

THE DILEMMA OF PROXY-AGENCY IN EXERCISE: A SOCIAL-COGNITIVE  
EXAMINATION OF THE BALANCE BETWEEN RELIANCE AND SELF-REGULATORY  
ABILITY

by

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A thesis

presented to the University of Waterloo

in fulfilment of the

thesis requirement for the degree of

Doctor of Philosophy

in

Kinesiology

Waterloo, Ontario, Canada, 2005

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## Abstract

Social Cognitive Theory (SCT: Bandura, 1997) has been used successfully in understanding exercise adherence. To date, the majority of the exercise research has focused on situations of personal agency (i.e., self as agent: e.g., McAuley & Blissmer, 2000). However, there are a number of exercise situations in which people look to others to help them manage their exercise participation by enlisting a *proxy-agent* (Bandura, 1997). While using assistance from a proxy can promote the development of self-regulatory skills, Bandura (1997) cautions that reliance on a proxy actually reduces mastery experiences which can result in an inability to self-regulate one's behaviour. Although research examined proxy-agency in exercise (e.g., Bray et al., 2001), the issue of reliance on the proxy at the expense of the participant's ability to adjust to exercise without that agent has not been investigated. This potential dilemma of proxy-agency in exercise was at the core of this dissertation and was investigated in a series of three studies.

Study 1 investigated whether those who differed in preferred level of proxy-contact also differed in their social-cognitions both within and outside a proxy-led exercise context. In addition, the relationships between proxy-efficacy, reliance and self-efficacy were examined. Results indicated that participants who preferred regular contact with an exercise proxy had lower self-regulatory efficacy, lower task efficacy, and weaker intentions in a proxy-led exercise context. Further, high-contact participants were shown to be less efficacious in dealing with the behavioural challenge of sudden class elimination. It was also demonstrated that higher reliance on the instructor was associated with lower self-efficacy and higher proxy-efficacy.

Study 2 served to extend the findings of Study 1 through the examination of behavioural differences characteristic of differential levels of preferred proxy contact and the reasons for use of proxy-agency. It was found that exercise class participants preferring high contact with a

proxy found exercising independently more difficult than did their low contact counterparts. It was also found that when faced with class elimination, those preferring high contact chose a self-managed activity alternative less frequently than did those preferring low contact. High contact participants also reported feeling less confident, less satisfied and perceived their alternative activity as more difficult than did those preferring low contact. In examining the reasons for preferring high proxy-contact, results indicated that a preference for high contact was associated with having had less experience exercising independently and allotting more responsibility for in-class participation to the class instructor as compared to preferring low proxy-contact.

Study 3 used Lent and Lopez's (2002) tripartite model of efficacy beliefs to examine the associations between relational efficacies (i.e., other-efficacy and relation inferred self-efficacy (RISE) beliefs, proxy-efficacy) and various social cognitions relevant to proxy-agency. Results revealed that relational efficacies were distinct yet related constructs which additively predicted self-regulatory efficacy, satisfaction, intended intensity and reliance. Relational efficacies were also shown to make unique contributions to the predictions of the relevant social-cognitions. It was also demonstrated that RISE beliefs were associated with the attributions participants made. Specifically, higher RISE beliefs was associated with making more internal, personally controllable and stable attributions. These results represent the initial examination of relational efficacy beliefs in the exercise literature and provide additional evidence of the proxy-agency dilemma in exercise.

Taken together, the present series of studies both support theorizing by Bandura on the dilemma of proxy-agency and represent an extension of the existing literature of proxy-agency in exercise. Results suggest that seemingly healthy, regularly exercising adults who choose to employ proxy-agency may be at risk for nonadherence in situations of behavioural challenge.

The current findings have important implications for exercise leaders and interventionists as they must be aware of the balance between helping and hindering.

## Acknowledgements

There are a number of people who I would like to recognize for their assistance and support over the past four plus years. First and foremost, I would like to acknowledge Dr. Larry Brawley for his continued guidance, support and friendship. Larry was the reason I came to UW and he has insured that it was the right decision. My development as a professional in the field is due to the unparalleled opportunities and expertise he has provided. There is no two ways about it, Larry's guidance and training has started my career and for this I am indebted to him.

I would like to thank my committee members for their contributions to the development of my research program. First, thank you to Drs. Curt Lox and Roger Mannell for contributing their expert perspectives. Thank you to Dr. Steve Bray who's guidance was instrumental and who's original work was the inspiration for my current line of research. Finally, to Dr. Kathleen Martin Ginis who has been a teacher, a mentor and a friend. You have helped me develop as well-rounded professional always encouraging me to pursue what I enjoyed, thank you.

Thank you to the many people I've met and worked with including Amy, Anita, Mary, Kelly, Tara, Mike, Ted, Allison and Adrienne. I am lucky to count you as colleagues but luckier still to count you as friends. Of course, I reserve a special thanks to Jen, Shae, Derek and Casey who's friendship was truly the best part of studying at UW. Friday nights at the pub were never about the pizza and beer for me.

Thank you to family and friends at home for understanding that this is a long process and for supporting me in it. The final thanks, as always, goes to my wife. Mary-Ann, you have stuck with me through everything, believing in me the whole time and now you have given me the greatest gift of all; thank you.

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## General Introduction

The numerous benefits of regular physical activity have been well established and disseminated to the public (e.g., Health Canada, 2004; United States Department of Health and Human Services, 1996). However, for over a decade, researchers have noted that at least 50% of people discontinue regular exercise within six months of beginning a new routine (e.g., Dishman, 1994; Meichenbaum & Turk, 1987; Wing, 2000). Exercise researchers and behavioural scientists have applied numerous theoretical models in an attempt to understand the exercise adherence problem. One theory that has been used successfully in understanding aspects of exercise behaviour is Bandura's (1986, 1997, 2001) Social Cognitive Theory (SCT).

The fundamental premise of SCT is that people play a role in their self-development, adaptation and self-renewal through mechanisms of agency (Bandura, 2001). Bandura (2001) differentiates between three modes of agency: personal agency (self as the agent), collective agency (a group collective as the agent), and proxy agency (a third party acts as the agent on one's behalf). For each mode of agency, efficacy beliefs, or the capabilities to manage and carry out the necessary steps to produce desired outcomes (i.e., personal agency = self-efficacy; collective agency = collective efficacy; proxy-agency = proxy-efficacy) are the foci of study.

Within SCT, efficacy beliefs are linked with a number of social-cognitions such as behavioural intentions, causal attributions and perceived effort (cf. Bandura, 1986). While these relationships have been repeatedly outlined by Bandura (1986, 1997, 2001) a brief synopsis serves as a reminder. Specifically, stronger efficacy beliefs are postulated to be positively related to behavioural intentions, described by Bandura (1997) as proximal goals (also see Maddux, Brawley & Boykin, 1995). It is suggested that the more efficacious that people are in performing a given behaviour, the more they will *intend to carry out* these actions (Bandura,

1997). Efficacy beliefs are also suggested to positively influence individuals' causal attributions with those reporting higher efficacy also providing more stable and personally controllable attributions for their exercise performances (cf. Biddle, Hanrahan, & Sellars, 2001). Finally, Bandura (1997) suggests that self-efficacy is associated with effort expended, with individuals who feel more efficacious exerting themselves to a greater extent in a given situational context.

The majority of research using SCT in the exercise domain has focused on personal agency with the primary construct of interest being self-efficacy (cf, Bandura, 2001; Lent & Lopez, 2002). Self-efficacy is defined as the belief in one's own abilities to satisfy situational demands in a given context (Bandura, 1997). It has been repeatedly demonstrated that self-efficacy is a primary construct in determining exercise behaviour, and that it is associated with activity choice, effort expended, as well as persistence to overcome obstacles to a given performance (e.g., McAuley & Blissmer, 2000).

However, there are a number of exercise situations in which people look to others to help them manage their exercise participation, achieve their goals or satisfy situational demands. In these situations people employ proxy-agency by enlisting the help of a proxy-agent. Proxy-agency is a socially-mediated form of control. It involves individuals obtaining help from others who are knowledgeable or powerful in order to bring about the individuals' desired outcomes (Bandura, 1997).

Bandura (1997, 2001) outlines 3 main reasons why individuals may turn to a proxy. These are that (a) they have not developed the means to reach their desired outcome(s), (b) they believe a proxy can better help them achieve the outcomes, and (c) they do not want the personal responsibility of direct control over the possible outcomes. Baltes (1996) notes that proxy-

agency is often a necessary approach to successfully achieving many of one's desired outcomes in life and can be an effective process for self-development, and adaptation.

The importance of proxy-agency may be considerable in exercise, as a proxy-agent can help individuals manage the multiple self-regulatory behaviours necessary for their continued exercise adherence (e.g., Rejeski, Brawley, Ambrosius et al., 2003) by helping them with time management and skill development. It is essential to have an understanding of how the proxy - individual relationship has been studied from the perspective of the SCT-based exercise literature. Therefore, the subsequent sections provide a review of the theoretically-based literature on proxy-agency in exercise.

### *Previous Literature*

Historically, there has been very little research on proxy-agency in exercise that has been guided by Bandura's theorizing. Recently, however, a series of studies conducted by Bray and colleagues in both asymptomatic (Bray, Gyurcsik, Culos-Reed, Dawson, & Martin, 2001; Bray, Gyurcsik, Martin Ginis, & Culos-Reed, 2004) and diseased (Bray & Cowan, 2002; Bray & Cowan, 2004) exercise populations has provided insights into the influence of proxy-agents on participants' social-cognitions and exercise behaviour.

Bray et al., (2001) examined the relationships between proxy-efficacy, self-efficacy and exercise performance in fitness classes among female exercise initiates and experienced exercisers over a 10-week exercise program. Proxy -efficacy was operationalized as participants' confidence in the ability of their instructor to teach, communicate and motivate. Proxy-efficacy was found to be significantly correlated with exercise- and scheduling-efficacy. Participants reporting higher efficacy in their fitness instructor's ability to lead them through in-class tasks also reported higher confidence in their own ability to perform the exercises and to schedule their

exercise sessions. Proxy-efficacy was also found to be a significant predictor of exercise class attendance, accounting for 12% additional variance over and above that accounted for by barrier, scheduling and exercise self-efficacy.

