as conceptual similarities and differences between the themes. Analyst triangulation served as a credibility check to ensure the themes correctly represented the participants' responses, and all the authors reviewed the themes and acted as "critical friends" to suggest alternative interpretations of the data to minimize researcher bias (Holt & Sparkes, 2001).

Results

In total, the 12 interviews produced 78 pages of single-spaced transcribed text. Two higher order themes emerged from the data (general components of the program and program outcomes), with seven lower order themes nested within the two higher-order themes (see Figure 5.1) that reflected the participants' experiences in the *Go Girls!* program. Table 5.1 illustrates the seven lower-order themes and the 27 categories that aligned with the higher-order themes. As displayed in Figure 5.1, the first higher-order theme that emerged from the data was *general components of the program*, which included participants' *initial perceptions of the program*, *elements of the program*, *activities during the program*, *cognitions about the mentor*, and *suggested program adaptations*. The second higher-order theme that emerged from the data involved *program outcomes* from participating in the program including *development of social*

connections and *reported changes* in cognitions and behaviours resulting from participating in the program. Each of the themes is summarized in the table below.

Table 5.1.

Qualitative Results for Participant Interviews from the Go Girls! Program Evaluation During the 2012-2013 School Year

	Category Name	P (n)	MU (n)	Example MU
Previous & Initial Perceptions	Previous cognitions and behaviours	10	20	"Honestly, before when I would look in the mirror I would see so many things wrong based on like, the image society has put out in the world on how girls should look."
	Initial discomfort	6	11	"...when we first got to <i>Go Girls!</i> , we were sort of uncomfortable like, 'What am I gonna do?'"
	General expectations	3	9	"...and a lot of other friends in other grades did it [the <i>Go Girls!</i> program] too and they told me it was fun."
Elements of the Program	Overall positive perception	12	65	"I think <i>Go Girls!</i> was like an amazing experience."
	Processes	10	61	"It was like hands on, instead of just sitting down and taking notes it was more hands on and that what I kind of liked about it."
	Healthy living awareness	7	18	"Like just to eat more healthy and how it helps with your body."
	Weekly snacks	6	13	"I liked the snacks because we had fruit, we had vegetables."
Activities	Enjoyment of activities	11	48	"It was really fun, you had to hurry and say their name so it was really fun."
	Description of activities	10	23	"We had to spin a little spinner and the colour it landed on, it was in the book so then someone would ask us a question and then we'd answer it."
	Lessons learned	3	8	"If you just look at it and just say 'Okay, that's a game,' you wouldn't really get what it's supposed to do; but if you think about it and how that relates to that, and that relates to that, you will get it."
Mentor	Positive personal characteristics	10	37	"She was fun!"
	Created positive environment	3	10	"...so every now and then we would pick three people to read from our <i>Go Girls!</i> journal, the, the tip of the day and we also did some creative stuff and she made sure that everybody was participating."
	Roles as leader	3	6	"[what helped you?]...because she talked us through it and I talked to her about how I don't think I'm skinny and she told me that it doesn't matter and it doesn't matter your shape, and it only matters your personality and how nice you are."

Table 5.1. Continued				
	Category Name	P (n)	MU (n)	Example MU
Suggested Program Adaptations	Longer program	6	10	"If it [the program] could be a little longer [more sessions]."
	Keep the same	5	8	"I don't think anything should be changed."
	Activity suggestions	4	22	"Well because of the timing, we were sort of in winter. I would like to go outside."
	Change groups	3	8	"Well maybe they could add another grade."
	Increase group size	3	4	"Probably to have more people join because I would wanna meet more people and be more friends, have more friends with people I never really knew before."
Development of Social Connections	Friendships	12	52	"Well I definitely gained friendships [from <i>Go Girls!</i>]."
	Belonging/bonding	11	46	"...because you get closer to the other people."
	Shared lessons learned with others	9	23	"I've shared with them like the healthy facts, like how to eat properly."
	Felt like family	5	11	"What I liked about the <i>Go Girls!</i> is that we felt like a family."
Reported Changes	Psychosocial	11	66	"Well now that I've been through the <i>Go Girls!</i> program I kind of feel more open."
	General	9	18	"Yeah, I'd say I would. I could use it [what I learned in <i>Go Girls!</i>] in my afternoon class."
	Behavioural	7	32	[after <i>Go Girls!</i>] "...I have been trying my best to run a little during recess and during all my free time too."
	Relationships Outside of <i>Go Girls!</i>	5	12	"I might see that, like I said before, that I can't really don't want to be in the same room as him [her brother], so maybe I can see a bright side if I'm nice to him, even if he's not [nice to me]."
	Minimal/no changes	4	6	"But not much changed though, to tell you the truth."

Note. P = number of participants who spoke about the category. MU = number of meaning units that pertained to that category.

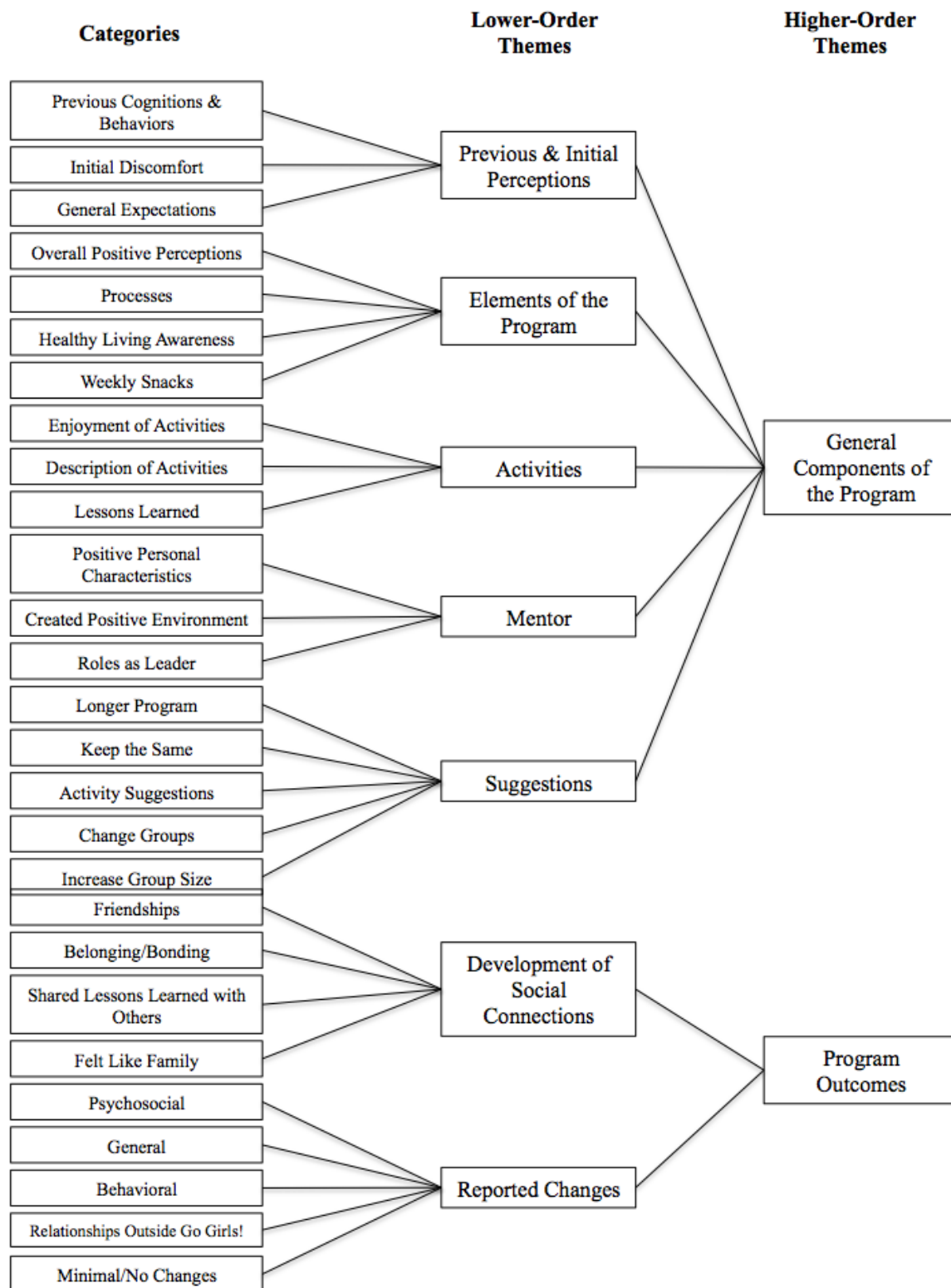


Figure 5.1. Relationship among emergent categories, lower and higher order themes.

General Components of the Program ($n = 381$ meaning units)

Previous and initial perceptions ($n = 40$). The majority of the girls (83%) provided examples of their cognitions and behaviours before the program which typically related to negative attitudes towards physical activity (e.g., “I didn’t really like skipping rope [before *Go Girls!*]”, negative attitudes towards themselves (e.g., [after participating in *Go Girls!*]...I feel better because before I felt like I wasn’t skinny and I felt like I was a little overweight”), as well as negative attitudes towards others (e.g., “like I was kind of really mean [before *Go Girls!*]”). Half of the girls reported feelings of initial discomfort before starting and during the first week of the *Go Girls!* program, and one girl reported that at the start of the program “it made me a little uncomfortable being in the same room as them [the other *Go Girls!* participants]”. A few girls ($n = 3$) reported general positive expectations for participating in the *Go Girls!* program, with one girl specifically noting that her friends “just said it was really fun and you need to do it”.

Elements of the program ($n = 157$). All of the girls reported overall positive perceptions of the program, with numerous positive comments including “just that it’s an amazing program”, “I had a lot of fun” and “we did cool things.” Most of the girls ($n = 10$) also discussed the specific processes of the program such as “Yeah, they [*Go Girls!*] always had you up and moving” and “we put a question into the box and then the next week they gave us just advice if it was like something sad [that] happened to you.” The majority of the girls ($n = 7$) reported learning about healthy living “like say that I’m supposed to eat a moderation, not too much of each food group...” and “so we would do different activities to learn different ways on how to keep a healthy lifestyle.” All of the girls who discussed the weekly snacks ($n = 6$) indicated these were an enjoyable component of the program commenting, “I really liked the snacks they brought in.”

Activities ($n = 79$). All of the girls who talked about the activities in *Go Girls!* reported the activities were enjoyable ($n = 11$), with the girls describing the games as “every activity was really fun” and “one of the activities that I enjoyed the most... it’s kind of like telephone...and then like it was just a really fun activity.” While talking about the activities in the program, many of the girls ($n = 10$) described the activities they engaged in (e.g., “so STAR [one of the activities in *Go Girls!*] tell you stop, make sure you’re doing the right thing, think about how it’s going to affect you, and do it, then go over if you think that you could approach it in a different way”). A few of the girls ($n = 3$) also mentioned the lessons they learned from the activity such as “I could see the signal [of an eating disorder] that, like if the person runs in the bathroom as soon as they’ve finished eating.”

Mentor ($n = 53$). All of the girls who talked about their mentor ($n = 10$) reported their mentors’ positive personal characteristics such as “they [the mentors] care about you, they care about you a lot”, “she always encouraged us to do stuff” and “they [the mentors] were just really really fun.” A few of the girls ($n = 3$) also enjoyed the positive environment the mentors created “I felt safe talking to them [the mentors]” and noted their leader’s roles, such as an advisor “...you could ask them [the mentors] things and they would give you a serious answer.”

Suggested program adaptations ($n = 52$ meaning units). All of the girls who mentioned the duration of the program ($n = 6$) also suggested to increase the number of sessions within the program (e.g., “yeah, like having more sessions”). Five girls noted that they did not think the program should be changed at all, “so I don’t think that they need to improve or change anything.” Four girls provided specific activity suggestions for adapting the program including “we should like, make a dance and then show the school if it was okay with the principal.” A few of the girls ($n = 3$) wanted to change the groups by including more grades (age groups), “well

maybe they could add another grade.” Finally, three girls suggested increasing the size of the groups “probably to have more people join because I would wanna meet more people and be more friends, have more friends with people I never really knew before.”

Program Outcomes ($n = 262$ meaning units)

Development of social connections ($n = 132$). All of the girls commented on the friendships developed during the *Go Girls!* program, “now it’s like a really good friendship [with the other *Go Girls!* participants]” and “I also made a stronger relationship with my peers [during *Go Girls!*]”. The majority of the girls ($n = 11$) discussed a sense of belonging during the *Go Girls!* program, “even though we all started off different, we sort of came together, and sort of [unclear] a bond that, that we could keep for a lifetime.” Many of the girls ($n = 9$) also reported that they had shared lessons learned in *Go Girls!* with others such as their mother, “of course after every session, my Mom, I would come home and my Mom would ask me ‘oh what did you do in *Go Girls!* today’ and so I would tell her about everything”. Five of the girls specifically reported that they felt like family with the other girls “by at least from the first, uhh day, we all became actual like sisters you could say”, and with the mentors, “but as things went on they became more like older sisters than mentors.”

Reported changes ($n = 130$). The girls also discussed psychosocial, general, behavioural and relationship changes resulting from the *Go Girls!* program. For example, for the psychosocial changes several examples provided include, “I feel a little more confident about myself”, and “I think a lot more positively.” General comments regarding changes after the *Go Girls!* program such as “Yeah, it [*Go Girls!*] changed a lot about me.” In terms of behavioural changes, many of the girls reported eating a healthier diet “I’m trying to avoid like junk food [since the program]”, and engaging in more physical activity “so I used to just like hang in the

shade with my friends, but now I kind of skip or play basketball or play with my other friends.” Four of the girls reported no or minimal changes resulting from the *Go Girls!* program such as “but not much changed though, to tell you the truth”, however interestingly in some instances such comments were followed up with examples of how she had changed after the program (as discussed above).

