Effects of Social Belonging and Task Framing on Exercise Cognitions and Behavior

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The objective of the studies presented in this paper was to examine whether the need to belong can be used to enhance exercise cognitions and behavior. Two studies examined the effectiveness of framing exercise as a means of boosting social skills (versus health benefits) for self-regulatory efficacy, exercise intentions, and (in Study 2) exercise behavior. In Study 1, inactive adults primed to feel a lack of social belonging revealed that this manipulation led to greater self-regulatory efficacy (but not exercise intentions). In Study 2, involving a sample of inactive lonely adults, 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. These findings provide an important basis for developing physical activity interventions that might be particularly relevant for people at risk for feeling socially isolated or lonely.

Keywords: loneliness, social rejection, health promotion, self-regulatory efficacy, exercise intentions

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; Canadian Fitness and Lifestyle Research Institute, 2007). In light of the pervasiveness of physical inactivity, as well as the myriad health consequences associated with such behavior, there have been growing calls for innovative theory-driven strategies to support the adoption and sustenance of active lifestyles across the age span (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 for negative health outcomes (e.g., Hawkley & 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 & Hawkley, 2009; Shankar, McMunn, Banks, & Steptoe, 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 behavior among lonely individuals is pressing.

Consistent with several prominent social cognitive theories (e.g., belongingness theory [Baumeister & Leary, 1995], social identity theory [Tajfel & Turner, 1986], optimal distinctiveness theory [Brewer, 1991]), the need to belong is a salient driver of human emotions, cognitions, and behaviors (Baumeister & Leary, 1995). Indeed, belongingness theory represents a promising framework to support the development of self-regulatory behaviors (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; Axelrod & Hamilton, 1981; Bowlby, 1969). When the need to belong is satiated, individuals are more likely to engage in adaptive behaviors (e.g., prosocial behaviors; Parkhurst & Asher, 1992; Schonert-Reichl, 1999; Twenge et al., 2007) and feel more motivated in general (Walton, Cohen, Cwir, & Spencer, 2012). In contrast,
when this need is thwarted, individuals often engage in maladaptive behaviors (e.g., aggression, unhealthy food choices; Baumeister, DeWall, Ciarocco, & Twenge, 2005; Twenge, Baumeister, Tice, & Stucke, 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, Baumeister, & Vohs, 2008). For example, compared with 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 phenomena has been demonstrated in previous studies that have found that when performance on a self-regulatory task is framed as predictive of social skills, socially rejected individuals perform better when compared with 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 behavior (Anderson, Winett, & Wojcik, 2007). Thus, it is possible that framing self-regulation of exercise behavior 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 behavior. 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 fulfill the need to belong could be used to motivate this at risk population to engage in regular exercise.

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 behavior—intentions and self-regulatory efficacy. Intentions, which are incorporated in a range of theories of behavior change (e.g., theory of planned behavior, Ajzen, 1985; social cognitive theory, Bandura, 1986), represent a summary measure of motivation and an individual's willingness to put forth effort into a given behavior (Ajzen, 1985). Thus, if an individual is motivated to engage in a given behavior, he or she will likely report higher intentions to perform that behavior. 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 behavior (Anderson, Winett, & Wojcik, 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 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 behavior, 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) and 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 behavior (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

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 min on 2 or fewer days of the week¹; $M_{\text{exercise,min}} = 27.47 \text{ min/week, } SD_{\text{exercise,min}} = 28.94$) and were between 18 and 29 years of age.² This study consisted of 114 university students ($M_{\text{age}} = 20.33, SD_{\text{age}} = 2.62; 86.50\%$ 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 × exercise benefits on social cognitions, the following parameters were entered: effect size ($f = 0.30, \alpha = .05, \text{ power } = .80$. 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 (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 min 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 Leisure-Time Exercise Questionnaire 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 behavior (e.g., overcome barriers to exercise and plan for regular exercise) over the upcoming 2 weeks was assessed using a 10-item measure developed by Shields and Brawley (2006). Items are measured using a standard 0% (not at all confident) to 100% (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 ($\alpha \geq .88$; Shields & Brawley, 2006). In the current 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 three-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 behavioral 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 physical activity. 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 min 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 min 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 $\alpha \geq .75$).

Procedure

Before 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 laboratory to complete the rest of the study.

Participants completed the study individually. When each participant arrived for the laboratory 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 acceptance social skills) and future health benefits; future rejection health benefits; future rejection social skills; 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). 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 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 behavior. 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
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 ($M_{change}$ = 8.82, $SD = 15.40, t(103) = 5.84, p < .001, $d = 0.45$; however no significant changes in exercise intentions were found, ($M_{change} = 0.01, SD = 0.83, t(103) = 0.07, p = .94, d = 0.00$. 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) × 2 (task framing: health vs. social skills) ANOVAs 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 with 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 1 (top panel) displays these findings.