In more recent work, Bray et al., (2004) have shown that proxy-efficacy can be manipulated through changes in the proxy's behaviour. Using a 2 x 2 design, both the leadership style and/or the choreography presented by exercise class instructors was manipulated to be either bland or enriched. Results indicated that those participants in the enriched leadership condition reported higher proxy-efficacy in regards to the instructor's ability to motivate and communicate with them in class. In addition, participants in the enriched choreography condition reported higher confidence in their instructor's ability to perform appropriate and challenging choreography.

Bray and his colleagues have also demonstrated the importance of studying proxy-efficacy among diseased populations (e.g., cardiac rehabilitation patients). Bray and Cowan (2002) found that in a sample of predominantly male, cardiac exercise rehabilitation participants, proxy-efficacy was a significant predictor of exercise enjoyment, accounting for additional variance (13%) over and above that contributed by self-efficacy. In a second study of cardiac rehabilitation participants, Bray and Cowan (2004) found that proxy-efficacy and program attendance were found to additively predict exercise self-efficacy and that proxy-efficacy was positively associated with exercise intentions.

The work by Bray and colleagues has provided valuable insights into the influence of proxy-agents on the social-cognitions and behaviour of exercise class participants, suggesting that participants' confidence in the proxy-agent's abilities is associated with participants' self-efficacy, affect, and actual exercise behaviour. Whereas these studies represent the preliminary



evidence about the study of proxy-agency in exercise, additional methodological and theoretical issues deserve attention.

### *Capturing Proxy-Agency*

In Bray et al.'s (e.g., Bray et al., 2001) work, proxy-efficacy was operationalized through measures of participants' confidence in the abilities of their instructor to teach, communicate and motivate. In Bandura's (1997) discussion of proxy-agency he emphasizes that individuals look for assistance from a proxy-agent who can "help them manage" (p. 207) the many aspects required for successful behavioural adaptation. Therefore, an essential element of proxy-agency is that the proxy is perceived to *provide assistance* to individuals *to help them manage* their behaviour in order to achieve their goals. The operationalization of proxy-efficacy as provision of assistance to help manage differs from the perception of an instructor's abilities. As such, incorporating the notion of the proxy's provision of assistance into the measurement of proxy-efficacy may represent an important conceptual and methodological improvement that needs to be examined in future research of proxy-agency in the exercise context.

Therefore, for the purposes of the studies in this dissertation, and consistent with Bandura's (1997) theorizing, proxy-efficacy is defined and operationalized as, "an individual's confidence in a proxy-agent's abilities to provide assistance *to help the individual* perform task and/or self-regulatory behaviours required to meet the situational demands." This definition is both (a) consistent with Bandura's theorizing on proxy-agency, capturing the emphasis placed on the importance of the assistance provided to the individual, and (b) is in keeping with Bandura's conceptualization of efficacy beliefs. It is argued that this aid or helping aspect of the definition and the operationalization of that idea more specifically captures the essence of proxy-agency as theorized by Bandura (1997) than previous exercise measures.

### *Dilemma of Proxy-Agency: Dependence*

Currently, the proxy-agency literature concerns the potential influence of proxy-agency in exercise from the perspective of the positive outcomes that may occur for the person who uses a proxy. Indeed, Bandura (1997) suggests that in situations of proxy-agency, the interaction of personal capabilities and the capabilities of the proxy-agent often help to influence successful behavioural adaptation and promote self-regulatory development of proxy users. However, Bandura (1997) also outlines a dilemma that becomes probable the more the proxy is utilized. This dilemma concerns the notion of increasing dependence on the proxy by individuals. Specifically, he cautions that over-reliance on a proxy may actually “impede the cultivation of personal competencies” (Bandura, 2001, p. 13), and “reduces the opportunities to build skills needed for efficacious action” (Bandura, 1997, p. 17). Thus, individuals may enter into state of proxy-dependency when it is easier to obtain their desired outcomes by using the proxy than developing and using their own skills. Bandura (2001) notes that “part of the price of proxy agency is a vulnerable security that rests on the competence, power, and favors of others.” (p. 13). Therefore, it would seem that when individuals attempt to achieve their goals through the use of proxy-agency the consequences are either (a) adaptive, facilitating the development of self-regulatory skills, or (b) detrimental, fostering a sense of dependence and impeding self-regulatory development.

The problematic consequences of dependence become evident when individuals are confronted with a behavioural challenge. In relation to exercise, an example of this challenge may be when individuals no longer have access to their proxy-agent and must attempt to self-manage their behaviour. Previous exercise research has not examined the influence of proxy-

agency on the social-cognitions and behavioural decisions of individuals when participants must address the challenge of exercising without the proxy.

Lent and Lopez (2002) note that understanding the interpersonal context of efficacy beliefs will have valuable implications for those social agents who wish to promote the well-being or development of other persons, a point that will be expanded upon later in the introduction of Study 3. This is especially true in exercise, as individuals often require assistance from a proxy during the adoption phase of exercise when exercise skills, training methods, and adherence skills are unknown or erratically used. If those individuals attempting to adopt exercise in a proxy-led context are not taught or do not learn self-regulatory adherence skills because they rely on the proxy, self-managed exercise adherence may suffer.

Consider the possibility of over-reliance in terms of the prevalence of the use of proxy-agency in physical activity situations in community (e.g., exercise classes: Bray et al., 2001) and health care settings (e.g., cardiac rehabilitation: Bray & Cowan, 2004; nursing homes: Baltes & Baltes, 1990). Variable and poor adherence rates reported among participants (e.g., Dishman, 1994) across a variety of proxy-led contexts suggest the need for a closer examination of this relationship. The potential implications of over-reliance on a proxy-agent on long-term exercise adherence underscore the need to better understand the proxy-agent – individual exerciser relationship. Indeed, Meichenbaum and Turk (1987) have suggested that to promote treatment adherence, a collaborative relationship between the practitioner and participant is necessary to develop commitment and learn self-regulatory skills. This collaborative relationship clearly implies that participants assume increasing amounts of responsibility for their adherence rather than simply following a practitioner's (i.e., proxy) instruction.

Therefore, the purpose of the thesis was to extend the current exercise literature on proxy-efficacy. Specifically, investigations examined some of the social-cognitive and behavioural relationships that reflect upon the dilemma related to the use of proxy-agency in exercise . A series of three studies was conducted.

Study 1 examined aspects of the dilemma by considering Bandura's notions within a 2 (high and low proxy-contact) by 2 (normal and behavioural challenge conditions) mixed factorial design. The relationships between proxy-agency, self-efficacy, and reliance on the proxy were observed across these conditions.

Study 2 extended the initial observations of Study 1 by also considering whether over-reliance on a proxy-agent may result in an inability and disinterest in exerting direct control. Specifically, the same design was used in Study 2 to consider the relationships between preferred level of proxy contact, perceptions of satisfaction and of exercise difficulty as well as the behavioural choices individuals make when faced with a behavioural challenge. Study 2 also examined the factors that play a role in why individuals prefer to employ proxy-agency.

Study 3 was based on both Bandura's (1997) Self-efficacy Theory and Lent and Lopez's (2002) recent conceptual view of relational efficacy beliefs in situations of proxy-agency. The specific and additional foci of Study 3 examined were (a) if the various efficacy beliefs (i.e., self-efficacy; proxy-efficacy; other-efficacy; and relation-inferred self-efficacy) that occur within the context of the use of exercise proxy-agency could be empirically differentiated and (b) the nature of attributions made by those differing in their levels of relation-inferred self-efficacy. Social-cognitive relationships observed in Studies 1 and 2 also continued to be examined.

## Study 1

Research by Bray and colleagues in both asymptomatic (e.g., Bray et al., 2001) and diseased (e.g., Bray & Cowan, 2004) exercise populations has provided evidence of the importance of studying proxy-agency in structured exercise settings by demonstrating a number of the interrelationships between proxy-efficacy and other social-cognitions. These studies have provided valuable insight into the influence of proxy-agency in exercise and represent the first steps in understanding the influence of the use of proxy-agents on exercise behaviour. Bray et al., (2001) however, acknowledge that the role of proxy-agency in exercise and its relationship with other related social-cognitions needs to be examined.

Turning to a proxy for assistance can be beneficial and is often done willingly by persons who feel the proxy will help them achieve their desired outcomes (Bandura, 1997). However, an interesting dilemma arises as a function of the interaction between the proxy and the participant. Bandura (1997) warns that although using assistance from a proxy can promote the development of self-regulatory skills, reliance on a proxy actually limits the opportunity for personal mastery experiences. In turn, this absence of mastery experience leads to an inability to self-regulate one's behaviour. This inability to self-regulate would not become an apparent problem until individuals have confronted challenges to their self-management of exercise outside of the proxy-led context.

The notion of reliance is particularly important when one considers being confronted with a behavioural challenge. In exercise, this may be that individuals no longer have access to their proxy-agent and therefore are forced to self-manage their behaviour without assistance. If individuals are always looking to a proxy-agent for assistance with successful behavioural performance, will they have developed the beliefs about self-regulatory skills (e.g., self-efficacy)

to deal with a behavioural challenge? Previous research has not examined the influence of proxy-agency on the social-cognitions outside of the proxy-led context.

A second, but related question is whether all participants in a proxy-led context prefer to utilize the proxy to the same extent. This preference could alter the balance between reliance on proxy –regulation of exercise and the participant’s ability to self-regulate exercise.

In light of the potential connection between proxy-agency and behavioural dependence, a general goal of the present study was to extend the initial work by Bray and colleagues (Bray et al., 2001; Bray et al., 2004) by introducing the notion of an individual’s reliance on a proxy agent. To accomplish this, the current study had two primary purposes.

The first purpose was to determine whether there are social-cognitive differences between those who prefer a high level of contact with a proxy in exercise situations and those who prefer to exercise on their own. Further, for participants who had these differential preferences, their social cognitions were examined relative to two exercise contexts; first a proxy-led class and second, when suddenly having to exercise on their own (i.e., behavioural challenge).

The second purpose was to examine relationships between proxy-agency and reliance. These relationships were considered at several levels. The first level was to determine whether there are differences in the self-regulatory efficacy and proxy-efficacy reported by exercisers with high and low reliance on an exercise proxy. Second, it was also of interest to determine whether self-regulatory and proxy-efficacy were predictors of reliance on an exercise proxy.