Discussion

Drawing from a social constructivist approach, the purpose of this study was to gain an understanding of the participants’ interpretation of their own experiences in the *Go Girls!* program. Overall, the participants reported positive perceptions of and experiences in the program, enjoyment of the program content, development of meaningful relationships with the mentors and with the other participants, improvements in their feelings and cognitions (e.g., confidence, openness, happiness) and increases in healthy behaviours (e.g., physical activity and healthy eating) as a result of completing the program. The participants also provided suggestions as to how the program could be improved. From a public health perspective, it is noteworthy that adolescent girls reported *liking* their experience in the program and *improvements* in important health-enhancing cognitions and behaviours.

In this study, the participants emphasized the importance of program *mentors* and the sense of *belonging* that was created within the program as key factors that contributed to enjoyment of the program. Specifically, through examination of the emergent themes related to their mentors’ personal characteristics, the environment created, and social connections, it is evident that the mentors created positive relationships with the girls and the girls felt part of a supportive learning environment. Furthermore, in line with previous research (Gilligan, 1982; Goodenow, 1993; Hirsch et al., 2000; Loder & Hirsch, 2003), the findings in the current study

also support the importance of social connections for adolescent girls. For example, the participants discussed the friendships they developed, their sense of belonging and bonding with others, sharing lessons learned with others, and feeling like family with the participants and mentors. Thus, from the participants' perspective, an important and positive component of the program was the social context that was fostered in which girls reported a sense of connection to the other participants and the mentors.

In terms of changes resulting from the program, girls reported improvements in a variety of broad areas. Participants in this study specifically discussed enhanced cognitions and behaviours toward healthy eating and physical activity, as well as improvements in how the girls felt about themselves as a result of attending the program. Participants also noted a culture of positive health behaviours supported by mentors and other participants in the program (i.e., social support). While the findings in the current study are the first to report perceptions of changes in healthy eating and physical activity behaviour (i.e., studies have only reported changes in health-enhancing cognitions and not behaviours resulting from mentoring programs; Neumark-Sztainer et al., 2010; Story et al., 2003), the findings are consistent with other studies that highlight the importance of developing social connections in mentoring relationships. Indeed, both theory and research in the mentoring domain suggest that it is by virtue of developing social connections with others (i.e., the mentors and other participants) that mentees' (i.e., participants in this study) cognitions and behaviours are enhanced (J. E. Rhodes, 2005, 2008; J. E. Rhodes et al., 2008). For example, Deutsch and colleagues (2013) found that higher satisfaction with one-on-one mentoring relationships (i.e., good quality interpersonal connections) was associated with more frequent displays of positive social behaviours (e.g., caretaking) in the group-based component of the program. As social connections and a sense of

belonging appear to be a salient component of this program, future work is warranted to examine if the degree to which a participant feels they experience belonging within their group predicts changes in the cognitions and behaviours targeted in the program.

From a program evaluation perspective, it is important to consider the participants' suggested strategies to improve the program. Consistent with all of the participants' reported general positive perceptions of the program, the most common suggestions were to make the program longer (six of the participants made this suggestion) and to keep the program the same (suggested by five of the participants). These suggestions are in line with the participants' general reports of strongly enjoying the program; suggesting that the girls may want to spend more time in programs that they enjoy. Other than extending the length of the program, one low cost and sustainable suggestion may be to consider offering a booster session (or sessions) to girls after they have completed the program (i.e., a reunion for previous participants after the 7 week program has ended). This suggestion is in line with the protocol from another group-based lifestyle intervention for adolescents (Martin et al., 2009). Specifically, such a booster session could involve reminding participants about key lessons learned in the original program and help resolve any current issues faced by the girls.

Although the findings of this study are important to advance our understanding of participants' experiences in the *Go Girls!* program, limitations should also be noted. In particular, given the qualitative nature of the study (including retrospective accounts of cognitions and feelings before the program and reported improvements in behaviours), our ability to draw causal claims about the effects of the program is limited. However, the findings do provide important insight into understanding adolescent girls' experiences in a program that targets health behaviours within a context that promotes social connections. A second limitation

relates to the fact that participants in the study consisted of only girls who completed the *Go Girls!* program. In future research it might be pertinent to interview girls who dropped out to see how the program could be modified to maximize retention of this at risk group.

Notwithstanding the limitations of the current study, the findings are important to consider in implementing health promotion programs for adolescent girls. Specifically, the use of an open-ended interview-based qualitative methodology allowed the participants to express their interpretation of their experiences in the program in their own words. Indeed, this enabled us to identify the quality, nature, and range of relationships developed and changes experienced as a result of girls' participation in the program. Furthermore, identification of the components that girls' enjoyed and those that could be improved can be used to inform future research, practice, and policy. Given the importance of improving health behaviours among adolescent girls (e.g., Colley et al., 2011b; Pearson et al., 2011), findings from the current study suggest that programs that target health-enhancing behaviour change (i.e., physical activity and diet) through mentorship models and foster belongingness may provide a valuable framework for health promoters.

Chapter 6: General Discussion

Ever since Baumeister and Leary's (1995) seminal paper on the belongingness hypothesis the need to belong has become a widely studied phenomenon. Research over the past two decades provides evidence of the wide range of effects of our innate drive to feel optimally connected to other people. Indeed, findings from a variety of studies suggest the need to belong and belonging can influence emotions, cognitions, physiology and behaviours (e.g., Baumeister et al., 2005; Cwir et al., 2011; DeWall et al., 2008; Twenge et al., 2001; Twenge et al., 2007; Walton et al., 2011). More recently, particular attention has been paid to belonging in relation to health outcomes and behaviours (e.g., Begen & Turner-Cobb, 2012; Bond et al., 2007; Hale et al., 2005; McNeely & Falci, 2004). Guided by Baumeister and Leary's (1995) belongingness hypothesis, the purpose of this dissertation was to examine the effects of the need to belong and a sense of belonging in relation to health-enhancing cognitions and behaviours among young adults and adolescent girls. The overall purpose of this chapter is to (a) discuss the novel contributions and implications of the findings presented in this dissertation, and (b) consider study limitations and outline future directions worthy of inquiry.

Novel Contributions and Implications of the Research

The findings presented in this dissertation offer important contributions to the belonging, mentoring and translational behavioural medicine literatures from theoretical, methodological, statistical and applied perspectives. Building on Baumeister and Leary's (1995) belongingness hypothesis, findings presented in this dissertation (a) provide initial support for the need to belong as a potential motive to engage in health behaviours (chapter 2) and (b) are consistent with theory in the mentoring domain in that fostering belonging appears to be an important contextual factor of health promotion programs (chapters 3-5). Results from all of the studies

(except Study 1 in chapter 2) provide evidence of ecological validity as behaviours were examined in real-world settings, and as such, the findings are applicable to similar populations (i.e., university students and adolescent girls). From a statistical perspective, the use of multilevel analyses conducted in chapters 3 and 4 represents a particular strength of the dissertation, as these analyses controlled for the nested nature of the data. Finally, the findings presented in chapters 3, 4 and 5 are particularly relevant to applied settings as the results from a program evaluation of a widely disseminated program for adolescent girls are presented and discussed. These novel contributions are discussed in greater detail in the following section.

Application of the belongingness hypothesis to the health promotion domain. As Baumeister and Leary (1995) suggest, in order to promote optimal functioning, humans have a need to belong that must be satisfied. When our need to belong is not satisfied, we are driven to engage in behaviour(s) to satisfy this need. Guided by the belongingness hypothesis and building on work by DeWall and colleagues (2008) that demonstrated socially rejected (versus accepted) people performed significantly better on a self-regulatory task when performance on the task was presented as indicative of social skills, findings presented in chapter 2 suggest that this phenomenon can shape health-enhancing social cognitions. Furthermore, although participants in both conditions reported enhanced self-regulatory efficacy and increased physical activity behaviour in Study 2, participants (i.e., lonely individuals) who read the social skills message also reported significant increases in sense of belonging. Considering the positive effects associated with a sense of belonging in relation to health status (Begen & Turner-Cobb, 2012; Hale et al., 2005), health promotion initiatives that can increase physical activity behaviour *and* improve feelings of belonging offer additional benefits to lonely individuals (i.e., these individuals may attain health benefits from physical activity as well as improved health status

associated with a higher sense of belonging). The theoretical contributions of the research presented in chapter 2 suggest that a drive to fulfill the need to belong can increase motivation to engage in health behaviours.

The findings from chapter 2 have direct implications for health promoters and support further exploration of using the need to belong as part of a framework to guide health promotion initiatives. For example, future work is encouraged that uses a refined social belonging intervention examining the use of tailored messages to motivate individuals at risk of and/or who report feeling socially rejected to engage in physical activity. A refined social belonging intervention could involve (a) a message that highlights the sense of belonging one will feel when exercising with a group of similar other people, and/or (b) asking participants to *reflect on* the message they read. Drawing from Walton and Cohen (2011), reflection and/or elaboration on a social belonging message may increase the salience (and effects) of the message. Considering the prevalence of feelings of loneliness (Davis & Smith, 1998; Hawkey & Cacioppo, 2010; Victor & Yang, 2012), poor health status of lonely individuals (Hawkey & Cacioppo, 2010; Hawkey, Thisted, Masi, & Cacioppo, 2010; Heinrich & Gullone, 2006), and health benefits attainable from engaging in regular physical activity (Tremblay et al., 2011), increasing physical activity behaviour among individuals suffering from social exclusion represents a critical area of future research. In sum, given the recent calls for innovative interventions that target health behaviours in specific at-risk lonely populations (Hawkey & Cacioppo, 2010), the findings presented in chapter 2 provide support for a novel framework to guide health promotion initiatives for people at risk of or who feel socially excluded (i.e., lonely individuals, the elderly, those with disabilities and those who are overweight).

While the theoretical contributions from chapter 2 suggest that a *drive* to fulfill the need to belong can positively influence health-enhancing cognitions and behaviours, the findings presented in chapters 3-5 support the theoretical contention that *promoting* a sense of belonging to a health promotion program can facilitate a safe and supportive context to foster important cognitions and behaviours among adolescent girls. Indeed, findings presented in chapter 3 suggest that participants in this program that targeted belonging reported significant improvements in health-enhancing cognitions and behaviours. Consistent with the belongingness hypothesis (Baumeister & Leary, 1995), these findings also build on J. E. Rhodes' (2005) model of mentoring, in which J. E. Rhodes stipulated that the development of social connections between a mentor and mentee is the basic component of an effective mentoring relationship. These results are also in line with previous studies using the group-mediated cognitive-behavioural framework designed to foster sustained engagement in physical activity (i.e., results provide evidence of successful long-term changes ranging from 1-6 month follow-up; Brawley et al., 2000; Cramp & Brawley, 2006; Wilson et al., 2012). Brawley, Rejeski and Lutes (2000) postulate that the creation of a supportive and cohesive group environment is one of the main mechanisms through which these interventions are successful. While belonging and group cohesion are distinct concepts¹², both involve connections with others (Baumeister & Leary, 1995; Carron & Brawley, 2000).

Furthermore, considering evidence that suggests social connections are associated with positive outcomes (e.g., in youth sport camp settings, Ullrich-French et al., 2012; school settings,

¹² Although conceptually similar, group cohesion and belonging are subtly different. Cohesion refers to “a dynamic process that is reflected in the tendency for a *group to stick together* and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs” (Carron, Brawley & Widmeyer, 1998, p. 213); whereas belonging is the extent to which *people feel socially connected* (Baumeister & Leary, 1995).

Bond et al., 2006), it is plausible to propose that a sense of belonging to the program was an important contextual factor that may have provided a salient context for adolescent girls to develop health-enhancing cognitions (chapters 3 and 4). Although further experimental research is needed to clearly demonstrate causality, these findings have important implications for group-based mentoring health promotion programs for adolescent girls. Specifically, findings from this dissertation provide preliminary support for the conclusions that group-based mentoring programs that aim to foster connections (a) are associated with enhanced cognitions and behaviours at the end of the program and 7 weeks after program completion (chapter 3) and that cognitions measured at the end of the program predict behavioural outcomes 7 weeks later (chapter 4), and (b) are reported as highly enjoyable by adolescent girls (chapter 5). Given the low levels of physical activity and unhealthy dietary behaviours among adolescent girls (Colley et al., 2011b; Riediger et al., 2007), interventions that successfully change behaviours are vital. In light of the findings from the manipulation check that indicated participants on average reported a high sense of belonging to the *Go Girls!* group, continued research should be conducted to test causal relationships between belonging and program outcomes (i.e., health-enhancing cognitions and behaviours). In sum, the findings in chapters 3-5 provide preliminary evidence that fostering belonging to a mentoring group provides a positive context for targeting health-enhancing cognitions and behaviours for adolescent girls.

Ecological validity of belonging in health promotion. In addition to the theoretical advancements pertaining to development of health promotion programs for at risk individuals, the findings from this thesis provide an important contribution to the literature because of the assessment of the effects of the need to belong and a sense of belonging in a real-world setting. For example, in Study 2 presented in chapter 2, the effects of a social belonging intervention on

exercise cognitions and independent exercise behaviour were examined over a 2 week period among lonely university students. In addition, the findings presented in chapters 3-5 concern outcomes from a school-based health promotion program that aimed to foster a sense of belonging among adolescent girls. Evidence for ecological validity was provided because these studies were conducted in a natural setting (Brewer, 2000). As Brewer (2000) states, ecological validity refers to “whether an effect has been demonstrated to occur under conditions that are typical for the population at large” (p. 12). Using ecologically valid study designs, results presented in this dissertation revealed information regarding using the need to belong and belonging in the health promotion domain for lonely university students and adolescent girls.