**Exercise Intentions**

A 2 (belonging: social rejection vs. social acceptance) × 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 1; bottom panel) suggested the difference in the standardized means was in the hypothesized direction between

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**Figure 1** —Top: Mean change scores for self-regulatory efficacy (SRE) for each condition in Study 1. Bottom: Mean change scores for intentions for each condition in Study 1. Error bars represent standard error.
the future rejection social skills ($M_{social\ skills} = 0.27, SD = 0.85$) and the future rejection health benefits ($M_{health} = -0.81, SD = 0.61$) conditions.

Discussion

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 behavior when exercise was presented as indicative of social skills in comparison with 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 with 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 with socially rejected people, accepted people do not appear to be more motivated (nor, in the current study, more confident) to engage in a behavior 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 behavioral changes when compared with affective judgments (Gellert, Ziegelmann, & Schwarzer, 2012; Lowe, Eves, & Carroll, 2002; Rhodes, Fiala, & Conner, 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 behavior 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 behavior. 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 behavior of lonely individuals (de Jong Gierveld, van Tilburg, & Dykstra, 2006).

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 with when health benefits are emphasized. Given that self-regulatory efficacy is an important predictor of exercise behavior (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 behavior. 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 with when exercise was framed as important for health benefits. It was hypothesized that compared with 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 behavior). 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 with those in the health benefits condition. Considering the prospective nature of Study 2, we also examined 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 with those in the health benefits condition.

Method

Participants

Individuals were eligible to participate in this study if they were inactive (i.e., engaged in moderate-vigorous intensity exercise on 2 or fewer 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 Scale4). Eighty-four inactive lonely university students (M_{age} = 21.96 years, SD_{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

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 behavior) the following parameters were entered: effect size (d) = 0.55, $\alpha = .05$, 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 Leisure-Time Exercise Questionnaire 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 $\alpha \geq .72$).

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 item 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

Before 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 laboratory to complete the next part of the study.

When participants arrived for the laboratory 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 partici-
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 2 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 behavior, 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 behavior 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 behavior, self-regulatory efficacy, belonging, and loneliness).

![Figure 2](image-url) - Top: Mean scores for exercise (minutes per week) and self-regulatory efficacy (SRE) at Baseline and Time 2 for all participants in Study 2. Bottom: Mean scores for loneliness and belonging among all participants at Baseline and Time 2 in Study 2. Error bars represent standard error.
Results

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, $t(\geq 4.03, ps < .001, d(\geq 0.65$, when compared with baseline measures (see Figure 2). Consistent with our hypothesis, compared with participants in the health benefits condition, 2 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 with 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, $t(\leq 1.26, ps \geq .21$. These findings are displayed in Figure 3.

Discussion

The purpose of Study 2 was to test the effectiveness of framing exercise as beneficial for social skills (vs. beneficial for health), and whether this would lead to increases in exercise behavior and improved social cognitions for dispositionally lonely inactive individuals. Both conditions led to significant improvements in exercise behavior, self-regulatory efficacy, sense of belonging, and loneliness compared with baseline. In terms of relevant health promotion outcomes, compared with the standard care health benefits comparison condition, the social skills condition produced comparable positive behavioral and psychological outcomes. Thus, framing self-regulation to exercise as indicative of social skills boosted physical activity behavior, and this intervention was at least as effective as a standard care (e.g., highlighting the health benefits) instruction. Furthermore, compared with those in the health benefits condition, participants in the social skills condition reported additional benefits of greater increases in sense of belonging 2 weeks after the brief intervention. Given the high prevalence of inactivity (Bauman et al., 2009; Canadian Fitness and Lifestyle Research Institute, 2007), 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 behavior 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 behavior (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 behavior that were directly comparable with changes found in a standard care health promotion intervention. In addition, compared with 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 for 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 behavior (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 behavior). 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 behavioral 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 behavior, 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 behavior 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 behavior and self-efficacy (for review, see Belanger-Gravel et al., 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 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 3, left panel; $M_{social\ skills} = 90.53$ min/week; $M_{health\ benefits} = 76.89$ min/week). Future work is warranted to examine whether a refined social skills intervention not only results in significant improvements in belonging but also exercise behavior.

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 behavior and cognitions, specifically regarding health-enhancing exercise behavior. Third, to the best of our knowledge this is the first study to specifically target increasing physical activity cognitions (and behavior—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 physical activity behaviors, 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.

Notes

1. The current (Canadian) guidelines (Tremblay et al., 2011) for physical activity suggest that adults need to accumulate at least 150 min 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 min of moderate-to-vigorous physical activity on two or fewer days per week, we could be confident that participants were indeed “inactive.”

2. The cutoff point was 29 years of age 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”).

3. 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.

4. 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 SD above mean ratings of loneliness in these three studies.

References


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