## Methods

### *Participants*

Sixty-six active, healthy, adult volunteers participated in the study. Male and female participants ranged in age from 18 to 60 years ( $M_{age} = 29.25$  yrs,  $SD = 10.28$ ) and were recruited from different community and university fitness facilities. Recruitment from structured exercise classes insured that proxy-led exercise participation was salient to study participants and therefore, allowed the measurement of social-cognitions related to proxy-agency. All class instructors were certified to teach group fitness by a nationally recognized accreditation and certification program (i.e., Can-Fit-Pro). The sample was comprised predominantly of females (95.4 %) which is reflective of the general demographic of participants from fitness classes (Canadian Fitness and Lifestyle Research Institute, 2001). For the large majority of participants (90.6%) this was not the first time they had attended fitness classes. Participants engaging in physical activity prior to participating in their current fitness class (87.3%), reported engaging in five sessions ( $M = 5.44$ ,  $SD = 4.82$ ) of at least 30 minutes of exercise per week over the last month.

### *Design*

The study design was a 2 x 2 mixed factorial with the between subjects factor being preference for proxy contact (i.e., high versus low) and the within subjects factor being exercise context (i.e., proxy-led class versus exercising independently).

*Preferred level of proxy contact.* For the between groups condition, participant's self-selected their preferred level of proxy contact. Specifically, participants were asked to indicate the means with which they preferred to carry out their exercise *most of the time*. Participants

responded with either frequent to occasional contact or self-guided activity with infrequent contact.

*Behavioural challenge manipulation of exercise context.* Participants were first exposed to questions concerning their exercise class participation. Following responses to these questions, participants then received instruction concerning a hypothetical situation where they suddenly could no longer rely on the presence of either the instructor or the exercise class for their regular participation. Specifically, participants were instructed to “answer the following sets of questions under the assumption that all available exercise classes are completely cancelled and unavailable as an exercise option.”

### *Measures*

Consistent with the within subjects aspect of the design, participants were asked two major series of questions that concerned their participation in different exercise contexts. The first series of questions evoked responses with respect to their self-efficacy and intentions about their current participation in exercise classes. The second series of questions evoked responses with respect to their self-efficacy and intentions after being presented with the behavioural challenge of exercising independently (the questionnaire package is presented in Appendix A).

### *Efficacy Measures*

In accordance with recommendations presented in recent reviews of exercise self-efficacy (McAuley & Mihalko, 1998, McAuley, Pena & Jerome, 2001) multiple measures of self-efficacy were employed. Specifically, measures of self-regulatory and task-efficacy were taken for both the normal and behavioural challenge conditions. All efficacy scales were measured using a confidence scale ranging from 0% (not at all confident) to 100% (completely confident). Item



scores for each scale were then summed and averaged to provide an indication of the mean efficacy out of 100%.

*Exercise management efficacy.* This form of self-regulatory efficacy concerned participants' confidence in their ability to manage various aspects of their weekly exercise participation over the next eight weeks. This construct was assessed across 8-items concerning a variety of self-regulatory behaviours necessary to maintain regular exercise participation such as motivating oneself, scheduling exercise sessions, designing an appropriate exercise program, using effective technique and monitoring exercise progress. It has been noted that managing multiple self-regulatory behaviours is necessary for continued exercise adherence (e.g., Brawley, Rejeski & King, 2003). Example items included participants' confidence in their ability to "Use safe, effective exercise technique" and "Set realistic exercise goals for yourself." Internal consistency was found to be acceptable for both "proxy-led" ( $\alpha = 0.88$ ) and "independent" ( $\alpha = 0.94$ ) assessments (Tabachnik & Fidell, 1996). Both measures of exercise management efficacy were also subjected to a principal components analysis. Items were found to load on a single component for the measures in both situations (all factor loadings  $> .72$ ).

*Exercise efficacy.* This 3-item measure assessed participants' confidence in performing the aerobic, resistance and flexibility portions of an exercise program over the next eight weeks. As per guidelines set out in Canada's Physical Activity Guide (Health Canada, 2004) all of these are important aspects of exercise routine. Each item was preceded by "How confident are you that YOU can manage the following aspects of your exercise program over the next 6 weeks?" An example item was "Perform appropriate stretching activities." In the present study, this measure reflected acceptable levels of internal consistency for both the "proxy-led" ( $\alpha = 0.84$ ) and "independent" ( $\alpha = 0.83$ ) assessments (Tabachnik & Fidell, 1996). In addition to scale

internal consistencies, both measures of exercise efficacy were subjected to a principal components analysis to insure that the items were assessing the same construct. In both instances the three items were found to load on a single component indicating that these items measured a single construct (all factor loadings > .80).

*Proxy-efficacy.* This nine-item measure concerned participants' confidence in the ability of their exercise class instructor to help them manage specific aspects of their regular exercise participation over the next eight weeks. Items described the same variety of self-regulatory behaviours necessary to maintain regular exercise participation captured in the exercise management efficacy questions (e.g., schedule exercise sessions, use effective technique, monitor exercise progress). In order to insure that participants only provided efficacy values for those aspects on which they needed help, participants were first asked to indicate the aspects for which they required instructor assistance. For the items indicated, participants then indicated their confidence that the instructor could help them.

*Exercise intentions.* Intention was assessed as a behavioural self-prediction (cf. Fishbein & Stasson, 1990) and included measures of both frequency and strength. Within the normal condition of class participation, participants were asked to forecast the minimum number of times per week they would *attend their scheduled exercise class* over the next eight weeks (i.e., frequency). Within the behavioural challenge condition, participants were asked to forecast the minimum number of times per week they would *exercise* over the next eight weeks. No mention of the structured class was made in the challenge condition. The strength of each of the intentions was then assessed using a nine point scale (1 = "definitely will not"; 9 = "definitely will") because individuals frequently set exercise goals at a level beyond that which they will actually carry out. In order to avoid the mathematical problems of using multiplicative

composites (Evans, 1991), intention frequency and intention strength were treated as separate variables in the analyses.

*Reliance.* This measure concerned participant's reliance on the class instructor for assistance in managing specific aspects of their regular exercise participation over the next eight weeks. Participants were first presented with nine aspects about managing regular exercise participation (e.g., scheduling, goal setting, motivation) and were asked to indicate which aspects they counted on their class instructor for assistance. The content of these items was related to aspects of self-regulation, however, the value provided indicated a participant's reliance on the instructor for each aspect consistent with the notion that the instructor is used as *the means of attaining* that aspect of exercise management. An example item was "Over the next 8 weeks, I will count on the class instructor to help me monitor and regulate the intensity of my exercise appropriately." For the items indicated, participants then indicated the degree to which they relied on the instructor using a nine-point scale (1 = "count on a minimal amount of time"; 9 = "count on most of the time"). The scores for the items that participants selected were summed then averaged to provide an indication of the mean reliance out of nine. Measuring reliance in this way allowed for both the assessment of the number of aspects of exercise management on which participants relied, as well as the extent of their reliance. This measurement approach also insured that reliance was only assessed for those areas of assistance salient to each participant and avoided diluting the extent of reliance reported by including items that were not relevant to the participant. For example, a participant could be highly reliant on the instructor for one management skill but prefer to self-manage much of their own exercise. Thus a low number of relied upon skills would be indicated but high reliance for a single skill would be reported.

Responding to every skill would not differentiate frequency and when summed and averaged would reflect a low reliance score.

### *Procedure*

Participants were recruited from structured exercise classes by an investigator trained in the assessment procedure to ensure consistency of administration. The investigator delivered a standardized request for volunteer participation which adhered to university research ethics guidelines for research with human subjects. Participants were provided with the purpose and procedures of the study and their anonymity was guaranteed. Each participant was instructed to take as much or as little time as was needed to complete the questionnaire. In addition to the constructs under study, participants also completed measures of demographic and physical activity history. Measures were administered two weeks following the beginning of the new sessions of exercise classes in 10 week exercise programs to allow for participants' familiarization with their class and instructor. This time frame has also been suggested to allow for sufficient mastery experiences appropriate for the participants' adjustment of their efficacy beliefs to their specific situation (e.g., McAuley & Mihalko, 1998). Whenever possible, questionnaires were collected by the researcher immediately following completion. However, participants unable to complete the questionnaires at the time of administration were asked to return completed questionnaires within one week to a secure drop-box located at the front desk of the respective facilities which guaranteed the confidentiality of their responses.

## Results

### *Data Management.*

Data management strategies were used to address missing data, the presence of outliers as well as to assess and insure normality. These data management procedures were used in all three studies, however, to avoid redundancy will only be described here.

*Missing Data.* Missing data was addressed using a two-pronged approach as recommended by Tabachnick and Fidell (1996). Specifically, if a participant was missing a value for a scale then the participant's mean for the remainder of the scale was inserted. However, if a participant was missing values for an entire scale, the sample mean for that scale was substituted. Data substitution was only employed if less than 10% of the data were missing. For the sake of brevity, missing data and the accompanying replacement values will not be reported.

*Outliers.* Outliers in the data sets were initially detected through examination of the range of values for each variable and then by graphical examination of the data. Following the guidelines for smaller samples, a value was deemed an outlier based on having a standardized Z-score greater than 3.29 (Tabachnick & Fidell, 1996). These values were then treated in accordance with Tabachnick and Fidell's (1996) recommendations, being replaced with a score that was "one unit larger (or smaller) than the next most extreme score in the distribution" (p. 69). Outlier occurrence was minimal. Three outliers were detected in the data for Study 1 while only one value was deemed to be an outlier in each of Studies 2 and 3. For the sake of brevity these values will not be reported.

#### *Differences Between Participants from Registered and Drop-in Classes*

Two thirds of the participants were drawn from drop-in fitness classes ( $n = 44$ ) while the rest were recruited from registered structured exercise classes ( $n = 22$ ). As the sample was drawn from both registered and drop-in classes, multiple MANOVA and Chi square procedures

were used to examine any possible differences between these sample subgroups relative to both demographics and exposure to a proxy leader. There were no differences detected across physical activity history, or any of the efficacy, intention or reliance variables (all  $ps >.05$ ). Analysis of the demographic variables did indicate that those participants drawn from registered fitness classes, on average, were younger ( $F(1) = 11.98, p = .001; M = 22.64$  years) than those drawn from drop-in classes ( $M = 32.41$ ). This is not surprising as the majority (86.4 %) of those drawn from registered fitness classes were recruited from university rather than community-based fitness facilities. It was also found that 76.2% of those attending drop-in classes spent greater than 50% of their scheduled activity time in the specific drop-in class with 43% of these participants spending more than 75% of their activity time in that class. Thus a majority of participants recruited from the drop-in classes *regularly used a specific class* as their main forum for regular exercise participation. In considering the collective similarities between registered and drop-in class participants, and the fact that there were no differences across other study variables, the decision was made to combine these samples. Therefore, the data from participants drawn from registered fitness classes were pooled with the data from those participants recruited from drop-in classes, with the full sample being used in all subsequent analyses.