Much of the previous work examining the belongingness hypothesis has typically involved experimental manipulation of participants’ feelings of belonging (i.e., inducing a feeling of social exclusion or inclusion; e.g., DeWall et al., 2008; Twenge et al., 2001; Twenge et al., 2007). These experimental studies have provided important building blocks in understanding how social rejection and inclusion affect emotions, cognitions, physiology and behaviour in controlled laboratory settings. Other researchers have used cross-sectional studies to examine concurrent relationships between belonging and health outcomes. Findings from these studies point to the positive effects of a higher sense of belonging including better health status (in terms of subjective reports for women and number of symptoms reported by men; Hale et al., 2005) and positive affect (Begen & Turner-Cobb, 2012). However, researchers have yet to examine the use of the need to belong to motivate people to engage in health behaviours. The results from chapter 2 provide the first empirical test of using the need to belong to influence health-enhancing cognitions and behaviour (i.e., physical activity). Furthermore, the results from chapters 3-5 provide the first empirical examination of the effects of a group-based mentoring

program that promotes social belonging on changes in physical activity and dietary behaviours and related social cognitions. While the findings from this dissertation can be generalized to other similar populations (i.e., university students, chapter 2; adolescent girls in urban cities, chapters 3-5), further research is warranted to examine the extent to which these types of social belonging interventions are generalizable to other populations (e.g., individuals who feel lonely/who are at risk of social isolation such as those with disabilities, the elderly, or who are overweight). In sum, the ecologically valid findings from these studies have direct relevance to practitioners interested in using the need to belong and belonging as part of a framework to guide interventions.

Controlling for group level effects. Following recommendations by Hayes (2006), multilevel modelling was employed in chapters 3 and 4 because the nested nature of the data (i.e., repeated measures within girls who were also nested within groups) violated the assumption of independence between observations. Furthermore, non-independence of measurements renders the use of standard analytic techniques including analysis of variance and ordinary least squares regression inappropriate (Bliese & Hanges, 2004). Through the use of multilevel modelling in both chapters 3 and 4, the studies in this dissertation examined individual level outcomes while controlling for group level effects. Researchers over the past decade have highlighted the importance of controlling for nested data (e.g., Bliese & Hanges, 2004; Hayes, 2006; Hox, 2002), as such, the use of appropriate data analytic techniques in this dissertation represents an important contribution to the behavioural medicine literature. While the majority of the variance in the dependent measures assessed in chapters 3 and 4 was observed at the individual level (group level ICCs $\leq .103$, see Table 3.2 for all values), Hayes (2006) suggests that the use of multilevel modelling is still important because single level tests are inappropriate

when there is variation at level 2. At the same time, Preacher, Zyphur and Zhang (2010) caution researchers to ensure there is some between group variation to warrant the use of multilevel modelling. Given that the group level ICCs ranged from .010 - .103 and girls were nested within groups, multilevel modelling was deemed an appropriate analytic technique for these data.

Furthermore, it should be acknowledged that although the intervention was a group-based program, the intervention was delivered at the *individual level* (i.e., the program targeted each of the girls' cognitions and behaviours through theory-based activities). This is an important consideration as examination of the intervention at a group versus individual level changes the research question in subtle, yet important ways. Specifically, I was interested in *individual's changes* in cognitions and behaviours over time (chapter 3) and how *individual's cognitions* at the end of the program predicted individual behaviours 7 weeks after the program had ended (chapter 4). As such, through the use of multilevel modelling in these studies, I examined the effects of the program at the individual level, while controlling for any group level effects. Another option could have been to examine *changes in the groups'* cognitions and behaviours over time and if the *groups' cognitions* at the end of the program predicted behaviours 7 weeks after program completion. This type of design would be more appropriate when there is something different or substantively unique about each of the groups, and as such, we would expect group level differences in the outcomes. For example, if some of the mentors had specific training and others did not, it would be beneficial to see if as a whole, groups with mentors who had specific training reported different outcomes compared to those whose mentors did not have such training (Preacher et al., 2010).

Evaluation of a theory-based health promotion program for adolescent girls: What have we learned? In the second half of this dissertation, I presented the findings from a program

evaluation of the *Go Girls!* program. Findings from chapters 3-5 provided evidence that participants reported significant increases in the majority of the psychosocial (i.e., self-regulatory efficacy and intentions) and behavioural (i.e., physical activity and dietary behaviours) outcomes targeted in the program (chapter 3). However, compared to baseline scores (i.e., the average of the Time 1 and Time 2 scores), participants reported significant reductions in affective attitudes toward physical activity (at Time 3) and instrumental attitudes toward healthy eating (at Time 4) and no significant changes in the other attitudes. These findings suggest that strategies used in the program could be improved to (a) make physical activity and healthy eating more fun and enjoyable for the participants (i.e., affective attitudes) and (b) help girls understand to a greater extent why engaging in physical activity and healthy eating are important (i.e., instrumental attitudes). Furthermore, the importance of programs that *effectively* target self-regulatory efficacy, attitudes and intentions is particularly prudent given the findings presented in chapter 4. Specifically, consistent with the theory of planned behaviour, participants' attitudes, self-regulatory efficacy, and intentions reported at the end of the program were key cognitions that prospectively predicted adolescent girls' physical activity and dietary behaviour 7 weeks after program completion. As such, to enhance program effectiveness in increasing health-enhancing behaviours, the use of strategies that *effectively* bolster these cognitions is vital.

Furthermore, findings from program participants' discussion of their experiences in the program were categorized into two broad themes, namely *general components of the program* and *program outcomes* (chapter 5). In addition to discussing overall positive perceptions of the program and positive changes in thoughts and behaviours as a result of participating in the program, all participants also discussed the development of positive social connections. The qualitative reports from interviews with the participants provided rich information regarding the

meaning of the connections girls reported developing in the program. Specifically, participants reported developing friendships, feeling a sense of belonging and bonding, and feeling like family with the other group members and mentors. Participants also described how much they enjoyed spending time with the mentors and provided examples of how the mentors helped them cope with issues such as poor body image. These qualitative reports provide an in-depth understanding of the type of socially connected context that was created within the groups. In sum, evidence of the importance of belonging in this program was provided by the qualitative reports that explained how social connections were a valuable and enjoyable component of this program.

Additional feedback for Big Brothers Big Sisters of Canada. Notwithstanding the overall positive findings pertaining to health-enhancing cognitions and behaviours associated with the *Go Girls!* program presented in this thesis, as part of the program evaluation, additional data were collected and analyzed to provide in-depth feedback to Big Brothers Big Sisters of Canada. As recommended by J. E. Rhodes (2008), data on attendance (i.e., actual attendance as reported by the mentors), program dose (i.e., average and total session duration) and implementation fidelity (i.e., degree to which the mentors felt the session was delivered as outlined by the program manual) were collected to examine the extent to which these factors moderated the effects observed in the outcome and mechanism evaluation (i.e., chapters 3 and 4, respectively; see Appendix C for additional information). Although I attempted to collect this information from all of the groups involved in the program evaluation, only a subset of the mentors actually provided these data; as such, combined with missing data from the dependent variables, I did not have enough power to run these moderation analyses. Thus, I was unable to conclude whether or not these factors moderated the effects of the program on the health-

enhancing cognitions and behaviours targeted. Assessment of attendance, program dose and implementation fidelity and the corresponding moderating effects on important program outcomes remains an important avenue for future research.

Based on information obtained through review of the *Go Girls!* program manual and the findings from the other components of the program evaluation (i.e., results presented in chapters 3, 4 and 5), a number of areas for potential program improvement were identified. In developing the recommendations for program improvement, these issues were discussed with the program director in order to ensure recommendations were provided in a manner that was meaningful and action oriented. Through consultation with the program director, eight recommendations were provided to Big Brothers Big Sisters which included: consider making the program longer; ensure schools are ready, willing and able to deliver the *Go Girls!* program; consider providing age appropriate adaptations for activities; ensure girls understand they can share lessons learned in the program; update the program manual to provide mentors with evidence-based nutrition information; update the program manual to provide mentors with evidence-based physical activity information; ensure mentors provide healthy snacks; and areas for further scientific exploration (see Appendix C for detailed information). A summary of the findings and a detailed discussion of the results and recommendations was provided to Big Brothers Big Sisters in a final report (Dowd, Beauchamp, & Jung, 2014).

Limitations of the Studies and Future Directions

Several delimitations and limitations that pertain to the work presented in this dissertation should also be addressed and reflected upon. Drawing from these considerations, directions for future research are outlined.

A broad delimitation of the research presented in chapters 3-5 is that only adolescent girls were examined in the context of a group-based mentoring lifestyle program. Although targeting health behaviours among adolescent girls is an important health promotion initiative, evidence from the behavioural medicine literature suggests that adolescent boys are also in need of effective evidence-based health promotion initiatives. For example, on average, adolescent boys consume 1.35 sweetened processed foods per day (Pearson et al., 2011) and only 1.2% meet the recommendations for fruit and vegetable consumption (Guenther, Dodd, Reedy, & Krebs-Smith, 2006). In relation to physical activity, only 1 in 5 adolescent boys engage in moderate-vigorous physical activity on at least 5 days/week (Colley et al., 2011b). Furthermore, considering the numerous health risks associated with excessive sedentary behaviour (Tremblay, Colley, Saunders, Healy, & Owen, 2010), findings that 89.7% of adolescent boys exceed recommendations for screen time per week (Hardy, Denney-Wilson, Thrift, Okely, & Baur, 2010) are particularly alarming. Thus, evidence-based health promotion programs designed to improve health behaviours among adolescent boys are an important area of future research.

Drawing from previous research (e.g., Furrer & Skinner, 2003; J. E. Rhodes, 2005) and building on the findings presented in this dissertation, fostering belonging could be an important component of effective health promotion programs for adolescent boys. However, consideration of gender differences in the need to belong is useful when developing evidence-based health promotion programs for adolescent boys. Baumeister and Sommer (1997) suggest that both males and females have a need to belong, however, this need is experienced and expressed differently in males and females. Females experience a need to belong to close, intimate circles of others, whereas males experience a need to feel connected to a larger sphere of others, albeit less closely. In addition to Baumeister and Sommer's (1997) work on gender differences in the

need to belong, researchers have also explored gender differences in the loneliness domain. Heinrich and Gullone (2006) suggest that reported gender differences in levels of loneliness among adolescents are due to measurement (i.e., boys are less likely to report feeling lonely, however when loneliness is assessed through measures that do not specifically use the word lonely, no gender differences exist). Drawing from a recent set of studies in the *Journal of Adolescence*, a number of risk factors predict loneliness among *both* adolescent boys and girls including low peer acceptance (Qualter et al., 2013) and low social skills (Schinka, van Dulmen, Mata, Bossarte, & Swahn, 2013). Furthermore, among both boys and girls, loneliness in childhood prospectively predicted a number of negative outcomes in adolescence including depression, lower perceived health, a higher frequency of doctor visits (Qualter et al., 2013), social skills deficits, aggression and suicide ideation (Schinka et al., 2013). These findings provide support for the need for programs that promote belonging among adolescent girls (such as *Go Girls!*), as well programs that target social connections among adolescent boys. Future research is warranted to examine how best to incorporate belonging in a salient manner for adolescent boys in health promotion programs.

Another broad delimitation of the research presented in this dissertation surrounds the scope and design of the *Go Girls!* program evaluation. That is, this research was designed as a prospective longitudinal evaluation of a community-based program. Community-based research has certain boundaries and restrictions due to a number of factors including limited resources and feasibility issues. While randomized controlled trials are often viewed as the gold standard to enable causal claims of health promotion programs (Shadish, Cook, & Campbell, 2002), this design is not always feasible from a pragmatic standpoint. After numerous discussions with the *Go Girls!* program coordinators about the purpose of the evaluation, it was decided that the most

feasible way to collect data that would provide some indication of a comparison group would be to conduct a time series design in which all participants completed measures at two pre-program time points (Time 1 = 7 weeks before starting the program and Time 2 = immediately before starting the program; Bonell et al., 2011). This pre-program baseline assessment period enabled comparison of participants' changes during and after the 7 week *Go Girls!* program to changes typically observed in these individuals during a 7 week period prior to the program. One of the strengths of this design is that it minimizes the potential for regression to the mean to explain changes in the outcomes during and after the program (Bonell et al., 2011). Specifically, because no changes were found during the baseline assessment period (i.e., between Time 1 and 2), changes in elevated scores reported at Time 3 or 4 are unlikely to be due to regression to the mean (Bonell et al., 2011). Furthermore, regardless of a range of locations (39 different schools) and mentors (78 mentors), effect sizes were in the medium-large range for improvements in the majority of the outcome variables (chapter 3). These findings are consistent with the a priori theory-based hypotheses and the qualitative reports from the participants (chapter 5). As such, findings from this program evaluation provide preliminary evidence that the *Go Girls!* program is effective and warrant future studies that include a comparison (control) group with a view to establish strong evidence for causal effects of the program on targeted outcomes.

Although the data analytic procedures used in chapters 3 and 4 (i.e., hierarchical linear modelling and multilevel structural equation modelling) are both causal statistical techniques, use of these techniques is not sufficient to make causal claims between the variables in the model (Preacher et al., 2010). Indeed, to strengthen causal conclusions, a number of factors must be considered including the use of theory to delineate relationships between variables of interest, temporal precedence of the variables measured and use of a study design that rules out third

variables (Preacher et al., 2010). Furthermore, it should be made explicitly clear that while the program evaluation was theory-driven and the variables were measured in temporal precedence, the design did not allow for definite causal conclusions regarding the cause of the changes observed during the program. In other words, given the study design used in chapters 3 and 4, one cannot be completely sure that the changes observed at the end of at the program and at follow up were due solely to the program itself, and not any external factors. As previously stated, future work involving a comparison group and/or a randomized controlled design is necessary to draw causal conclusions.

Moreover, as I interpreted the data from the program evaluation, I tried to be responsive to being appropriately conservative without being too conservative in my conclusions. Indeed, overly conservative conclusions when conducting community-based research may hinder the translation of effective evidence-based programs into practice. Given that the *Go Girls!* program was designed to use evidence-based techniques to target theory-based social cognitions (i.e., attitudes, self-efficacy and intentions), there is preliminary reason to be confident that the program is on the right track (Rychetnik, Frommer, Hawe, & Shiell, 2002). Furthermore, consideration that the qualitative findings (i.e., from interviews with participants reported in chapter 5) support the quantitative findings also provides further evidence that the program has beneficial effects (Bonell et al., 2011).