### *Analytic Strategy*

The analyses were conducted in three stages. The first stage consisted of calculating descriptive statistics for all assessed variables. The second stage of analysis was conducted to examine whether there were social-cognitive differences between those who prefer frequent contact with a proxy and those who prefer to exercise more independently in two different exercise contexts. A 2 (preferred proxy contact) by 2 (exercise context) mixed model

MANOVA with Bonferroni corrected follow-up analyses was conducted. In examining effects, results were only interpreted if the overall MANOVA first reached the traditional level of statistical significance (e.g.,  $p < .05$ ). While focusing on the omnibus F-test may ignore potentially interesting univariate effects, the current, conservative approach was taken in order to minimize the possibility of making a type I error (e.g., Tabachnick & Fidell, 1996).

The third stage included analyses conducted to examine the relationships between proxy-efficacy, self-efficacy and reliance on proxy-agents. Specifically, a one-way, between groups MANOVA was conducted to examine whether participants with different levels of reliance differed in their self- and proxy-efficacy cognitions. This was followed by a hierarchical linear regression to determine if these efficacy cognitions predicted participants' reliance on their instructor for assistance.

### *Descriptives*

Consistent with participants' common experience with exercising in structured class settings, descriptive statistics indicated that participants were fairly efficacious about their ability to manage their regular exercise participation ( $M = 75.53$ ,  $SD = 14.60$ ). They were also confident in the ability of their class instructor to help them manage their exercise participation ( $M = 76.83$ ,  $SD = 14.69$ ; 0-100% scale). Finally, participants reported relying on their class instructor for help with four aspects of managing their exercise participation ( $M = 4.18$ ,  $SD = 1.82$ ; 0-9 scale) and for slightly more than half the time ( $M = 6.17$ ,  $SD = 1.80$ ; 1-9 scale).

### *Social-Cognitive Differences Across Preferred Level of Contact in Normal and Challenge Exercise Contexts*

*Classification of participants to preferred level of proxy contact.* Based on their responses to the question regarding preferred level of proxy contact, participants self-selected to

one of two groups—high contact preference or low contact preference. This selection resulted in two levels of preferred proxy contact (i.e., the between subjects factor); a preference for high contact group of those participants preferring occasional or frequent contact ( $n = 30$ ) and a low preference for contact group of those preferring infrequent contact ( $n = 35$ ). This dichotomous classification was used as the between subjects factor to examine the relationships between preferred level of proxy contact and (a) self-regulatory efficacy, (b) task-efficacy, (c) intention frequency, and (d) intention strength.

The second factor of exercise context was within subjects and had two levels; exercise with a proxy and exercise without the proxy and class. Thus the 2 by 2 factorial design was mixed and formed the basis for subsequent analyses.

However, prior to conducting analyses regarding efficacy and intentions, analyses were conducted to examine the possibility of group differences across demographic and physical activity history variables. A one-way MANOVA with age, total months as a member at the club, how long participants had participated in exercise classes and average times exercising per week as the dependent variables indicated no significant differences between the high preferred and low preferred contact groups (Wilks'  $\lambda = .965$ ,  $F(4, 45) = 0.40$ ,  $p = .804$ ).

#### *Social-Cognitive Differences*

A 2 between (preferred contact: high contact/low contact) by 2 within (exercise context: normal condition/challenge condition) subjects mixed model MANOVA procedure was conducted to examine differences in social cognitions. The MANOVA revealed a number of significant multivariate effects.

*High and low preferred proxy-contact.* A significant multivariate between subjects main effect was found for preferred level of contact (Wilks'  $\lambda = .738$ ,  $F(4, 60) = 5.33$ ,  $p = .001$ ,



observed power = .961). Univariate F-tests indicated that those who preferred a higher level of contact with an exercise proxy reported lower self-regulatory efficacy, lower task efficacy, intended to exercise less frequently, and reported weaker intentions to exercise than their counterparts (Table 1).

Table 1

*Study 1 Main Effects for Preferred Level of Proxy Contact*

|                          | High Contact | Low Contact | $\eta^2$ | p.   |
|--------------------------|--------------|-------------|----------|------|
| Self-regulatory efficacy | 65.37        | 79.54       | .22      | .001 |
| Task efficacy            | 69.35        | 80.34       | .09      | .015 |
| Intention frequency      | 2.92         | 4.03        | .11      | .008 |
| Intention strength       | 7.17         | 7.94        | .14      | .002 |

*Note.* Efficacy 0 - 100% scales, Intention frequency 0-7 scale, Intention strength 1-9 scale

*Exercise context.* A significant multivariate within subjects main effect was found for context (Wilks'  $\lambda = .512$ ,  $F(4, 60) = 14.31$ ,  $p < .001$ , observed power = 1.00). Univariate F-tests indicated that participants had lower self-regulatory efficacy, lower task efficacy and weaker intentions to exercise when they were faced with the behavioural challenge of exercising on their own as compared to responses under normal proxy-led exercise conditions (Table 2).

Table 2

*Study 1 Main Effects for Exercise Context*

|                          | Normal | Challenge | $\eta^2$ | p.   |
|--------------------------|--------|-----------|----------|------|
| Self-regulatory efficacy | 75.85  | 69.07     | .32      | .001 |
| Task efficacy            | 79.73  | 69.97     | .29      | .001 |
| Intention strength       | 8.10   | 7.00      | .24      | .001 |

*Note.* Efficacy 0 - 100% scales, Intention frequency 0-7 scale, Intention strength 1-9 scale

*Contact preference by exercise context interactions.* However, these main effects were superseded by a significant preferred contact by exercise context multivariate interaction (Wilks'  $\lambda = .736$ ,  $F(4, 60) = 5.39$ ,  $p = .001$ , observed power = .963). Subsequent univariate F-tests revealed that the interaction was significant for both self-regulatory efficacy ( $F(1) = 17.44$ ,  $p < .001$ ,  $\eta^2 = .22$ ) and task-efficacy ( $F(1) = 6.53$ ,  $p = .013$ ,  $\eta^2 = .09$ ).

Post-hoc Bonferroni corrected tests for the interactive effect on self-regulatory efficacy indicated that participants preferring a higher level of contact with an exercise proxy were less efficacious about dealing with the behavioural challenge of exercising *independently*. Specifically, when facing a behavioural challenge, high preferred contact participants' self-efficacy ( $M_{HI-BC} = 59.37$ ) was significantly lower than that reported by their low preferred contact counterparts ( $M_{LO-BC} = 78.77$ ). This was also the case when high contact individuals' confidence in the behavioural challenge context was compared to both their own confidence ( $M_{HI-NORM} = 71.37$ ) and the confidence of the low contact comparison group ( $M_{LO-NORM} = 80.32$ , all  $ps < .05$ ) for the non-independent, proxy-led condition. The nature of this interaction is illustrated in Figure 1.

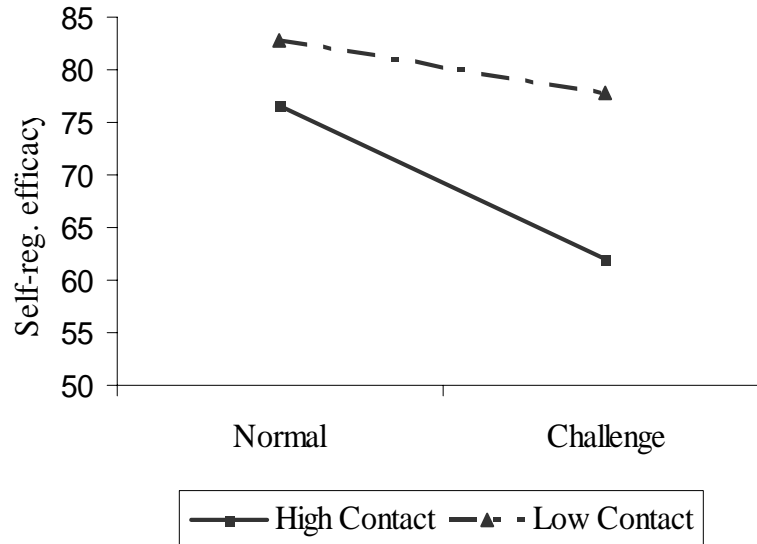


Figure 1. Study 1 Contact by context interaction for self-regulatory efficacy

Post-hoc Bonferroni tests were also conducted to examine the nature of the interaction for task-efficacy. It was found that the direction of the means was virtually identical to that seen for self-regulatory efficacy. High contact participants reported lower task efficacy when facing independent exercise than that reported by low contact participants in this exercise context ( $M_{HI-BC} = 62.04$  vs.  $M_{LO-BC} = 77.89$ ,  $p < .05$ ). High contact participants' task-efficacy when facing independent exercise was also lower than that reported by either group for the non-independent, proxy-led condition ( $M_{HI-NORM} = 76.67$ ,  $M_{LO-NORM} = 82.79$ ,  $p < .05$ ).

#### Reliance on the Proxy

An examination of social cognitive differences among participants higher and lower in reliance was conducted using extreme groups comparisons. The rationale for the extreme groups procedure was that if extent of reliance on the proxy is associated with social cognitions such as self-efficacy and proxy-efficacy, then individuals who differ most on reliance would be most likely to exhibit characteristic differences in these social cognitions. A tertile split on the

reported level of reliance on the instructor was used to determine the upper and lower thirds of the sample as the comparison groups. If differences in efficacy cognitions were not observed among extreme group participants, it is improbable that they would be observed in the entire sample.

The extreme group split resulted in a highly reliant group ( $M = 7.84, n = 20$ ) and a moderately reliant group ( $M = 4.05, n = 19$ ). A t-test confirmed that these two groups truly differed on level of reliance on the instructor ( $t(37) = 10.36, p < .001$ ). With this independent groups difference criterion confirmed, further analyses proceeded.

Differences in in-class self-efficacy and proxy-efficacy were examined across high and low reliance groups using a one-way between groups MANOVA. The overall MANOVA was significant, Wilks'  $\lambda = .658, F(2, 36) = 9.37, p = .001$ . Subsequent univariate F tests revealed that those who were highly reliant had higher proxy-efficacy ( $M = 84.52$ ) than those who were moderately reliant ( $M = 69.04, F(1) = 12.50, p = .001, \eta^2 = .25$ ). It also appeared that those who were highly reliant reported having lower self-regulatory efficacy ( $M = 73.31$ ) than their moderately reliant counterparts ( $M = 81.14, F(1) = 3.99, p = .053, \eta^2 = .10$ ).

Observation of differences among this sample of regular exercise class participants would also suggest that although these participants all reported being relatively active (*i.e.*, five 30 min sessions/wk), they were not homogeneous in terms of their various efficacy beliefs and other social cognitions.

*Prediction of Reliance.* Hierarchical multiple regression analysis was used to determine the strength of the relationship between reliance on the instructor and self- and proxy-efficacy. Given the previous literature supporting Bandura's (1997) assertion that proxy-efficacy may contribute to behavioural adaptation beyond that of self-efficacy (e.g., Bray et al., 2001), self-

regulatory efficacy was entered in the first block and then proxy-efficacy on the second block of the regression equation.

The overall model was significant, accounting for 23% of the total variance in reliance on the instructor ( $R^2_{Adj.} = .229, p < .001$ ). Self-efficacy accounted for 9% of the variance ( $R^2_{\Delta} = .093, p = .018$ ) with proxy-efficacy adding an additional significant 16% ( $R^2_{\Delta} = .162, p = .001$ ) of the variance. Standardized Betas indicated an inverse relationship between self-regulatory efficacy and reliance ( $\beta = -.332, p = .005$ ). Proxy efficacy was positively related to reliance on the instructor ( $\beta = .403, p = .001$ ).

### *Summary of Results*

To summarize, a number of significant effects were observed when the social cognitions of participants were examined with respect to the preferred contact by exercise context design. The interaction effects, however, were most revealing. These interactions indicated differential social-cognitive responses to the behavioural challenge of the independent exercise context by those participants differing in their preferred level of contact with a proxy.

Specifically, there were preferred contact by exercise context interactions for both self-regulatory and task-efficacy. Participants preferring frequent contact with an exercise proxy were seen to have lower self-regulatory and task efficacy in the behavioural challenge of the independent exercise context.

In addition to the significant interactions, a number of significant main effects for preferred level of contact and exercise context were observed. Results were in the expected direction with participants preferring a high degree of proxy contact reporting lower levels of self-efficacy and intentions, and all participants reporting lower self-regulatory efficacy, task-efficacy and strength of intentions when forced to consider exercise without their proxy.

In the analyses of the instructor reliance responses, it was observed that higher reliance on the instructor was associated with higher proxy-efficacy and lower self-regulatory efficacy. Regression analyses also showed that proxy-efficacy was an independent predictor of reliance on the instructor, accounting for additional variance over and above that accounted for by self-regulatory efficacy.

### Discussion

The results of the present study provide an initial perspective about the social cognitions of individuals exposed to the dilemma of utilizing proxy-agency in exercise. The results suggest that increased use of a proxy-agent can be related to decreased self-efficacy for the management of independent exercise. The relationships observed suggest support for Bandura's premises about proxy-agency as advanced in social-cognitive theory. Two specific points are supported. The first concerns the link between preferred level of proxy-contact and social-cognitions in both proxy-led and independent exercise contexts, while the second concerns the relationships between self-efficacy, proxy-efficacy and reliance.

First, Bandura (1997) states that use of proxy-agency may limit the opportunity for mastery experiences and subsequently inhibit the development of self-regulatory skills necessary for dealing with the management of exercise away from the proxy-led context. The present study provided preliminary support for this assertion with respect to the self-regulatory beliefs held by individuals who prefer to use proxy agency. Specifically, the interaction between preferred contact and exercise context indicated that those preferring frequent contact with a proxy were less confident in their abilities to manage when presented with the challenge of independent exercise. The current results also revealed that regardless of exercise context,

preferring frequent contact was shown to be associated with lower self-efficacy and weaker exercise intentions.

Second, Bandura (1997) suggests that in using proxy-agency, there is the potential for individuals to become over-reliant on the proxy-agent. The relationships observed between self-regulatory efficacy, proxy-efficacy and reliance support Bandura's theorizing. Specifically, higher proxy-efficacy and lower self-regulatory efficacy were found to be associated with higher levels of reliance on the exercise class instructor. Further, in predicting reliance, both self-regulatory and proxy-efficacy contributed separately to the model. However, proxy-efficacy was seen to account for the majority of the variance. This may be reflective of both the conceptual and operational correspondence found between proxy-efficacy and reliance. Specifically, proxy-efficacy concerns individuals' confidence in the instructor's ability to help them on those tasks for which they require assistance. Whereas, self-regulatory efficacy indirectly relates to reliance as a function of the self-regulatory skills assessed. Therefore, self-regulatory efficacy was seen to add significant, separate variance, although to a lesser degree than proxy-efficacy in the prediction of reliance.

### *Study Limitations*

These results underscore the importance of examining the dilemma that exists when using proxy-agency in exercise. However the limitations of this preliminary study must be recognized. One limitation is that the results observed are limited to a sample of several structured community and university-based exercise classes composed predominantly of females with a recent history of physical activity.

Another limitation concerns sample size. Whereas the finding that preferred level of proxy contact influenced individuals' confidence in their ability to self-regulate when facing a

behavioural challenge, analysis may have benefited from increased statistical power when testing for interactions. Although interaction effects were found for self-regulatory and task efficacies, the direction of the means for intention strength was also similar ( $p = .08$ ) to those observed for the significant variables.

### *Strengths of the Study*

However, the present study also had important methodological and conceptual strengths. In order to examine the effects of the exercise context on social-cognitions of those differing in preferred level of proxy-contact, a quasi-experimental design was employed. The manipulation of perceived exercise context used in this quasi-experimental design allowed for the examination of Bandura's (1997) assertion that reliance on a proxy-agent may impede the cultivation of personal efficacies.

To our knowledge, this study represents the first examination of the beliefs of individuals who may face the dilemma of proxy-agency in the exercise literature. The current evidence provides initial support for the relationships proposed by Bandura (1997), suggesting that preferring high proxy-contact may be related to a potential inability to adapt to circumstances demanding greater independence in managing exercise. These findings further our understanding of the use of proxy-agency in exercise.

However, replicating and extending these findings would strengthen the case advanced by Bandura and if supported, advance a heretofore unexplored area of exercise psychology. Furthermore, the continued study of individual social cognitions and behaviour in relation to the dilemma of proxy-agency in exercise has possible applied implications for exercise leaders as they must recognize the delicate balance between helping and hindering. It is therefore not only important to further understand the influence of individuals' preference for contact upon



exercise-related social cognitions. It is also important to extend the SCT perspective more broadly by considering affective and behavioural reactions to situations requiring different levels of exercise self-management. Finally, past experience with exercise and the perceived responsibility of the instructor may influence the level of preference to use a proxy agent. These issues were addressed in Study 2.

## Study 2

Given that a high degree of contact with a proxy-agent may limit the development of confidence in the use of self-regulatory skills and thus threaten exercise adherence, two important questions arise. First, is this preference for frequent contact with a proxy associated with individuals' perceived difficulty, satisfaction and behavioural choices when faced with a behavioural challenge? Second, what factors play a role in why people choose to frequently use proxy-agency? A brief review of the theoretical basis for these questions is instructive.

In his discussion of proxy-agency, Bandura (1997) suggests that use of proxy-agency may make it easier for individuals to achieve their desired outcomes. The assistance provided by proxy-agents helps individuals to manage aspects of behavioural performance which in turn, may make it easier to continue the pattern of behaviour. In addition to the difficulty of managing aspects of behaviour, Lent and Lopez (2002) have postulated that the use of proxy-agency is related to individuals' satisfaction and behavioural choices. Specifically, in their discussion of efficacy beliefs within helping relationships, they suggest that obtaining help from others (i.e., proxy-agents) may be associated with individuals' perceptions of satisfaction, and may have some bearing on their behavioural choices. The assistance received by a competent proxy may create a more satisfying exercise experience for the individual whereas an individual may be less satisfied with having to perform the behaviours without the proxy's assistance. Furthermore, employing the use of proxy-agency may influence the activities in which individuals choose to engage as they may not be prepared to participate in activities without the proxy.

Bandura (1997, 2001) outlines three primary reasons that lead people to choose to use proxy-agency. First, some individuals do not possess (i.e., have not developed or have lost) the means to reach their desired outcome(s) due to insufficient mastery experiences necessary for

skill development or retention. Second, people who do have the necessary skills for goal attainment often turn to a proxy-agent because they believe this person will help to facilitate achieving desired outcomes. Finally, people capable of exerting direct control over their exercise participation choose proxy-agency simply because they do not want to shoulder the responsibility of direct control over the aspects of its management and therefore allot responsibility to the proxy rather than to themselves. In each of these situations, individuals partly allow their success to rest on the competence and commitment of another person (Bandura, 1997), but at the possible expense of their own skill development. Paradoxically, while using a proxy can enable the learning of self-regulatory skills, extensive reliance on the proxy can reduce mastery opportunities and constrain the development of self-regulation of exercise. Given that a preference for a high degree of proxy contact may limit this development and thus threaten independently managed exercise adherence, it is important to determine reasons for the extent of reliance on a proxy (e.g., a need for this help; abdicating responsibility).

Therefore, the purpose of the present study is twofold. The first purpose is to *extend* Study 1 by examining the differences in additional social-cognitive and behavioural correlates characteristic of participants' differential level of preferred proxy-contact. Specifically, in addition to differences in the beliefs about self-regulatory skills examined in Study 1, the variables of (a) perceived difficulty, (b) satisfaction, (c) alternative exercise choices, and (d) the social-cognitions related to these exercise choices will also be examined. The second purpose is to explore *why* individuals who *are capable* of exerting personal control choose to use a proxy. An examination of the previous exercise experience of these participants and how they allot responsibility for exercise management to themselves and others is of interest.

## Methods

### *Participants*

Male and female volunteer participants ( $N = 56$ ) ranging in age from 19 to 65 years ( $M_{age} = 35.93$  yrs,  $SD = 12.99$ ) were recruited from structured exercise classes within community and university fitness facilities. Classes were taught by nationally certified group fitness instructors. The sample was comprised predominantly of females (90.7 %). Approximately half the sample (51.8 %) reported being single while another 39.3% reported being married. The remaining 9% were either separated or did not report marital status. The sample was highly educated with 88.9% of the sample reporting having completed at least some university. For the large majority of participants (94.5%) this was not the first time they had attended fitness classes. Participants reported attending 3 ( $M = 3.00$ ,  $SD = 1.33$ ) fitness classes per week over the past month and engaging in 2 ( $M = 2.52$ ,  $SD = 1.73$ ), 30 minute sessions of independent exercise outside of the class per week over the last month.