In addition to the time-series study design for the program evaluation, another broad methodological limitation of the research presented in this dissertation concerns the use of predominantly self-reported measures. While it is important to obtain an understanding of the participants' perceptions of their cognitions and behaviours, limitations exist with the use of self-reported data. Indeed, numerous researchers highlight potential for over-reporting bias

specifically regarding physical activity (Adamo, Prince, Tricco, Connor-Gorber, & Tremblay, 2009) and dietary (Schoeller, 1995; Schoeller et al., 2013) behaviours. If this is/was the case, we would expect that participants would systematically over-report engaging in these health behaviours; thus, as reported in chapter 3, considering *no significant changes* were reported during the baseline comparison period (i.e., between Time 1 and Time 2), the significant *improvements* in physical activity and dietary behaviour at Time 3 and Time 4 remain meaningful. However, as Hall (2014) recommends, the field of health psychology could be improved by the development of creative techniques to assess cognitions and behaviours. Research into such tools to expand from predominantly self-reported measures is an important avenue of future exploration in the field of health psychology.

A broad conceptual limitation of this dissertation surrounds the conceptualization of belonging. In chapter 2, I examined belonging as a global construct. Specifically, the intervention material targeted general social skills, or a general desire to feel connections with others. This procedure is consistent with previous experimental manipulations (DeWall et al., 2008) and the results provide preliminary support for using a desire to belong to motivate physical activity cognitions and behaviours. However, this global conceptualization of belonging does assume that people are motivated to fulfill a general feeling of belonging. Drawing from Baumeister and Sommer (1997), some people (i.e., women) may be more motivated to belong to groups of close others, whereas others (i.e., men) may be more likely to want more shallow connections with more people.

In terms of being connected to a specific group, the accumulated empirical evidence to date suggests this desire can influence peoples' behaviours. Indeed, people who feel socially excluded may cling to the first and/or easiest opportunity they perceive that will make them feel

socially included in a group (Baumeister & Leary, 1995). An urge to fulfill this need may manifest in a number of outcomes including joining a gang (e.g., Taylor, 1990), an extreme religious group (e.g., Scientology; Velasquez, 2011), or excessive engagement in behaviours in order to achieve an identity associated with feeling included (e.g., extensive over-exercising; Edmunds, Ntoumanis, & Duda, 2005). However, feeling a sense of belonging to a group can also be related to positive outcomes. For example, community belonging is associated with healthy behaviours (Hystad & Carpiano, 2012), school belonging is associated with improved academic performance (Bond et al., 2007), and sense of belonging to a program predicts attendance at an after-school program (Anderson-Butcher & Conroy, 2002). Considering the data presented in chapter 3, participants reported a sense of belonging to the *Go Girls!* group and also reported significant improvements in health-enhancing cognitions and behaviours after completing the program. Future research is warranted to examine if and how a drive to feel connected to a specific group of others could be used to motivate health behaviours among individuals low in belonging (i.e., those who feel lonely).

Belonging as a component of social support. The research presented in this dissertation drew from Baumeister and Leary's (1995) operationalization of the need to belong. Research in other domains suggests that belonging is related to broader concepts including social support and self-compassion. For example, Hale and colleagues (2005) examined the effects of social support on health outcomes. These researchers conceptualized social support as comprised of tangible support, belonging (i.e., feeling connected to a group of others), social intimacy and disclosure. Interestingly, they found that of these four components of social support, only belonging predicted health outcomes (such as poor perceptions of health among women and more physical symptoms among men) among college students. These findings support the belongingness

hypothesis such that when this innate need is not fulfilled, it is associated with ill effects (Baumeister & Leary, 1995). However, other forms of social support may be more relevant with different populations (e.g., those with poor health status). Future research is warranted to disentangle the types of social support needed and the role of belonging in supporting/debilitating health outcomes among at risk populations such as those who feel/at risk of social exclusion and poor health status.

Belonging and self-compassion. A related but conceptually distinct concept to belonging is self-compassion, which involves feelings of a common sense of humanity. Although a common sense of humanity (e.g., understanding that tough times experienced as a human are normal because other people go through difficult times as well; Neff, 2003a, 2003b) is similar to belongingness, it is noteworthy that Neff (2003a, 2003b) conceptualizes self-compassion as also involving components that are different from belongingness, including self-kindness and mindfulness. In light of evidence that suggests self-compassion is positively related to self-regulation (for a review see Terry & Leary, 2011), a promising line of research would involve examining if fostering self-compassion compliments and/or augments the effects of belongingness in the context of a health promotion program. Future research is warranted to examine if belonging and self-compassion predict unique variance in salient outcomes and this could be examined in the context of programs that target at-risk populations such as the *Go Girls!* program.

Summary

The findings presented in this thesis provide valuable insight into the need to belong and a sense of belonging in a health promotion context. Specifically, the findings provide preliminary evidence that (a) the drive to fulfill the need to belong can motivate health-enhancing cognitions

and behaviours (chapter 2) and (b) creating a sense of connections among adolescent girls is a salient contextual factor in a group-based mentoring lifestyle program (chapters 3-5). In sum, the research presented in this dissertation provides an empirical basis to develop future studies that explore the role of the need to belong and belonging in experimental and health promotion settings with an ultimate goal of translating the findings into practice.

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Appendices

Appendix A

A.1 Participant Letter of Information – Study 1

Letter of Information Study of Personality & Health Behaviours

What's Involved?

This is a lab-based study which will involve completing several questionnaires. This study will take less than 30 minutes to complete.

Am I Eligible to Participate?

We are currently looking for adults who are between the ages of 18-29 years to participate in this study. If you are eligible and would like to participate, please contact Justine Wilson at the email address listed below.

What are the Benefits of Participating in this Study?

If you agree to participate in this study you will receive \$10.

What are the Risks Associated with this Study?

It is possible that you may experience some temporary discomfort during this study. However, it is anticipated that any discomfort will be minor and will pass upon study completion.

Will the information I Provide Remain Confidential?

Yes! The data collected for this study is done so solely for research purposes. The data that you provide in this study will remain completely confidential and will not be linked to your name or student number. All completed questionnaires will be stored in a secured room in the War Memorial Gym.

A.2 Participant Consent Form – Study 1



Letter of Information and Consent Form Personality & Health Behaviours

Principal Investigator:
Mark R. Beauchamp, Ph.D.
School of Kinesiology
University of British Columbia

Co-Investigator:
A. Justine Wilson, MA
School of Kinesiology
University of British Columbia

Purpose:

The present study involves an examination of the relationship between personality, social skills and thoughts about health behaviours.

Study Procedures:

This is a lab-based study which will involve completing several questionnaires. This study will take less than 30 minutes to complete.

Potential Risks:

It is possible that you may experience some temporary discomfort during this study. However, it is anticipated that any discomfort will be minor and will pass upon study completion.

If you have any questions about what is involved please contact Justine Wilson by email or phone. Her email address and phone number are at the top of this page.

Alternatively, if you have any concerns about your rights or treatment as a research subject please contact the 'Research Subject Information Line' in the UBC Office of Research Services at (604) 822-8598 or, if you prefer email, at: RSIL@ors.ubc.ca.

Confidentiality:

The data collected for this study is done so solely for research purposes. The data that you provide in this study will remain completely confidential and will not be linked to your name or student number. All completed questionnaires will be stored in a secured room in the War Memorial Gym.

Contact for information about the study:

If you would like further information about the study, please contact Justine Wilson (see above for email, phone number, and mailing address).

Consent:

I consent to take part in this research, designed to increase exercise behaviour. The study has been explained to me and I understand what is involved.

I understand that my participation in this study is entirely voluntary and that I may withdraw from the study at any time without having to give any reason for doing so, and without experiencing any negative consequences. I have received a copy of this consent form for my own records.

By signing this form you have consented to participate in this study.

SIGNED.....

NAME IN BLOCK LETTERS.....

DATE.....

Thank you for your help,

Mark Beauchamp, PhD

Justine Wilson, MA

A.3 Participant Debriefing Letter – Study 1

Debriefing Form

Personality and Health Behaviours

Thank you for your participation in this study. This study was initially presented to you as an investigation designed to examine personality traits and health behaviours. **We were actually interested in whether being told to expect a future alone (socially isolated condition) or with others (socially included condition) had an effect on people's thoughts about exercise. Specifically, we wanted to see if social isolation or inclusion (i.e., told you can expect a future alone vs. a future with others) affects people's intentions to exercise when people are either told that regular exercise is associated with social skills or told that regular exercise is important for health benefits.**

As a participant in the study, you were randomly placed into one of four conditions. These were: (Condition #1) you were told to expect a future alone and that exercise is associated with self-regulation and social skills, (Condition #2) you were told to expect a future alone and that exercise leads to health benefits, (Condition #3) you were told to expect a future with others and that exercise is associated with self-regulation and social skills, and (Condition #4), you were told to expect a future with others and that exercise leads to health benefits. Please note that the results you received about expecting a future alone or with others were not actually based on your personality test. **This information was not based on fact and was made up for the purpose of this study.**

If you feel uncomfortable with being deceived you are free to withdraw your data from this study without incurring any negative consequences.

All the information that you've provided in this study will remain confidential. That is, the responses that you provided will not be linked to you, your name, or student number in any manner. If you feel as though you have experienced an undue amount of stress or discomfort as a result of participating in this study you may contact UBC counseling services at 604-822-3811.

Due to the nature of this study, we ask that you refrain from leaving this form in a public area where a potential participant may see it. We also request that you do not tell others about the personality test or exercise intentions aspects of this study, so that we can continue to complete this investigation.

If you would like any information regarding the results of this study once it has been completed you may contact Dr. Mark Beauchamp or Justine Wilson. If you would like to express a concern about this experiment you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598, or, if you prefer email, at: RSIL@ors.ubc.ca.

A.4 Questionnaire – Study 1 & 2

Demographics

1. Place of Birth: _____ (City) _____ (Country)
2. Age: _____ (Years) _____ (Months)
3. Gender (please shade in the appropriate bubble): Male ☐ Female ☐
4. Please mark which of the following you identify with. PLEASE CHECK **ALL** THAT APPLY.

White	
Native/Aboriginal	
South Asian (e.g., East Indian, Pakistani, Sri Lankan etc.)	
Chinese	
Black	
Filipino	
Latin American	
Arab	
Southeast Asian (e.g., Vietnamese, Cambodian, Malaysian, etc.)	
West Asian (e.g., Iranian, Afghan, etc.)	
Korean	
Japanese	
Russian	
African	
Other (please specify)	_____

5. Are you currently in a romantic relationship? (Please shade in the appropriate bubble)
☐ Yes ☐ No

6. What year of study are you currently in? (Please circle the appropriate number)

Undergraduate Studies

1 2 3 4 5

Graduate Studies

Masters 1 2 3 4 PhD 1 2 3 4 5 6 7 8

7. In which program are you studying?

Faculty _____, Department/School _____

GODIN LEISURE TIME EXERCISE QUESTIONNAIRE

Considering the past **7-day period** (last week), how many times did you do the following kinds of exercise for **more than 15 minutes** during your free time (write the appropriate number in each square).

**TIMES
PER
WEEK**

1. STRENUOUS EXERCISE

(HEART BEAT RAPIDLY - i.e. running, jogging, hockey, football, soccer, squash, basketball, judo vigorous swimming, vigorous long distance cycling, roller skating)

How many minutes was each strenuous intensity exercise session (approximately)?
_____ minutes

2. MODERATE EXERCISE

(NOT EXHAUSTING - i.e. fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, dancing)

How many minutes was each moderate intensity exercise session (approximately)?
_____ minutes

3. MILD EXERCISE

(MINIMAL EFFORT - i.e. yoga, archery, bowling, golf, easy walking)

How many minutes was each mild intensity exercise session (approximately)?
_____ minutes

4. Considering the past 7-day period (last week), during your leisure-time, how often did you engage in any regular exercise long enough to work up a sweat (heart beats rapidly)?

OFTEN

SOMETIMES

NEVER/RARELY

☐☐☐

5. Was the past week of exercise similar to how much you exercised the week before?

Yes – Very Similar

Somewhat Similar

No – I exercised **much less** this week as compared to last week

No – I exercised **much more** this week as compared to last week

Instructions: Following are a number of statements that reflect various ways in which we view ourselves. Rate the degree to which you agree or disagree with each statement using the scale below. There are no right or wrong answers.

	Never	Rarely	Sometimes	Often	Always
1. I feel comfortable in the presence of strangers.	1	2	3	4	5
2. I am in tune with the world.	1	2	3	4	5
3. Even among my friends, there is no sense of brother/sisterhood.	1	2	3	4	5
4. I fit in well in new situations.	1	2	3	4	5
5. I feel close to people.	1	2	3	4	5
6. I feel disconnected from the world around me.	1	2	3	4	5
7. Even around people I know, I don't feel that I really belong.	1	2	3	4	5
8. I see people as friendly and approachable.	1	2	3	4	5
9. I feel like an outsider.	1	2	3	4	5
10. I feel understood by the people I know.	1	2	3	4	5
11. I feel distant from people.	1	2	3	4	5
12. I am able to relate to my peers.	1	2	3	4	5
13. I have little sense of togetherness with my peers.	1	2	3	4	5
14. I find myself actively involved in people's lives.	1	2	3	4	5
15. I catch myself losing a sense of connectedness with society.	1	2	3	4	5
16. I am able to connect with other people.	1	2	3	4	5
17. I see myself as a loner.	1	2	3	4	5
18. I don't feel related to most people.	1	2	3	4	5
19. My friends feel like family.	1	2	3	4	5
20. I don't feel I participate with anyone or any group.	1	2	3	4	5

Instructions: Please circle the number that corresponds to how you feel based on the scale below.