### *Design*

As in Study 1, a 2 between subjects (preferred proxy contact) x 2 within subjects (exercise context) mixed factorial design was used. For the between subjects condition, participants were self-categorized as to their preferred level of contact with a proxy-agent during their regular exercise (i.e., high preferred contact; low preferred contact). For the within-subjects condition (i.e., exercise class; no exercise class), the first level required participants to respond to questions concerning their *exercise class participation*. The second level of the within- subjects condition followed these responses. Participants received a description concerning a hypothetical situation where they could no longer rely on either the presence of the

instructor or the exercise class for their regular participation in exercise. They were required to answer about their independent management of their exercise.

*Preferred level of proxy contact.* For the between subjects condition, participants were self-categorized as to their preferred level of contact with a proxy-agent during their regular exercise. Specifically, participants were asked to indicate the means with which they preferred to carry out their exercise *most of the time*. Two alternatives were provided that reflected preference for amount of contact. The first option indicated a preference for planned, guided activity and frequent contact with an exercise proxy while the second outlined a preference for self-guided activity with only infrequent contact with a proxy-agent.

*Behavioural challenge manipulation of exercise context.* Exercise context constituted the within subjects factor. Participants were first exposed to questions concerning their exercise class participation. Following responses to these questions, participants then received a description concerning the hypothetical situation where participants could no longer rely on either the presence of the instructor or the exercise class for their regular participation in exercise. Specifically, participants were instructed to “answer the following sets of questions under the assumption that all available exercise classes are completely cancelled and unavailable as an exercise option.”

### *Measures*

Participants were asked two major series of questions that concerned their participation in different exercise contexts (see Appendix B). The first series of questions evoked responses with respect to their current participation within exercise classes and included measures of self-efficacy, reliance, proxy-efficacy, intentions, allotment of responsibility, perceived difficulty, and satisfaction with their exercise experience. The second series of questions were posed in

response to being presented with the behavioural challenge of exercising independently and evoked responses with respect to various social-cognitions and behavioural measures (i.e., self-efficacy, intentions, perceived difficulty, satisfaction, alternative activity preferences and their ability to design behavioural plans for regular exercise). In addition to the constructs under study, various demographic and physical activity measures were also assessed.

*Recent exercise history.* This measure concerned participants' typical weekly exercise over the past month. Specifically, participants indicated exercise over the past month by self-reporting average number of classes attended per week over the last month, and average number of exercise sessions per week outside of class over last month.

*Exercise management efficacy.* This form of self-regulatory efficacy concerned participants' ability to manage various aspects of their exercise participation over the next 4 weeks. In assessing efficacy beliefs, use of a prospective, 4-week time period is often used in the exercise literature as a time frame over which people can utilize forethought to estimate their behaviour with some degree of confidence (e.g., McAuley & Mihalko, 1998). This construct was assessed in a manner consistent with that used in Study 1. Internal consistency was found to be acceptable for both "proxy-led" ( $\alpha = .92$ ) and "independent" ( $\alpha = .96$ ) assessments (Tabachnik & Fidell, 1996).

*Exercise efficacy.* Exercise self-efficacy concerned participants' confidence in performing the aerobic, resistance and flexibility portions of an exercise program over the next 4 weeks and was measured in the same manner as in Study 1. In the present study, this measure reflected acceptable levels of internal consistency for both the "proxy-led" ( $\alpha = .86$ ) and "independent" ( $\alpha = .80$ ) assessments (Tabachnik & Fidell, 1996).

*Responsibility.* Participants allotment of responsibility for management of their exercise class participation was measured using a modified version of the Apportionment of Responsibility scale used by Gavin (1996) in studying personal trainer-client relationships. The measure used in the current study was comprised of two subscales (a) personal responsibility and (b) instructor responsibility. Each subscale was made up of the same eight items concerning specific aspects of their exercise class participation. The subscales differed in regard to the person to which they referred. The personal responsibility scale asked participants to indicate how much responsibility they felt they had in managing the specific tasks during class whereas the measure of instructor responsibility asked participants to indicate how much *the management of the same tasks were the* responsibility of the class instructor. Example items included “Establishing exercise goals for the session” and “Determining how hard the exercise session will be.” Each item was measured on a 0% (no responsibility) to 100% (complete responsibility) scale with item scores being summed and averaged to provide mean scores for both personal and instructor responsibility out of 100. Both subscales had acceptable levels of internal consistency (Personal  $\alpha = .80$ ; Instructor  $\alpha = .79$ ) according to Tabachnik and Fidell (1996).

*Exercise difficulty.* This measure concerned participants’ perceived difficulty in continuing to adhere to their current level of exercise over the next four weeks. Items were presented as a temporal ladder with each item asking about a subsequently longer time period. For example, the first item asked participants to indicate their perceived difficulty in maintaining their current level of exercise over the next week, whereas the second item asked about maintaining their current level of exercise over the next 2 weeks. Four items were used, each measured on a 1 (not at all difficult) to 10 (extremely difficult) scale. Individual item scores were summed and averaged to provide mean scores of participants’ perceived difficulty in both

the in-class and on-own exercise contexts. Calculation of Cronbach's alphas indicated high internal consistency for the measure in both contexts ("in class"  $\alpha = .99$ ; "independent"  $\alpha = .97$ ). In addition to scale reliabilities, both measures of perceived difficulty were subjected to a principal components analysis. Items were found to load on a single component for the measures in both situations with all factor loadings in excess of .84.

*Satisfaction.* Participants' satisfaction with their exercise experience was measured across five items using a 1 (very dissatisfied) to 9 (very satisfied) scale. Items concerned various components of the exercise routine that would require self-regulation. Example items were prefaced with the phrase "Given your current exercise experience, how satisfied are you with ...". This was followed by components such as "The variety of exercises available to you" and "When exercise fits into your schedule?". Internal consistency was found to be acceptable as per Tabachnik and Fidell, (1996) recommendations for both "proxy-led" ( $\alpha = .82$ ) and "independent" ( $\alpha = .89$ ) assessments. Further, principal components analyses indicated that the measure was assessing a single construct in both exercise contexts (Factor loadings  $> .70$ ).

*Reliance.* This measure was similar to that used in Study 1 and concerned participants reliance on the class instructor for assistance in managing specific aspects of their regular exercise participation over the next four weeks. The current measure differed from that used in Study 1 in that it presented participants with 12 aspects relating to managing regular exercise participation as opposed to 10 and included items relating to both in-class management and management of exercise outside of the class. Specifically, items included six tasks relating to in-class management (e.g., Motivate myself to challenge myself *in class* so the exercise is at least moderately difficult) and six tasks relating to management of exercise outside of the class setting (e.g., Motivate myself to challenge myself so that my exercise *outside of class* is at least



moderately difficult). As in Study 1, this measure required participants to first identify *what* aspects they relied upon the instructor for help, and second, to report *the extent* to which they needed the instructor's help with these tasks. For the items indicated, participants reported the degree to which they relied on the instructor using a nine-point scale (1 = "count on a minimal amount of time"; 9 = "count on most of the time"). The extent of reliance scores for the selected aspects were summed then averaged to provide an indication of the mean reliance score out of nine.

*Proxy efficacy.* This measure concerned participants' confidence in their exercise class instructor's abilities to *help them* (the exercise class participant) manage various aspects of their exercise participation over the next four weeks and was assessed in a manner similar to that used in Study 1. In order to insure that participants only provided values for those aspects with which they felt they needed help, participants only indicated proxy-efficacy for those aspects they identified for the reliance measure. Proxy-efficacy was measured on a 0 (not at all confident) to 100% (completely confident) scale with item scores being summed and averaged to provide a measure of proxy-efficacy out of 100%.

*Alternative activity choice.* This four part, multi-component measure concerned participants' preferred alternative activity in the event attending their regularly scheduled exercise was unavailable as an activity choice. It was provided to determine if participants' behavioural choices would be affected by the challenge of exercise class cancellation that was presented to participants. Specifically, items assessed participants' preferred alternative activity choice as well as their confidence, satisfaction and perceived difficulty of their choice.

Participants were first presented with five alternative activity choices, each reflecting behaviour requiring more self-regulation (e.g., "self-manage my own exercise routine" or less

self-regulation (e.g., “attempt to enrol in an exercise class at another facility”). Participants indicated which alternative would be the closest to the approach to activity they would choose to pursue over the next 4 weeks if their current exercise classes were cancelled.

For the alternative selected, participants were then asked a series of three, one-item questions. The first measure concerned participants’ confidence in their ability to pursue the chosen alternative over the next 4 weeks and was measured using a 0-100% scale. The second measure asked participants to indicate how satisfied they anticipated being with their alternative activity choice. This item was measured using a 1 (Very Dissatisfied) to 9 (Very Satisfied) scale. Finally, participants also asked about the difficulty of pursuing this choice for 4 weeks using a 1 (not at all difficult) to 10 (very difficult) scale.

*Reason for contact preference.* In addition to the between subjects categorization of preferred level of proxy-contact, the reason for this preference was also of interest. Specifically, Bandura (2001) suggests that while some individuals feel they require the assistance of a proxy, the majority of those employing proxy-agency voluntarily choose to do so because they believe it facilitates achievement of their desired outcomes. Therefore, following self-categorization, participants were asked to indicate the main reason behind their preference. Specifically, participants were asked to indicate the reason that most closely reflected their personal preference. Options that reflected varying degrees of exercise experience were provided. Participants were instructed to only respond to the list provided for the level of proxy contact they had selected.

Participants preferring frequent contact were provided with the following category specific options (a) “because I don’t have much exercise experience and I don’t feel capable of managing all of the aspects of my exercise participation” and (b) “because although I have

exercise experience, the trainer helps me to manage the difficult aspects of my exercise participation (e.g., exercise selection, motivation).” Participants indicating a preference for infrequent contact were presented with the following, category specific option: (a) “because I have exercise experience and feel capable of managing the aspects of my exercise participation on my own (e.g., exercise selection, motivation)” and (b) “because although I don’t have much exercise experience, I want to try and manage the aspects of my exercise participation on my own (e.g., exercise selection, motivation).”

### *Procedure*

Participants were recruited from structured exercise classes by a trained investigator. The investigator delivered a standardized request for volunteer participation which adhered to university research ethics guidelines for research with human subjects. Participants were provided with the purpose and procedures of the study and their anonymity was guaranteed. Whenever possible, completed questionnaires were collected by the researcher immediately following participants’ classes. Participants unable to complete the questionnaires at the time of administration were provided with two options. They could either (a) return completed questionnaires within one week to a secure drop-box located at the front desk of the respective facilities or (b) receive an electronic version of the questionnaire package administered via e-mail to be completed and returned electronically to the investigator within one week of administration. Participants were informed that, in accordance with university research ethics guidelines, e-mail addresses provided to the researcher would be used solely for the purpose of data collection for the current study, would not be shared and would be deleted following study completion.

## Results

The majority of participants were drawn from drop-in fitness classes ( $n = 43$ ) and the remainder were from registered structured exercise classes ( $n = 9$ ). MANOVAs were conducted to determine if differences existed between the participants from the two different types of classes with respect to major dependent variables. Demographic variables were examined by using multiple chi-square analyses. No significant differences or associations were found for any of the analyses. Thus, the all participants were combined for further analyses.

### *Analytic Strategy*

Data analyses were conducted in four stages. The first stage consisted of descriptive statistics for all measured variables. The second stage of analysis was conducted using a 2 (preferred proxy contact) by 2 (exercise context) mixed model MANOVA with Bonferroni corrected follow-up to examine differences in efficacy, satisfaction and perceived difficulty. This was followed by a Chi-square analysis examining whether those individuals preferring different levels of proxy contact differed in their behavioural choices when facing sudden class elimination. Then, a one-way between groups (preferred proxy contact) MANOVA was conducted to examine whether there were between group differences on the social-cognitions relating to participants' choice of alternate activity.

The third stage included analyses conducted to examine why individuals choose to use a proxy to help them. A one-way, between groups MANOVA was conducted to examine whether participants who differed in their preferred level of contact with a proxy differed in their exercise history, and the responsibility they allotted to themselves and to the class instructor for the management of in-class tasks. This was followed by a logistic regression to determine if exercise history and allotted responsibility predicted participants' preferred level of contact.

Finally, the fourth stage involved conducting the analyses presented in Study 1 in order to further examine the support for the relationships between proxy-efficacy, self-efficacy and reliance on proxy-agents. Specifically, a one-way MANOVA was used to examine potential differences in self-regulatory and proxy-efficacy across high and low reliance groups. This was followed by a hierarchical regression predicting reliance on the instructor.

### *Descriptives*

Descriptive statistics indicated that participants were efficacious about their ability to manage their regular exercise participation ( $M = 74.82$ ,  $SD = 19.64$ ) as well as the class instructor's ability to help them manage their exercise participation ( $M = 77.26$ ,  $SD = 15.32$ ; 0-100% scale). Participants reported being highly satisfied with their exercise class experience ( $M = 7.25$ ,  $SD = 1.13$ ; 1-9 scale) and perceived little difficulty in continuing to exercise at their current level ( $M = 2.20$ ,  $SD = 1.79$ ; 1-10 scale). Finally, participants reported relying on their class instructor for help with an average of six aspects of managing their exercise participation ( $M = 5.93$ ,  $SD = 3.06$ ) and reported relying on the instructor more than half the time ( $M = 5.79$ ,  $SD = 1.58$ ; 1-9 scale).

### *Level of Preferred Contact by Exercise Context Comparisons*

*Classification of participants to preferred level of proxy-contact.* Recall that the design of the study was a 2 by 2 mixed model factorial. Participants self-selected to either a high contact preference group ( $n = 39$ ) or a low contact preference group ( $n = 15$ ). This dichotomous classification was used as the between subjects factor. The within subjects factor used in the mixed-model analysis was exercise context. This factor had two levels; exercise with a proxy-led class and exercise without the proxy-led class<sup>1</sup>.

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<sup>1</sup> Prior to conducting analyses concerning social-cognitions and behavioural choice, a one-way MANOVA was conducted to examine the possibility of group differences across age and total months participating in exercise

*Social-Cognitive and Affective Differences.*

A 2 (preferred contact) by 2 (exercise context) mixed model MANOVA was conducted and a number of significant multivariate effects were found. As recommended for smaller samples with unequal N's, Box's M test was examined to assess the assumption of homogeneity of variance-covariance (cf. Tabachnick & Fidell, 1996). Examination of Box's M test indicated the assumption of homogeneity of variance-covariance was met and interpretation of the results could proceed.

*High and low preferred proxy-contact.* A significant multivariate between subjects main effect was found for preferred level of contact (Wilks'  $\lambda = .768$ ,  $F(4, 49) = 3.69$ ,  $p = .011$ , observed power = .850). Univariate F-tests indicated that those who preferred a higher level of contact with an exercise proxy reported higher perceived difficulty ( $M_{High} = 4.15$  vs.  $M_{Low} = 2.55$ ,  $F(1) = 9.03$ ,  $p = .004$ ,  $\eta^2 = .15$ ) and appeared to report lower self-regulatory efficacy ( $M_{High} = 64.78$  vs.  $M_{Low} = 76.85$ ,  $F(1) = 3.94$ ,  $p = .052$ ,  $\eta^2 = .07$ ) than those participants preferring a low level of proxy contact.

*Exercise context.* A significant multivariate within subjects main effect was found for context (Wilks'  $\lambda = .496$ ,  $F(4, 49) = 12.47$ ,  $p < .001$ , observed power = 1.00). Univariate F-tests indicated that participants had lower self-regulatory efficacy, lower task efficacy, reported higher perceived difficulty and less satisfaction with their exercise experience when they were faced with the behavioural challenge of exercising independently as compared to exercising in proxy-led exercise conditions (see Table 3).

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classes. No significant differences were found between the high preferred and low preferred contact groups (Wilks'  $\lambda = .977$ ,  $F(2, 44) = 0.513$ ,  $p = .602$ ).

Table 3

*Study 2 Main Effects for Exercise Context*

|                          | Normal | Challenge | $\eta^2$ | p.   |
|--------------------------|--------|-----------|----------|------|
| Self-regulatory efficacy | 75.21  | 66.43     | .16      | .003 |
| Task efficacy            | 80.94  | 61.22     | .40      | .001 |
| Perceived difficulty     | 2.16   | 4.53      | .34      | .001 |
| Satisfaction             | 7.24   | 5.89      | .27      | .001 |

*Note.* Efficacy 0 - 100% scales, Difficulty 1-10 scale, Satisfaction 1-9 scale

*Contact preference by exercise context interactions.* However, these main effects were superseded by a significant preferred contact by exercise context interaction (Wilks'  $\lambda = .771$ ,  $F(4, 49) = 3.64$ ,  $p = .011$ , observed power = .844). Subsequent univariate F-tests revealed that the interaction was significant for both self-regulatory efficacy ( $F(1) = 7.25$ ,  $p = .010$ ,  $\eta^2 = .12$ ) and perceived difficulty ( $F(1) = 8.29$ ,  $p = .006$ ,  $\eta^2 = .14$ ).

Post-hoc Bonferroni corrected tests for the interactive effect on self-regulatory efficacy showed that participants preferring a higher level of contact with an exercise proxy were significantly *less efficacious* in the behavioural challenge exercise context. Specifically, the self-regulatory efficacy reported by high contact participants when facing a behavioural challenge ( $M_{HI-BC} = 56.57$ ) was significantly lower than that reported by low contact participants ( $M_{LO-BC} = 76.29$ ). As well, the self-regulatory efficacy of high contact participants in the behavioural challenge condition was also significantly lower as compared to the confidence these high contact participants reported in proxy-led conditions ( $M_{HI-NORM} = 73.00$ ) and than the self-regulatory efficacy of low contact participants in the proxy-led condition ( $M_{LO-NORM} = 77.42$ ,  $ps < .05$ ).

Post-hoc Bonferroni tests conducted to examine the nature of the interaction for perceived difficulty revealed the same pattern as was seen for self-regulatory efficacy (Figure 2). Specifically, high contact participants reported higher perceived difficulty when facing the behavioural challenge of independent exercise than low contact participants ( $M_{HI-BC} = 5.99$  versus  $M_{LO-BC} = 3.08$ ,  $p < .05$ ). High contact participants also reported greater difficulty in the behavioural challenge context than either high or low contact participants for the proxy-led exercise condition ( $M_{HI-NORM} = 2.31$ ,  $M_{LO-NORM} = 2.02$ ,  $p < .05$ ).

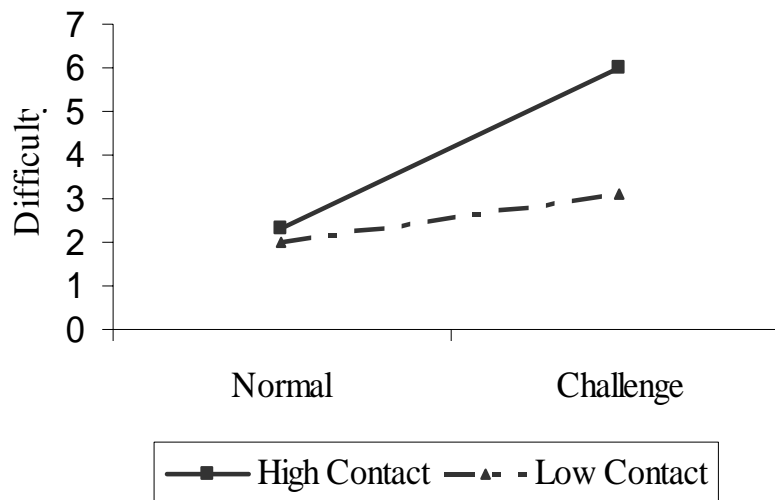


Figure 2. Study 2 contact by context interaction for perceived difficulty  
*Alternative Activity Response to Behavioural Challenge.*

Chi-square analysis was used to examine the behavioural choices made by participants differing in preferred level of proxy contact when faced with class cancellation. The chi-square analysis revealed a significant association between preferred level of proxy contact and whether or not the alternative activity chosen involved contact with another proxy ( $\chi^2(1) = 3.87$ ,  $p = .049$ ). Specifically, 80% of those preferring low contact with a proxy chose to self-manage their



own activity in the face of class cancellation whereas only 51.4% of those preferring high proxy contact chose self-management.