Never	Rarely	Sometimes	Often	Always
1	2	3	4	5

- 1 Does your mood often go up and down?
1 2 3 4 5
- 2 Do you take much notice of what people think?
1 2 3 4 5
- 3 Are you a talkative person?
1 2 3 4 5
- 4 If you say you will do something, do you always keep your promise no matter how inconvenient it might be?
1 2 3 4 5
- 5 Do you ever feel 'just miserable' for no reason?
1 2 3 4 5
- 6 Would being in debt worry you?
1 2 3 4 5
- 7 Are you rather lively?
1 2 3 4 5
- 8 Were you ever greedy by helping yourself to more than your share of anything?
1 2 3 4 5
- 9 Are you an irritable person?
1 2 3 4 5
- 10 Would you take drugs which may have strange or dangerous effects?
1 2 3 4 5
- 11 Do you enjoy meeting new people?
1 2 3 4 5
- 12 Have you ever blamed someone for doing something you knew was really your fault?
1 2 3 4 5
- 13 Are your feelings easily hurt?
1 2 3 4 5

- 14 Do you prefer to go on your own way rather than act by the rules?
1 2 3 4 5
- 15 Can you usually let yourself go and enjoy yourself at a lively party?
1 2 3 4 5
- 16 Are *all* your habits good and desirable ones?
1 2 3 4 5
- 17 Do you often feel 'fed-up'?
1 2 3 4 5
- 18 Do good manners and cleanliness matter much to you?
1 2 3 4 5
- 19 Do you usually take the initiative in making new friends?
1 2 3 4 5
- 20 Have you ever taken anything (even a pin or button) that belonged to someone else?
1 2 3 4 5
- 21 Would you call yourself a nervous person?
1 2 3 4 5
- 22 Do you think marriage is old-fashioned and should be done away with?
1 2 3 4 5
- 23 Can you easily get some life into a rather dull party?
1 2 3 4 5
- 24 Have you ever broken or lost something belonging to someone else?
1 2 3 4 5
- 25 Are you a worrier?
1 2 3 4 5
- 26 Do you enjoy co-operating with others?
1 2 3 4 5
- 27 Do you tend to keep in the background on social occasions?
1 2 3 4 5

- 28 Does it worry you if you know there are mistakes in your work?
1 2 3 4 5
- 29 Have you ever said anything bad or nasty about anyone?
1 2 3 4 5
- 30 Would you call yourself tense or 'highly strung'?
1 2 3 4 5
- 31 Do you think people spend too much time safeguarding their future with savings and insurance?
1 2 3 4 5
- 32 Do you like mixing with people?
1 2 3 4 5
- 33 As a child were you ever cheeky to your parents?
1 2 3 4 5
- 34 Do you worry too long after an embarrassing experience?
1 2 3 4 5
- 35 Do you try not to be rude to people?
1 2 3 4 5
- 36 Do you like plenty of bustle and excitement around you?
1 2 3 4 5
- 37 Would you like other people to be afraid of you?
1 2 3 4 5
- 38 Are you mostly quiet when you are with other people?
1 2 3 4 5
- 39 Do you often feel lonely?
1 2 3 4 5
- 40 Is it better to follow society's rules than go your own way?
1 2 3 4 5
- 41 Do other people think of you as being very lively?
1 2 3 4 5
- 42 Can you get a party going?
1 2 3 4 5

Instructions: Thinking about yourself and how you feel right now, please shade in the circle that corresponds to how you feel based on the scale below:

Slightly/Not at all					Extremely
1	2	3	4	5	
1. Upset 1	2	3	4	5	
2. Scared 1	2	3	4	5	
3. Alert 1	2	3	4	5	
4. Distressed 1	2	3	4	5	
5. Inspired 1	2	3	4	5	
6. Nervous 1	2	3	4	5	
7. Determined 1	2	3	4	5	
8. Enthusiastic 1	2	3	4	5	
9. Afraid 1	2	3	4	5	
10. Excited 1	2	3	4	5	

Intentions

1. Please indicate in the blank space below the average **number of times per week** that you **intend** to exercise over the next 2 weeks. Try to be as accurate as possible in your intentions.

On average, I will exercise _____ times per week over the next **2 weeks**.

Please circle the number below that corresponds to your intentions to exercise during the next 2 weeks using the scale below.

2. I **intend** to exercise for **at least 30 minutes, at least 3 times a week** over the next **2 weeks**.

1	2	3	4	5	6	7
Very Unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely

3. I **plan** to exercise for **at least 30 minutes, at least 3 times a week** over the next **2 weeks**.

1	2	3	4	5	6	7
Very Unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely

Instructions: For each question, please indicate how confident you are in your ability to manage that aspect of your exercise participation over the NEXT 2 WEEKS, using the following scale:

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at All					Somewhat					Completely
Confident					Confident					Confident

1. How confident are you that you can **motivate yourself to get at least 30 minutes of exercise a day, at least 3 times per week over the *next 2 weeks***?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

2. How confident are you that you can **use safe, effective exercise techniques (e.g., warm-up, stretching) over the *next 2 weeks***?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3. How confident are you that you can **schedule exercise sessions into your weekly routine so that you get at least 30 minutes, at least 3 times per week over the *next 2 weeks***?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

4. How confident are you that you can **plan exercise sessions that will be at least moderately difficult (e.g., have you breathing hard, your heart rate increases) over the *next 2 weeks***?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5. How confident are you that you can **monitor your exercise progress by recording what exercises you do, how often you do them and for how long over the *next 2 weeks***?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

6. How confident are you that you can **set realistic, weekly exercise goals for yourself (e.g., exercising for at least 30 minutes, on at least 3 days/week)** over the *next 2 weeks*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

7. How confident are you that you can **return to exercising after missing a session** over the *next 2 weeks*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

8. How confident are you that you can **monitor and regulate the intensity of your exercise so that it is at least moderately difficult** over the *next 2 weeks*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

9. How confident are you that you can **develop solutions to cope with potential barriers that can interfere with your exercise** over the *next 2 weeks*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

10. How confident are you that you can **plan exercises that fit within your other daily activities** over the *next 2 weeks*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

A.5 Participant Letter of Information – Study 2

Letter of Information Loneliness and Physical (In)activity

What's Involved?

This is a lab-based study that will involve completing a short questionnaire at 2 time points. Participants will also be invited to complete a brief activity designed to help them engage in more exercise. This study will take less than 20 minutes to complete at each time point.

Am I Eligible to Participate?

We are currently looking for people (ages 18-65) who have felt socially isolated in the past few months (i.e., who want to 'get out' more) and currently engage in moderate-vigorous intensity exercise on 2 or less days per week but would like to engage in more. If you meet these criteria and would like to participate, please contact Justine Wilson at the email address listed below.

What are the Benefits of Participating in this Study?

If you agree to participate in this study you will receive \$5.

What are the Risks Associated with this Study?

There are no known risks associated with participation in this study. If you have any questions about what is involved please contact Justine Wilson by email or phone. Her email address and phone number are at the bottom of this page.

Will the Information I Provide Remain Confidential?

Yes! The data collected for this study is done so solely for research purposes. The data that you provide in this study will remain completely confidential and will not be linked to your name or student number. All completed questionnaires will be stored in a secured room in the War Memorial Gym.

Thank you for your help,

Justine Wilson
School of Kinesiology
University of British Columbia

Mark Beauchamp, PhD
School of Kinesiology
University of British Columbia

A.6 Participant Consent Form – Study 2



Consent Form

Loneliness & Physical (In)activity

Principal Investigator:
Mark R. Beauchamp, Ph.D.
School of Kinesiology
University of British Columbia

Co-Investigator:
A. Justine Wilson, MA
School of Kinesiology
University of British Columbia

Purpose:

The present study involves an examination of the relationships between loneliness and physical activity.

Study Procedures:

This study will involve completing a short questionnaire at two time points (separated by 2 weeks). This study will take less than 20 minutes to complete at each time point.

Potential Risks:

There are no known risks associated with participation in this study. If you have any questions about what is involved please contact Justine Wilson by email or phone. Her email address and phone number are at the top of this page.

Alternatively, if you have any concerns about your rights or treatment as a research subject please contact the 'Research Subject Information Line' in the UBC Office of Research Services at (604) 822-8598 or, if you prefer email, at: RSIL@ors.ubc.ca.

Confidentiality:

The data collected for this study is done so solely for research purposes. The data that you provide in this study will remain completely confidential and will not be linked to your name or student number. All completed questionnaires will be stored in a secured room in the War Memorial Gym.

Contact for information about the study:

If you would like further information about the study, please contact Justine Wilson (see above for email, phone number, and mailing address).

Consent:

I consent to take part in this research designed to help me engage in more exercise. The study has been explained to me and I understand what is involved.

I understand that my participation in this study is entirely voluntary and that I may withdraw from the study at any time without having to give any reason for doing so, and without experiencing any negative consequences. I have received a copy of this consent form for my own records.

By signing this form you have consented to participate in this study.

SIGNED.....

NAME IN BLOCK LETTERS.....

DATE.....

Thank you for your help,

Mark Beauchamp, PhD

Justine Wilson, MA

A.7 Debriefing Form – Study 2

Debriefing Form

Loneliness & Physical (In)activity

Thank you for your participation in this study. This study was initially presented to you as an examination of the relationships between loneliness and physical inactivity. **We were specifically interested in whether telling people that engaging in regular exercise is ‘associated with self-regulation and social skills’ or ‘important for health benefits’ has an effect on people’s thoughts about exercise and actual exercise behaviour.**

As a participant in the study, you were randomly placed into one of two conditions. These were: (Condition #1) you were told that exercise is associated with self-regulation and social skills, or (Condition #2) you were told that exercise is important for health benefits. We were looking at the effects of these conditions on your thoughts about exercise and actual exercise behaviour over the last 2 weeks. **We would like to emphasize that engaging in regular exercise is important for all aspects of health (including psychological, social and physical functioning).**

If you feel uncomfortable with the purpose of this study you are free to withdraw your data from this study without incurring any negative consequences.

All the information that you’ve provided in this study will remain confidential. That is, the responses that you provided will not be linked to you, your name, or student number in any manner. If you feel as though you have experienced an undue amount of stress or discomfort as a result of participating in this study you may contact UBC counseling services at 604-822-3811.

Due to the nature of this study, we ask that you refrain from leaving this form in a public area where a potential participant may see it. We also request that you do not tell others about the exercise intentions or behaviour aspects of this study, so that we can continue to complete this investigation.

If you would like any information regarding the results of this study once it has been completed you may contact Dr. Mark Beauchamp or Justine Wilson. If you would like to express a concern about this experiment you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598, or, if you prefer email, at: RSIL@ors.ubc.ca.

A.8 Questionnaire – Study 2

Instructions: The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described by circling the number that corresponds to your answer. **Circle** the answer that applies to you.

	Never	Rarely	Sometimes	Often
1. I lack companionship.	1	2	3	4
2. I have a lot in common with the people around me.	1	2	3	4
3. There are people I feel close to.	1	2	3	4
4. I feel left out.	1	2	3	4
5. No one really knows me well.	1	2	3	4
6. I feel isolated from others.	1	2	3	4
7. There are people who really understand me.	1	2	3	4
8. People are around me but not with me.	1	2	3	4
9. There are people I can talk to.	1	2	3	4
10. There are people I can turn to.	1	2	3	4

A.9 Experimental Materials – Study 1 & 2

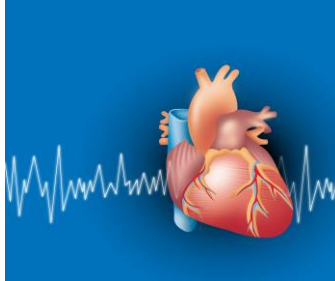
Regular exercise – it's not just about your body, it's about your life!



Attending university is an important time of life. At this time you can develop healthy lifelong behaviours (or habits). Studies have consistently found that people who are disciplined enough to self-regulate their behaviour to engage in a healthy amount of exercise are also disciplined in other important aspects of their lives. For example, if people have the self-control to exercise regularly, it is also very likely that they will have the self-control and characteristics necessary to have satisfying, meaningful and rewarding friendships and relationships. In short, how hard people work to engage in regular exercise has consistently been found to be associated with characteristics that are beneficial for relationships, including empathy and social sensitivity.



Regular exercise – it's about feeling fit and healthy!



Attending university is an important time of life. At this time you can develop healthy lifelong behaviours (or habits). Studies have consistently found that people who exercise regularly have:

- Improved energy
- Lower risk of chronic diseases (e.g., cancer, type 2 diabetes, cardiovascular disease)
- Better weight management



Get Active Your Way, Every Day – Starting Today!

To help you get started with your planning, here is an example plan that was formed by a first-year university student who wanted to include more activity into her lifestyle.



SUNDAY	MONDAY	TUESDAY
Place (P): <i>Pool</i> Time (T): <i>7pm</i> Minutes (M): <i>40</i> Activity (A): <i>swim</i> Cue (C): <i>place goggles on desk in the morning</i>	P: <i>Campus</i> T: <i>12pm</i> M: <i>30</i> A: <i>walk with Rita</i> C: <i>running shoes on top of school bag Sunday evening</i>	P: <i>Gym</i> T: <i>8am</i> M: <i>60</i> A: <i>yoga</i> C: <i>tie yoga mat to school bag Monday evening</i>

Some Strategies to Help You Get Started

Strategy 1: **Form a Weekly Action Plan**

Form a realistic weekly physical activity plan. These plans should be specific and include the day, time and location as well as what you plan on doing – give it a try.

Strategy 2: **Use Action Cues**

A cue refers to a memory trigger for a planned behaviour. For example, placing your running shoes on top of your school bag the night before can act as a reminder for you to bring your shoes for a lunchtime walk/jog.

Strategy 3: **Prepare One Step at a Time**

Focus on getting ready. For instance, instead of thinking about going for a jog and all that's involved, focus on getting your workout clothes and shoes on and getting out the door. The rest will go from there.

Now it's your turn! Keeping in mind the suggested strategies, use the calendar on the next page to plan your physical activity for the next 2 weeks. Remember to use an action cue for each activity.

My exercise plan for the weeks of: _____

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
P:	P:	P:	P:	P:	P:	P:
T:	T:	T:	T:	T:	T:	T:
M:	M:	M:	M:	M:	M:	M:
A:	A:	A:	A:	A:	A:	A:
C:	C:	C:	C:	C:	C:	C:
Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
P:	P:	P:	P:	P:	P:	P:
T:	T:	T:	T:	T:	T:	T:
M:	M:	M:	M:	M:	M:	M:
A:	A:	A:	A:	A:	A:	A:
C:	C:	C:	C:	C:	C:	C:

****Make sure to put this calendar in a place where you can see it (e.g., on your fridge, in course binder).****

Whether you **live in residence or commute** to school, **being physically active doesn't have to be hard**. Here are some examples of how you can include physical activities into your daily routine:

@ HOME...	<ul style="list-style-type: none"> • Establish a morning or evening activity routine (e.g., wake up with a light jog or swim). • Include variety into your routine by alternating the activities you do! • Take a 5-minute stretch break during periods of inactivity (e.g., studying, watching TV).
@ SCHOOL...	<ul style="list-style-type: none"> • Take advantage of fitness consultations at the campus gym and sign-up for physical activity class (e.g., yoga, cycling, dance) – take a friend along and start together. • Take a brisk walk between classes – explore the campus and get to know your classmates better.
ON THE WAY...	<ul style="list-style-type: none"> • Walk across campus and grab your morning coffee from the furthest café. • Walk, blade, board, or cycle to school. • Walk a couple of blocks before you hop on the bus.

Of course these are only a few suggestions that can help guide you along the road to a physically active lifestyle. Remember that a little activation can go a long way...**start paving your pathway today!**

Improves your Energy Levels <ul style="list-style-type: none"> ➤ Helps you focus better in class and while studying ➤ Makes you feel like getting out and doing things 	Reduces your Risk for Chronic Disease <ul style="list-style-type: none"> ➤ Protect yourself from <ul style="list-style-type: none"> - Diabetes - Cardiovascular disease and stroke - Cancer
Helps you Manage your Weight <ul style="list-style-type: none"> ➤ Avoiding “freshman 15” ➤ Looking and feeling fit 	

Appendix B

B.1 *Go Girls!* Program Evaluation Letter of Information & Consent Form – Girls



[Letter to Students] ***Go Girls Program Evaluation Study***

December, 2012

Dear Student,

Purpose of the project: My name is Justine Wilson and I'm a researcher at the University of British Columbia. Along with other researchers at the University of British Columbia in Vancouver and Kelowna, we are conducting research to evaluate the Go Girls program. We are very interested in your attitudes towards physical activity, healthy eating and perceptions of body image.

Participation: If you decide to take part in this study, all we ask of you is to complete a short survey (20 minutes) on four occasions (between December and June 2013). The information you provide in this survey will help us understand what you think about the Go Girls program. If you decide to take part, your answers will be kept private/confidential, and will not be shared with ANYONE else. That means your responses will be combined with those of other students, and so no-one will know how you answered the questions except you. All completed surveys will be kept in a locked cabinet at the University of British Columbia. Your survey will not be made available to anyone other than the researchers involved in this study.

We will also be asking some of the girls to talk to a research assistant about her experiences in the Go Girls program. These interviews will be tape recorded and audio tapes will be stored in a locked and secure storage room at UBC. We will make sure that any recordings (e.g., tape recordings, written records) of our discussions are not heard or read by anyone other than researchers involved with this study. Interviews will be transcribed (typed out) and the information will be used to help us improve the Go Girls program. You can choose to only participate in the questionnaires and not the interview.

Your involvement is voluntary: Please know that your involvement in this study is voluntary. That means, it's up to you if you want to participate or not. If for ANY reason, you do not want to take part in this study that's fine, you don't have to. If you decide to take part, you will also be free to withdraw at any time without having to give any reason. If you drop out you will not experience ANY negative consequences at all. Your decision to participate will in no way impact your marks in school or ability to participate in the Go Girls program. If students decline to participate they will be occupied by an appropriate activity, as decided by the relevant teacher or Go Girls mentor.

Are there any risks? There are no known risks associated with participation in this study.

What are the benefits? Hearing how you think about physical activity, healthy eating and your body image will help us to understand how to improve the Go Girls program. Also, those choosing to participate will be given \$150 (in total for the group) to spend on a reward for the entire group.

Confidentiality and Data Security: Please note that all information that you provide in this study will remain confidential. Your responses will be combined with those of other students and no one will be able to identify you within the study's results, or in any report related to this study. All data that you provide will be made anonymous (i.e., unknown to other people) and will be kept in a locked cabinet in the War Memorial Gym at UBC. All questionnaires be stored for five 5 years after which they will be shredded. All computer files will be stored on a password protected computer in Dr. Beauchamp's locked research laboratory at UBC.

If you have any questions about what is involved please contact Justine Wilson by email or phone. Her contact details are at the end of this letter. Alternatively, if you have any concerns about your rights or treatment as a research subject please contact the 'Research Subject Information Line' in the UBC Office of Research Services at (604) 822-8598 or if long distance email to RSIL@ors.ubc.ca.

Your participation is important to us. Thank you for your help.

The purpose of this form is to make sure that you are happy to take part in the research and that you know what is involved.

By signing this form, you are indicating that you have read and understood the research description provided, are fully aware of what will be asked of you and that you agree to take part in this study. Further, you understand that participation is strictly voluntary and that you are free to end your involvement at any time and that you may choose not to complete the measures without having to give a reason why without experiencing any negative consequences. You understand that all information will be entirely confidential and no individual will be identified at any time.

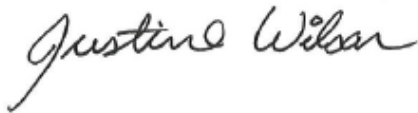
By signing this form you have consented to participate in the Go Girls program evaluation study.

SIGNED.....

NAME IN BLOCK LETTERS.....

DATE.....

Yours sincerely,



A. Justine Wilson, MA (Lead researcher)
School of Kinesiology
University of British Columbia

Mark R. Beauchamp, PhD
School of Kinesiology
University of British Columbia

Mary E. Jung, PhD
School of Health and Exercise Sciences
University of British Columbia at Okanagan

B.2 *Go Girls!* Program Evaluation Letter of Information & Consent Form – Guardians



[Letter to Parents] *Go Girls Program Evaluation Study*

December, 2012

Dear Parent/Guardian,

My name is Justine Wilson and I'm a researcher at the University of British Columbia (UBC). Along with other researchers at UBC in Vancouver and Kelowna, we are currently conducting research to evaluate the Go Girls program. In this research we are examining girls' attitudes towards physical activity, healthy eating and perceptions of body image. This research is funded by the Ontario Ministry of Education. Between December 2012 and May 2013 we will be going in to your daughter's school and we will be inviting Go Girls participants to complete a survey. In this survey we will ask girls a series of questions about their experiences and attitudes towards physical activity and healthy eating as well as perceptions of body image. We will administer the same questionnaires at 3 additional time points. Your daughter will be asked to complete questionnaires 7 weeks before starting the Go Girls program, immediately before starting the program, immediately after completing the program and 7 weeks after completing the program.

On each of these occasions it will take students approximately 20 minutes to complete the questionnaires. None of the questions that we ask are of a delicate or intrusive nature and there are no known risks associated with students' involvement in this study. Student participation is entirely voluntary, and even if students initially choose to take part in this study they may subsequently withdraw at any time without having to give any reason and without experiencing any negative consequences. Your choice to support your daughter's participation in the research will in no way impact her marks in school or ability to participate in the Go Girls program. If students decline to participate they will be occupied by an appropriate activity, as decided by the relevant teacher or Go Girls mentor.

The answers your daughter provides will be combined with those of other students who are taking part in this research and any information students provide will remain completely confidential. All completed questionnaires will be sent by courier and kept in a secured storage facility at the University of British Columbia (War Memorial Gym) and shall not be made available to anyone other than the researchers involved in this study. Each group of Go Girls participants will received \$150 to spend collectively on a desired reward.

If you agree for your child to take part in this research, all we ask you to do is complete this form and return it to your child's school. Also, even if you have consented for your child to take part in this study, we also require her own assent as well before she can be invited to take part. If you have any questions or want further information about the study please contact Justine Wilson. Alternatively, if you have any concerns about your rights or the rights and treatment of your child as a research subject please contact the 'Research Subject Information Line' in the UBC Office of Research Services at (604) 822-8598 or email to RSIL@ors.ubc.ca. They will be more than happy to answer any questions or concerns you might have.

**SO, IF YOU WANT YOUR DAUGHTER TO TAKE PART IN THE GO GIRLS PROGRAM
EVALUATION PLEASE SIGN THIS FORM AND RETURN THIS TO YOUR DAUGHTER'S
SCHOOL**

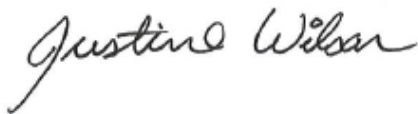
I..... (PARENT'S
NAME)

agree for my daughter(CHILDS NAME) to take

part in the Go Girls program evaluation study.

Signed..... Date.....

Sincerely,



A. Justine Wilson, MA (Lead researcher)
School of Kinesiology
University of British Columbia

Mark R. Beauchamp, PhD
School of Kinesiology
University of British Columbia

Mary E. Jung, PhD
School of Health and Exercise Sciences
University of British Columbia at Okanagan

B.3 *Go Girls!* Program Evaluation Questionnaire

Go Girls Questionnaire

Part A

A1. What is today's date? ____ (Day) ____ (Month) ____ (Year)

A2. First three letters of your FIRST NAME: ____

A3. First three letters of your LAST NAME: ____

A4. Date of birth: ____ (Day) ____ (Month) ____ (Year)

A5. Place of birth: ____ (City) ____ (Country)

A6. What is your age (years): ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ Other: ____

A7. School name: _____

A8. How do you describe yourself in terms of ethnic origin? PLEASE CHECK **ALL** THAT APPLY.

- | | |
|--------------------------------------|--|
| <input type="radio"/> White | <input type="radio"/> South Asian |
| <input type="radio"/> Chinese | (e.g., East Indian, Pakistani, etc.) |
| <input type="radio"/> Black | <input type="radio"/> South East Asian |
| <input type="radio"/> Filipino | (e.g., Vietnamese, Cambodian, etc.) |
| <input type="radio"/> Latin American | <input type="radio"/> West Asian |
| <input type="radio"/> Arab | (e.g., Iranian, Afghan, etc.) |
| <input type="radio"/> Japanese | <input type="radio"/> Korean |
| <input type="radio"/> Russian | <input type="radio"/> Native/Aboriginal |
| <input type="radio"/> African | <input type="radio"/> Other (please specify) _____ |

Part B

In this section of the questionnaire we are interested in finding out **how much time** you spend involved in **physical activity**, as well as your **physical activity intentions**.

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time.

Physical activity can be done in sports, playing with friends, or walking to school.

Some examples are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football, and surfing.

B1. Over the **past 7 days**, on how many days were you **physically active for a total of at least 60 minutes per day**?

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B2. Over a **typical or usual week**, on how many days are you **physically active for a total of at least 60 minutes per day**?

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B3. Outside school hours: How often do you usually do physical activity in your free time, so much that you get out of breath or sweat?

Once a month or less	Once a week	2-3 times per week	4-6 times per week	Every day
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B4. Outside school hours: How many hours do you usually exercise in your free time, so much that you get out of breath or sweat?

None	About half an hour per week	About 1 hour per week	About 2-3 hours per week	About 4-6 hours per week	About 7 hours per week
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B5. I intend to do physical activity at least 3 times over the next week.

Very unlikely	Unlikely	Somewhat unlikely	Neutral	Somewhat likely	Likely	Very likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B6. I plan to do physical activity at least 3 times over the next week.

Very unlikely Unlikely Somewhat unlikely Neutral Somewhat likely Likely Very likely

☐ ☐ ☐ ☐ ☐ ☐ ☐

B7. I am determined to do physical activity at least 3 times over the next week.

Very unlikely Unlikely Somewhat unlikely Neutral Somewhat likely Likely Very likely

☐ ☐ ☐ ☐ ☐ ☐ ☐

Part C

	True	False	Other
C1. If I am having lunch away from home, I often choose a low-fat option.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never have lunch away from home
C2. I usually avoid eating fried foods.	<input type="radio"/>	<input type="radio"/>	
C3. I usually eat a dessert if there is one available.	<input type="radio"/>	<input type="radio"/>	
C4. I eat <u>at least one</u> serving of fruit a day.	<input type="radio"/>	<input type="radio"/>	
C5. I try to keep my overall fat intake down.	<input type="radio"/>	<input type="radio"/>	
C6. If I am buying chips, I often choose a low-fat brand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never buy chips
C7. I avoid eating lots of hot dogs and burgers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never eat hot dogs or burgers
C8. I often buy donuts, cupcakes or cookies.	<input type="radio"/>	<input type="radio"/>	
C9. I try to keep my overall sugar intake down.	<input type="radio"/>	<input type="radio"/>	
C10. I eat at least one serving of vegetables or salad a day.	<input type="radio"/>	<input type="radio"/>	
C11. If I am having a dessert at home, I try to have something low in fat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I don't eat desserts
C12. I rarely eat fast-food meals.	<input type="radio"/>	<input type="radio"/>	
C14. I eat plenty of fruit and vegetables.	<input type="radio"/>	<input type="radio"/>	
C15. I often eat sweet snacks between meals.	<input type="radio"/>	<input type="radio"/>	

	True	False	Other
C16. I usually eat at least one serving of vegetables (excluding potatoes) or salad with my evening meal.	<input type="radio"/>	<input type="radio"/>	
C17. When I am buying a pop, I usually choose a diet pop.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never buy pops
C18. When I put butter or margarine on bread, I usually spread it thinly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never have butter or margarine on bread
C19. If I have a packed lunch, I usually include some chocolate and/or treats.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never have a packed lunch
C20. When I have a snack between meals, I often choose fruit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never eat snacks between meals
C21. If I am having a dessert in a restaurant, I usually choose the healthiest one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I never have desserts in restaurants
C22. I often have ice cream with desserts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> I don't eat desserts
C23. I eat at least three servings of fruit most days.	<input type="radio"/>	<input type="radio"/>	
C24. I generally try to have a healthy diet.	<input type="radio"/>	<input type="radio"/>	

C25. I **intend** to eat a healthy diet every day during the next week.

Very unlikely	Unlikely	Somewhat unlikely	Neutral	Somewhat likely	Likely	Very likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

C26. I **plan** to eat a healthy diet every day during the next week.

Very unlikely	Unlikely	Somewhat unlikely	Neutral	Somewhat likely	Likely	Very likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

C27. I **am determined** to eat a healthy diet every day during the next week.

Very unlikely	Unlikely	Somewhat unlikely	Neutral	Somewhat likely	Likely	Very likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Mildly disagree	Mildly agree	Agree	Strongly agree
D1. I feel comfortable in the presence of strangers.	①	②	③	④	⑤	⑥
D2. I am in tune with the world.	①	②	③	④	⑤	⑥
D3. Even among my friends, there is no sense of brother/sisterhood.	①	②	③	④	⑤	⑥
D4. I fit in well in new situations.	①	②	③	④	⑤	⑥
D5. I feel close to people.	①	②	③	④	⑤	⑥
D6. I feel disconnected from the world around me.	①	②	③	④	⑤	⑥
D7. Even around people I know, I don't feel that I really belong.	①	②	③	④	⑤	⑥
D8. I see people as friendly and approachable	①	②	③	④	⑤	⑥
D9. I feel like an outsider.	①	②	③	④	⑤	⑥
D10. I feel understood by the people I know.	①	②	③	④	⑤	⑥
D11. I feel distant from people.	①	②	③	④	⑤	⑥
D12. I am able to relate to my peers.	①	②	③	④	⑤	⑥
D13. I have little sense of togetherness with my peers.	①	②	③	④	⑤	⑥
D14. I find myself actively involved in people's lives.	①	②	③	④	⑤	⑥
D15. I catch myself losing a sense of connectedness with society.	①	②	③	④	⑤	⑥
D16. I am able to connect with other people.	①	②	③	④	⑤	⑥
D17. I see myself as a loner.	①	②	③	④	⑤	⑥
D18. I don't feel related to most people.	①	②	③	④	⑤	⑥
D19. My friends feel like family	①	②	③	④	⑤	⑥
D20. I don't feel I participate with anyone or any group.	①	②	③	④	⑤	⑥

	NO!	no	yes	YES!
D21. I feel comfortable in the Go Girls program.	①	②	③	④
D22. I am a part of the Go Girls program.	①	②	③	④
D23. I am committed to the Go Girls program.	①	②	③	④
D24. I am supported at the Go Girls program.	①	②	③	④
D25. I am accepted at the Go Girls program.	①	②	③	④

Part E

The following statements focus on **physical activity done in your leisure time (outside of school)**. There are no right or wrong answers to any of these questions, and we would simply like you to **rate your confidence in your ability at this moment in time** using the following scale.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at All Confident					Somewhat Confident					Completely Confident

If you really wanted to, how confident are you that you can...

E1. Be physically active even if you feel tired *over the next week*.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E2. Be physically active even if you are in a bad mood *over the next week*.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E3. Be physically active even if you don't have the time *over the next week*.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E4. Arrange your schedule to be physically active no matter what *over the next week*.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E5. Overcome obstacles that prevent you from being physically active regularly *over the next week*.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E6. Make up times when you have missed your regular physical activity *over the next week*.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The following statements focus on **eating behaviours**. There are no right or wrong answers to any of these questions, and we would simply like you to **rate your confidence in your ability at this moment in time** using the following scale.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at All Confident					Somewhat Confident					Completely Confident

E7. How confident are you in your ability to bring a healthy lunch with you to school over the *next week*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E8. How confident are you in your ability to eat healthily even if you are being overwhelmed by the demands of school over the *next week*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E9. How confident are you that if you are preparing a meal or snack, it would be a healthy option over the *next week*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E10. How confident are you in your ability to not let your schedule get in the way of your plans to eat healthy over the *next week*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

E11. How confident are you that if you are going to eat out, you will choose healthy meals over the *next week*?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

For me, <u>regular physical activity</u> over the <u>next week</u> would be:							
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F1.	Extremely Useful						Extremely Useless
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F2.	Extremely Wise						Extremely Foolish
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F3.	Extremely Beneficial						Extremely Harmful
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F4.	Extremely Enjoyable						Extremely Unenjoyable
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F5.	Extremely Pleasant						Extremely Unpleasant
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F6.	Extremely Interesting						Extremely Boring

For me, **eating a healthy diet** over the **next week** would be:

F7.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Useful	Extremely Useless
F8.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Wise	Extremely Foolish
F9.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Beneficial	Extremely Harmful
F10.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Enjoyable	Extremely Unenjoyable
F11.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Pleasant	Extremely Unpleasant
F12.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Interesting	Extremely Boring

Part G

	Completely Disagree		Neither Agree nor Disagree		Completely Agree
G1. Women who appear in TV shows and movies project the type of appearance that I see as my goal.	①	②	③	④	⑤
G2. I believe that clothes look better on thin models.	①	②	③	④	⑤
G3. Music videos that show thin women make me wish that I were thin.	①	②	③	④	⑤
G4. I <u>do not</u> wish to look like the models in the magazines.	①	②	③	④	⑤
G5. I tend to compare my body to the people in magazines and on TV.	①	②	③	④	⑤
G6. In our society, fat people <u>are not</u> regarded as unattractive.	①	②	③	④	⑤
G7. Photographs of thin women make me wish that I were thin.	①	②	③	④	⑤
G8. Attractiveness is very important if you want to get ahead in our culture.	①	②	③	④	⑤
G9. It's important for people to work hard on their figures/physiques if they want to succeed in today's culture.	①	②	③	④	⑤
G10. Most people <u>do not</u> believe that the thinner you are, the better you look.	①	②	③	④	⑤
G11. People think that the thinner you are, the better you look in clothes.	①	②	③	④	⑤
G12. In today's society, <u>it's not</u> important to always look attractive.	①	②	③	④	⑤
G13. I wish I looked like a swimsuit model.	①	②	③	④	⑤
G14. I often read magazines like <i>YM</i> , <i>Teen Vogue</i> , and <i>Girls' Life</i> and compare my appearance to the models.	①	②	③	④	⑤

Part H

	Not at all	A little	Some	A lot	Very much
H1. I am confident that I am good at making friends.	①	②	③	④	⑤
H2. I am confident that I can help other people.	①	②	③	④	⑤
H3. I am confident that I can ask others if I can be of help.	①	②	③	④	⑤
H4. I am confident that I can do nice things for people.	①	②	③	④	⑤

Part I

In this section, we would like you to describe the teaching style of your Go Girls! Mentor. To answer each question, please circle the number that best describes what you think. If a question is irrelevant, or if you are unsure or do not know the answer, leave the answer blank. Please be as honest as possible, and answer how frequently each statement fits the teacher you are describing.

Please think about your Mentor during the Go Girls! sessions.

THE MENTOR I AM RATING...

	Not at all	Once in a while	Sometimes	Fairly often	Frequently
I1. Shows that she cares about me.	0	1	2	3	4
I2. Acts as a person that I look up to.	0	1	2	3	4
I3. Creates lessons that really encourage me to think.	0	1	2	3	4
I4. Demonstrates that she believes in me.	0	1	2	3	4
I5. Treats me in ways that build my respect.	0	1	2	3	4
I6. Is enthusiastic about what I am capable of achieving.	0	1	2	3	4
I7. Provides me with tasks and challenges that get me to think in different ways.	0	1	2	3	4
I8. Motivates me to try my hardest.	0	1	2	3	4
I9. Tries to know every girl in the group.	0	1	2	3	4
I10. Gets me to question my own and others' ideas.	0	1	2	3	4
I11. Tries to help girls who might be struggling.	0	1	2	3	4
I12. Talks about her personal values.	0	1	2	3	4
I13. Encourages me to look at issues from different sides.	0	1	2	3	4
I14. Recognizes the needs and abilities of each student in the class.	0	1	2	3	4
I15. Is optimistic about what I can accomplish.	0	1	2	3	4
I16. Behaves as someone that I can trust.	0	1	2	3	4

Part J

Please answer the following questions regarding your Go Girls group. Fill in the circle for the number that best represents your answer.

	Strongly disagree	Disagree	Mildly disagree	Mildly agree	Agree	Strongly agree
J1. Members of my Go Girls group would approve if I did regular physical activity.	①	②	③	④	⑤	⑥
J2. Members of my Go Girls group think I should do regular physical activity.	①	②	③	④	⑤	⑥
J3. Members of my Go Girls group do regular physical activity.	①	②	③	④	⑤	⑥
J4. Members of my Go Girls would approve if I ate healthily.	①	②	③	④	⑤	⑥
J5. Members of my Go Girls think I should eat healthily.	①	②	③	④	⑤	⑥
J6. Members of my Go Girls are healthy eaters.	①	②	③	④	⑤	⑥

B.4 *Go Girls!* Program Evaluation Interview Guide

Interviews

Procedure

1. Give girls' letter of information and consent form.
2. Ensure participant knows participation is completely voluntary and they do not have to answer any question they do not want to. They can also choose to have their audio file deleted after if they do not want it included in the study.
3. Ask demographic questions (please print this for each person as well).
4. Conduct the interview.
5. Thank participant for their time and give reimbursement.

Demographic Questions

1. Date _____
2. Participant ID _____
3. Age _____
4. How do you describe yourself in terms of ethnic origin? PLEASE CIRCLE **ALL** THAT APPLY.

White

Native/Aboriginal

South Asian (e.g., East Indian, Pakistani, Sri Lankan)

Chinese

Black

Filipino

Latin American

Arab

Southeast Asian (e.g., Vietnamese, Cambodian)

West Asian (e.g., Iranian, Afghan)

Korean

Japanese

Russian

African

Other (please specify) _____

Prompts

A few of the questions ask about more than one idea. You may have to rephrase and ask the questions a second time to get the participant to comment on a facet that they didn't cover in their previous answer.

If you have a participant who is not talkative/giving 1-word answers, please use prompts to try to get more detailed information. For example, if the girl says she liked all of the *Go Girls!* activities, you could ask her which one was her favorite? Why did she like it so much? Avoid giving examples/leading the participant and stick to open ended questions to reduce any chances of bias. Here are a few ideas for prompts you can use if you are having trouble getting detailed answers from the participant during the interview:

- Can you tell me a bit more about _____?
- How did _____ make you feel?
- Can you tell me what you mean by _____?
- Is there anything particular about _____ that you did/did not like/enjoy?
- Why did/did you not enjoy _____?

Remember that silence is ok! Give the participant time to think about the question. You can ask the participant if you can clarify/explain anything if they seem to be struggling. Be flexible!

Interview Questions

1. Tell me about your experience in the Go Girls! program.
2. Could you describe your relationship with your mentor in the Go Girls! program?
3. Could you describe your relationship with the other girls in the Go Girls! program?
4. Is there anything that you do differently now that you've been through the Go Girls! program?
5. To what extent do you feel differently about yourself now that you've been through the Go Girls! program?
6. Could you describe any changes in the way that you think since you finished the Go Girls! program?
7. Have you shared anything that you learned in the Go Girls! program with friends or family?
8. What did you like about the Go Girls! program?
9. Do you think there is anything that could be improved with the program?
10. Any other comments or suggestions you would like to add?

Appendix C

C.1 *Go Girls!* Program Evaluation Report - Supplementary Material

Attendance, Dose and Fidelity

Girls attended on average 91% of the 7 sessions (range 2-7 sessions attended; see Figure 1). Sessions were on average 78 minutes long (range 40-135 minutes; see Figure 2) and total program minutes were on average 534 minutes (range 280-910 minutes; see Figure 3). Mentors reported session fidelity using a scale from 1 (*did not complete any of the planned activities*) to 10 (*completed all of the planned activities*). Across all 7 sessions, average program fidelity was 7.04 (range 3.5-9.29; see Figure 4). However, this is based on a subset of the data and it is possible that the groups that failed to provide these data had lower (or better) attendance rates, shorter sessions (hence no time to complete this form) and/or less conscientious mentors.

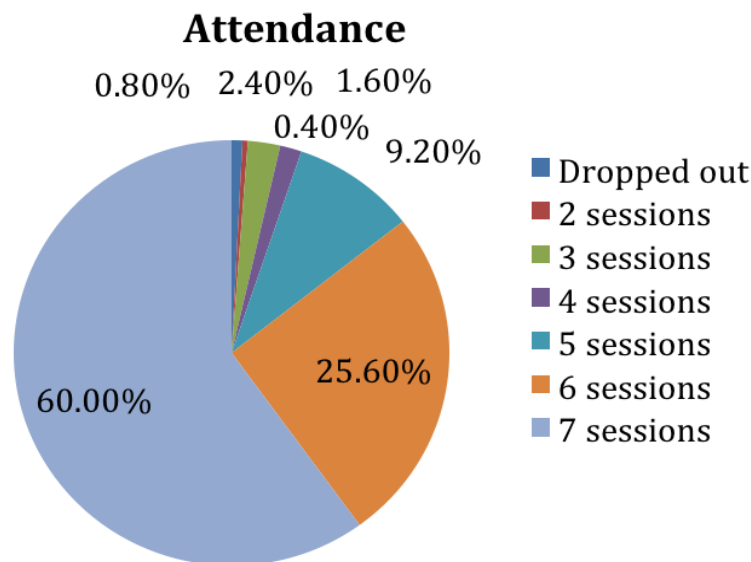


Figure 1. This chart represents the number of *Go Girls!* program sessions attended separated by percentage of girls who attended the sessions. For example, 60% of the girls attended all 7 sessions and 25.6% of the girls attended 6 out of 7 sessions.

Average Session Duration

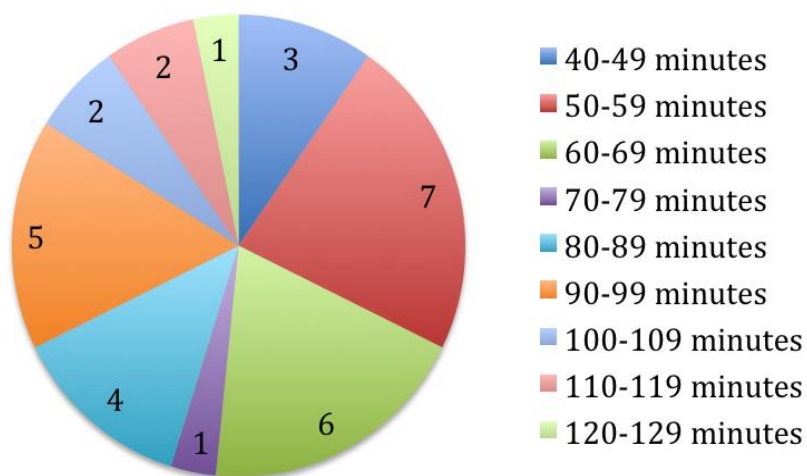


Figure 2. This chart represents the average session duration separated by the number of *Go Girls!* program groups. For example, 3 of the groups' sessions were on average 40-49 minutes long.

Total Program Minutes

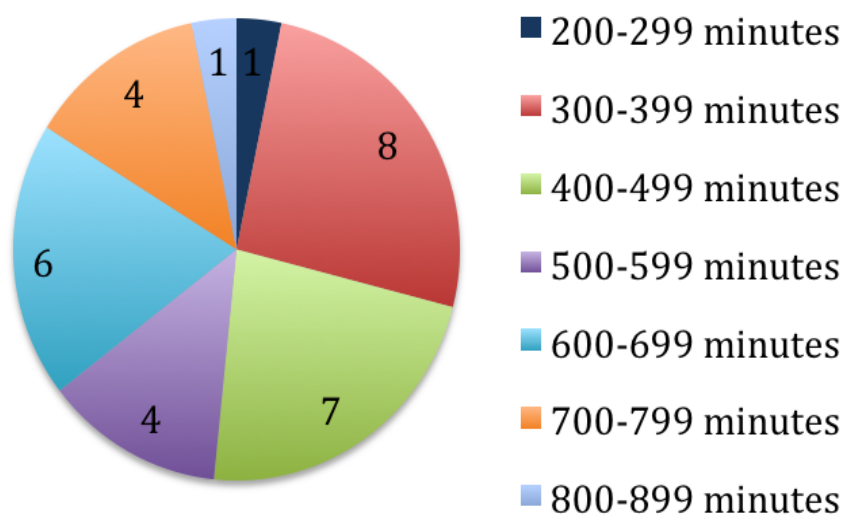


Figure 3. This chart represents the total *Go Girls!* program duration separated by the number of *Go Girls!* program groups. For example, 1 of the group's sessions was 200-299 minutes long.

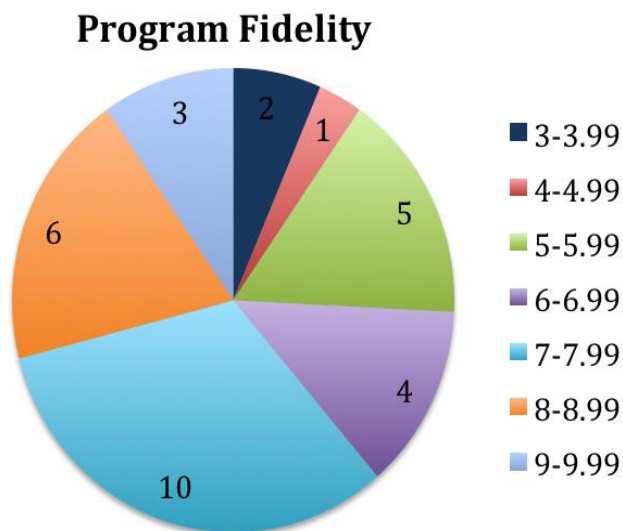


Figure 4. This chart represents the average *Go Girls!* session fidelity ratings from the program mentors separated by the number of groups. For example, 2 of the groups' leaders felt the session content covered 3-3.99 on the scale for fidelity (1 = *did not complete any planned activities* --- 10 = *completed all planned activities*).

Recommendations

In line with the *Go Girls!* program mandate, findings from the outcome evaluation suggest the *Go Girls!* program is effective as girls who completed the program reported sustained elevated levels of physical activity 7 weeks after program completion. Furthermore, girls reported improvements in important cognitions as well (e.g., self-regulatory efficacy, behavioural intentions). **Thus, the overall activities involved in the *Go Girls!* program are effective in targeting adolescent girls' health-enhancing cognitions and behaviours.** However, as outlined in the previous section, several areas of the program could be improved. Recommendations to address these areas are provided below.

Recommendation 1: Consider Making the Program Longer

- ❖ The main concern identified by the majority of the mentors was a lack of time to run the program. Indeed, the *Go Girls!* program is designed to consist of seven 90-minute sessions (i.e., 630 minutes total), but mentors are encouraged to secure 2 hours for each session to ensure adequate time to deliver program. Findings from this program evaluation indicated that on average, program sessions were 78 minutes long and overall time in the session was approximately 534 minutes. Mentors reported that on average they completed 7.03 (on a scale of 1 = did not complete any planned activities – 10 = completed all planned activities from manual) of the sessions as they were designed. It is noted that during the current program evaluation, the teachers were on work to rule in all of the school districts in Ontario, so finding time during school for the girls to participate in the program was a challenge.
- ❖ *From a program effectiveness perspective*, the shortened version of the program (i.e., less than 90 minute sessions) still led to changes in health-enhancing cognitions and behaviours (which were maintained 7 weeks post program completion). **Thus, it is not imperative to increase the duration of *Go Girls!* (i.e., number or duration of sessions) to ensure minimal program effectiveness.** Future research could explore whether or not a longer program leads to greater changes in the girls'

cognitions and behaviours (cf. DuBois, Portillo, Rhodes, Silverthron, & Valentine, 2011; J. E. Rhodes, 2008).

- ❖ While the results of the outcome evaluation indicated the program led to changes in participants' health-enhancing thoughts and behaviours, results from the process evaluation revealed that both the girls and the mentors wished the program was longer. Thus, *from the girls' and the mentors' enjoyment perspective, it is recommended to increase or at least find time for delivering the program the way it was designed (i.e., in seven 90-120 minute sessions) for participant and mentor enjoyment.* If this is not possible, consider helping mentors focus on the most important sections of the program so they do not feel rushed to cover the entire program content.

Recommendation 2: Ensure Schools are Ready, Willing and Able to Deliver *Go Girls!*

- ❖ Although three of the mentors noted that a positive component of the program was the support they received from the school champions (see Appendix D, Table 4.3), not all mentors felt this way. Three mentors identified a need for more support from program champions and one mentor specifically discussed the need for more support from a confidential contact at Big Brothers Big Sisters. When mentors are trained, it is important that they are made aware of supportive resources available to them (i.e., contacts within the school and/or Big Brothers Big Sisters).
- ❖ Member agencies of Big Brothers Big Sisters should ensure a mentor facilitator is available to talk to, in confidence, if mentors are experiencing concerns during the program and are unable to get assistance from school champions.
- ❖ Before agreeing to offer the *Go Girls!* program at interested schools, member agencies of Big Brothers Big Sisters should **ensure that schools are ready, willing and able to provide the necessary resources to deliver this program effectively** (e.g., supportive school champions, set aside appropriate room(s), able to offer for at least the minimum time the program was design for, and provide equipment for activities as necessary). **Development of a readiness checklist could aid in determination of school readiness.**

Recommendation 3: Consider Providing Age Appropriate Adaptations for Activities

- ❖ Three of the eight mentors felt that some of the activities were too juvenile for the older program participants. Consider adding age appropriate adaptations for activities in the program manual or going over such adaptations in mentor training.

Recommendation 4: Ensure Girls Understand that they Can Share Lessons Learned in the *Go Girls!* Program

- ❖ Several of the girls reported in the interviews that they did share lessons learned with their family or friends, in a manner that appeared to respect the confidentiality of the other participants (e.g., “I’ve shared with them like the healthy facts, like how to eat properly”). However, two of the twelve girls interviewed mentioned that they had not shared the lessons learned in *Go Girls!* because they felt everything was to be kept strictly confidential.
- ❖ While it is very important for the girls to respect the confidential nature of the discussions in the program, it would be beneficial for the mentors to also give examples and teach the girls how they can share the tenets of the *Go Girls!* program. For example, the mentors could explain how the specific examples discussed in *Go Girls!* sessions should be kept private, the girls can share the overall lessons learned in the *Go Girls!* program (such as sharing healthy facts, how to be physically active, or relationship skills). **Given the numerous examples of personal growth reported by the participants in the interviews (e.g., improved confidence, self-worth, body image, relationships skills, communication skills, etc.), it is important for the girls to feel they can share these valuable lessons learned with others.** As the girls teach others (i.e., friends and family members) what they have learned, it reinforces using these valuable skills in their own lives.

Recommendation 5: Update Program Manual to Provide Mentors with Evidence-Based Nutrition Information

- ❖ We identified several instances throughout the program manual where nutrition recommendations could be updated based on the current scientific evidence.

- ❖ For example, research suggests that consuming breakfast is associated with better cognitive function, school attendance, overall health and well-being (Rampersaud, Pereira, Girard, Adams, & Metzl, 2005). In line with this research, a lesson on the importance of consuming breakfast and thinking of healthy quick options is provided on page 122 of the program manual. However, the “Tip of the Day” is to make time for breakfast, to consider all four food groups, and then goes on to suggest that girls just grab a juice box and piece of pizza for breakfast. Consuming a healthy breakfast is a very important lesson, however giving the girls the option to choose a high sugar (juice) and processed foods (pizza) gives the girls an easy excuse to eat unhealthy foods and is inconsistent with the *Go Girls!* program mandate (i.e., to teach girls about balanced healthy eating).
- ❖ The evidence suggests that adolescent girls should be encouraged to increase their intake of fruits and vegetables and balance this with healthy sources of protein and fat. Specifically, fruits and vegetables are full of important nutrients for growing adolescents (Moore, Singer, Qureshi, Bradlee, & Daniels, 2012; Prentice et al., 2006), healthy sources of protein are important for muscle growth (Tipton & Wolfe, 2001) and healthy sources of fats are important for obtaining fatty acids essential for growth and development (Huffman, Harika, Eilander, & Osendarp, 2011). Furthermore, increasing healthy consumption of these foods during adolescence increases the chances these healthy eating behaviours will continue on to adulthood (Larson, Fulkerson, Story, & Neumark-Sztainer, 2013; Lien, Lytle, & Klepp, 2001).
- ❖ If the girls indicate they are having trouble planning breakfast, this could also be an excellent learning opportunity to teach the girls to think ahead and pre-make a healthy breakfast the night before. Girls’ self-regulatory efficacy for healthy eating was not sustained 7 weeks after completing the program and instrumental attitudes towards healthy eating became worse. Incorporating more opportunities in *Go Girls!* that could help the girls learn to self-regulate their eating and understand the health benefits of healthy eating would be beneficial.
- ❖ **Rather than encouraging girls to grab something convenient but unhealthy to eat, program mentors should set high standards for the girls to aspire towards (which would be consistent with the *Go Girls!* program mandate). Thus, it is**

recommended that the program manual is updated based on current scientific evidence regarding nutrition guidelines.

Recommendation 6: Ensure Mentors Provide Healthy Snacks

- ❖ During the interviews, one mentor identified bringing unhealthy snacks (large amounts of cupcakes) and one of the girls reported being given unhealthy snacks as well (cinnamon spread). While it is important to teach girls about moderation, it is essential to also teach mentors about healthy snack choices and being creative about teaching girls to incorporate healthy food into their lives. Thus, **given that one purpose of the *Go Girls!* program is to promote healthy eating, it is important the mentors are (a) educated about healthy eating to provide evidence based information for the girls and (b) required to bring in creative healthy snacks so the girls learn to try and like new and healthy foods.**
- ❖ The manual could be updated to encourage the mentors to be creative when thinking about healthy snacks. For example, numerous websites exist that give many creative ideas for healthy snacks and fun and creative ways to present them to youth. Research suggests that healthy foods presented in creative ways (i.e., vegetables with super powers for younger kids; Agrawal, 2012) and simply encouraging adolescents to taste and try new foods helps to broaden their food choices (Birch, 1999; Hendrie, Brindal, Baird, & Gardner, 2013). Given that the girls reported significant decreases in instrumental attitudes toward healthy eating, focusing on improving this component of *Go Girls!* is an important next step in program improvement.
- ❖ Fun food choices could be obtained from creative websites including Pinterest (www.pinterest.com) and girls could be encouraged to try snacks based on whole foods such as kale chips or cauliflower popcorn (i.e., creative ways to eat vegetables).
- ❖ Finally, food should not be used as a reward (i.e., contrary to instructions from the program evaluators and Toronto program directors, girls were given money to spend at fast food venues for their participation in this study). This promotes unhealthy psychological relationships with food and increases the girls' preferences

for the food used as a reward (Birch, 1999). *Go Girls!* can be used as a platform to encourage development of lifelong healthy eating.

Recommendation 7: Update Program Manual to Provide Mentors with Evidence-Based Physical Activity Information

- ❖ Current evidence-based physical activity guidelines suggest that to attain health benefits, Canadian youth should engage in *at least* 60 minutes of moderate-vigorous intensity physical activity per day (Tremblay, Warburton, et al., 2011). Note that 60 minutes of physical activity can be accumulated over the course of the day.
- ❖ Furthermore, reducing screen time is also important for health benefits and it is recommended that youth limit recreational screen time to no more than 2 hours per day (Tremblay, Leblanc, et al., 2011).
- ❖ While the instructions in the manual suggest mentors do their best to help girls like to be active and think about becoming more active, the manual suggests that simply doing 10 minutes of dancing is sufficient physical activity. Indeed, any activity is better than none, however, similar to the nutrition recommendations, it is suggested that the *Go Girls!* program set high standards to which the girls strive to achieve.
- ❖ Simple updating the wording/tip of the day and information taught to mentors can raise this standard to help all girls strive toward attaining health benefits from regular moderate-vigorous intensity physical activity.

Recommendation 8: Further Scientific Exploration of:

Beyond these recommendations, a number of unanswered questions exist that are worthy of future research and future consideration by *Go Girls!* program directors. These include:

- ❖ Effective strategies to target affective and instrumental attitudes among adolescent girls
- ❖ Age appropriate program activity adaptations
- ❖ Development of school readiness checklist
- ❖ What is the optimal dosage (i.e., amount of contact time) of the *Go Girls!* program
- ❖ Evaluation of mentor training program