A one-way between proxy-contact groups MANOVA was then conducted to examine differences in efficacy beliefs, perceived difficulty and perceived satisfaction relating to the behavioural choices participants made in lieu of their cancelled class. The overall MANOVA was significant (Wilks'  $\lambda = .791$ ,  $F(3, 50) = 4.40$ ,  $p = .008$ ). Univariate F tests revealed that those who preferred high contact with a proxy-agent had lower self-efficacy in carrying out their chosen alternative activity ( $M_{HI} = 72.95$  vs.  $M_{LO} = 84.41$ ,  $F(1) = 4.57$ ,  $p = .037$ ,  $\eta^2 = .081$ ) and lower perceived satisfaction expected from this activity ( $M_{HI} = 5.36$  vs.  $M_{LO} = 6.60$ ,  $F = 5.84$ ,  $p = .019$ ,  $\eta^2 = .10$ ) than their low contact counterparts. High proxy contact participants also perceived that carrying out their chosen alternative activity would be more difficult ( $M_{HI} = 5.72$ ) than their low contact counterparts ( $M_{LO} = 3.47$ ,  $F = 10.60$ ,  $p = .002$ ,  $\eta^2 = .169$ ).

#### *Reasons for Preferred Level of Contact*

A frequency analysis of the reasons given by those preferring high proxy contact revealed that 81% specified that their preference for high contact was due to the fact that they saw the use of proxy-agency as a means to help them in achieving their goals more easily.

To investigate Bandura's postulations that the use of proxy-agency may be due to a lack of resources or a desire to avoid personal responsibility, differences in recent exercise history, allotment of responsibility and self-efficacy were examined across participants preferring frequent ( $n = 39$ ) and those preferring infrequent ( $n = 15$ ) proxy contact using a one-way between groups MANOVA.

The overall MANOVA was significant (Wilks'  $\lambda = .752$ ,  $F(4, 49) = 4.04$ ,  $p = .007$ ). Subsequent univariate F tests revealed that those who preferred frequent contact with a proxy-

agent had exercised on their own, away from the exercise class less frequently ( $M = 2.08$ ) than those who preferred infrequent contact with a proxy ( $M = 3.40$ ,  $F(1) = 7.82$ ,  $p = .007$ ,  $\eta^2 = .13$ ). It was also shown that those who preferred frequent contact allotted more responsibility to the instructor for the management of aspects of their in-class participation ( $M = 64.67$ ) than did those participants preferring infrequent contact ( $M = 55.52$ ,  $F(1) = 4.92$ ,  $p = .031$ ,  $\eta^2 = .09$ ). Finally, there was a trend indicating that those who preferred frequent contact with a proxy appeared to take less personal responsibility ( $M = 67.39$ ) than those participants preferring infrequent contact ( $M = 76.08$ ,  $F(1) = 3.75$ ,  $p = .058$ ,  $\eta^2 = .07$ ).

*Prediction of preferred proxy-contact.* Logistic regression was used to determine the relative contribution of both previous independent exercise and instructor responsibility in predicting participants' preferred level of proxy contact. As previous independent exercise provided mastery experiences prior to the assessment of contact preference, this was entered in the first block of the model whereas instructor responsibility was entered on the second block of the model.

The model correctly classified 77.8% of the participants and additively accounted for 17% of the variance in preferred level of proxy-contact (Cox Snell  $R^2 = .169$ ,  $p = .007$ ) with previous independent exercise accounting for the majority of the variance. Specifically, when entered first, independent exercise accounted for 12% of the variance ( $R^2 = .124$ , Block 1  $p = .008$ ).

#### *Relationships Between Self-Efficacy, Proxy-Efficacy and Reliance*

*Reliance on the proxy.* An extreme groups comparison was used to examine if social-cognitive differences existed between participants who differed in their level of reliance. A tertile split procedure provided two extreme groups—a highly reliant group ( $M = 7.59$ ,  $n = 18$ )

and a moderately reliant group ( $M = 3.93, n = 17$ ). These groups were shown to be significantly different on level of reliance ( $t(33) = 16.85, p = .001$ ). Thus further analysis could proceed. A one-way between groups MANOVA was used to assess differences in self-efficacy and proxy-efficacy across the extreme groups of high and low reliance. The overall MANOVA was significant (Wilks'  $\lambda = .724, F(2, 32) = 6.09, p = .006$ , observed power = .855). Univariate F tests revealed that those who were highly reliant had higher proxy-efficacy ( $M = 86.02$ ) than those who were moderately reliant ( $M = 69.43, F(1) = 10.99, p = .002, \eta^2 = .25$ ). However, no significant group differences on self-regulatory efficacy were found in the current sample.

*Prediction of reliance.* Hierarchical multiple regression analysis was used to determine the strength of the relationship between reliance on the instructor and self- and proxy-efficacy. Self-efficacy was entered on the first block with proxy-efficacy being entered on the second block of the regression equation. Self-efficacy and proxy-efficacy were again shown to be additive predictors of reliance with the overall model accounting for a significant, but modest 8% of the total variance in reliance on the instructor ( $R^2_{Adj} = .083, p = .037$ ). In the current analysis, self-efficacy did not account for a significant amount of the variance ( $p = .747$ ). However, proxy-efficacy was shown to be a significant predictor ( $R^2_{\Delta} = .115, p = .011$ ). The standardized Betas indicated that proxy-efficacy was again, positively related to reliance on the instructor ( $\beta = .343, p = .011$ ).

### *Summary of Results*

In summary, a number of significant multivariate effects were observed which offer support for Bandura's theorizing of proxy-agency as outlined in Social Cognitive Theory. The most interesting of which was the preferred contact by exercise context interactions for both self-regulatory efficacy and perceived difficulty. Participants preferring high contact with an

exercise proxy reported lower self-regulatory and higher perceived difficulty in the behavioural challenge context of independent exercise. In addition to the significant interactions, a number of significant main effects for preferred level of contact and exercise context were observed. Participants preferring high proxy-contact reported lower levels of self-efficacy and higher levels of perceived difficulty, and all participants reported lower self-regulatory efficacy, lower task efficacy, higher perceived difficulty and less satisfaction when forced to consider exercise without their proxy.

Chi-square analysis revealed that those preferring high proxy-contact were less likely to choose to self-manage their exercise in the face of class cancellation. In addition, a MANOVA showed that high-contact participants perceived pursuing an alternate activity as more difficult and reported being less confident in, and less satisfied with their chosen activity alternative.

In examining the reasons as to why participants prefer high or low proxy-contact, MANOVA and regression analyses found that preferring high proxy-contact was associated with less independent exercise experience and allotting greater responsibility to the instructor rather than to oneself.

Finally, MANOVA and regression analyses replicated the positive relationship between proxy-efficacy and reliance on the class instructor as presented in Study 1. Specifically, higher proxy-efficacy was associated with greater reliance on the exercise class instructor.

## Discussion

Study 1 results provided an initial examination of the dilemma of proxy-agency in exercise. The current results extended the initial findings of Study 1 suggesting further support for Bandura's theorizing on proxy-agency. The results suggest that individuals preferring to use a proxy-agent more often find independent exercise more difficult and are not prepared to

manage their own independent activity. The relationships observed also provide preliminary evidence that the choice to use a proxy-agent is related to independent exercise experience and the allotment of responsibility.

Bandura (1997) states that the use of proxy-agency can foster a sense of reliance on the proxy and impede the development of personal competencies. Further, Bandura (2001) notes that personal control is not universally desired as it can require a great deal of effort and is accompanied with the onerous responsibility of self-management. In light of this, Bandura (1997, 2001) suggests that people often surrender control to proxy-agents so as that achievement of goals will be easier and to free themselves of the responsibility of personal control. The current results provide preliminary support for each of these postulations.

First, the results extended the findings of Study 1, suggesting that frequent use of a proxy-agent is associated with not only self-regulatory beliefs but also various other social-cognitions, affect and behavioural choices. This was supported by multiple, significant analyses. Specifically, those who prefer high proxy-contact appear to be less well equipped to deal with a behavioural challenge as they reported lower self-regulatory efficacy and higher perceived difficulty than those who preferred low proxy-contact. It was also found that the majority of those preferring high proxy-contact were not prepared to self-manage their exercise if classes were cancelled and reported being less confident and less satisfied with their own chosen activity alternative. High-contact participants also view the pursuit of an alternative activity as more difficult than those who preferred low proxy-contact. These findings are in keeping with Bandura's notion that use of proxy agency may make it easier for individuals to manage their exercise participation.

Second, the current results speak to the primary reasons as to why people employ proxy-agency as outlined by Bandura (1997). Bandura states that the use of proxy-agency is primarily due to one (or more) of three reasons: (a) individuals often feel it is easier to achieve their outcomes with the help of a proxy, (b) individuals perceive a lack of personal resources or experience, or (c) individuals do not want to shoulder the responsibility of having to self-regulate. The current data appear to offer some support for Bandura's assertions, as it was shown that there are significant relationships between a preference for high proxy-contact and both previous independent exercise experience and allotment of responsibility for exercise management. Participants preferring high proxy-contact reported less independent exercise experience and were found to allot more responsibility for the management of their in-class participation to the class instructor. It should be noted that although the examination of the personal responsibility did not reach the traditional level of statistical significance (i.e.,  $p = .05$ ), this pattern of means supports Bandura's theorizing. Therefore, future investigations examining the use of proxy-agency may benefit from increased statistical power. It is also suggested that future research examine additional reasons for preferring high or low proxy contact. Specifically, it is appropriate to point out that the effect sizes for both independent exercise and instructor responsibility as predictors would be described as small to moderate (cf. Cohen, 1992). Thus, in this preliminary study, a more concise interpretation is that preferred proxy contact is *one indication* of the use of proxy-agency and may not reflect all of the complexities of the choice to employ proxy-agency in exercise. Further, assessments of previous exercise experience and allotment of responsibility may not represent all of the reasons for needing a proxy-agent as outlined by Bandura (1997). Thus, future research may benefit from the continued examination and measurement of potential reasons for the use of proxy-agency in

exercise. Specifically, it may prove useful to tap a variety of reasons for why participants use proxy-agency using an open-ended, qualitative approach to determine the breadth of reasons provided by part and if they correspond to those theorized by Bandura (1997). Readers should be cautioned, however, to differentiate asking about proxy-agency, defined as helping others, versus choosing an instructor simply on the basis of favorable instructor characteristics. Using the conceptual underpinning outlined in this thesis, it is argued that the latter characteristics do not define proxy-agency. These latter characteristics may, however, may be related to aspects of proxy-contact.

Finally, the current results provided partial replication for the findings of Study 1 and provide further support of the positive proxy-efficacy—reliance relationship (Bandura, 1997). It appears that participants higher in proxy-efficacy consistently rely on their instructor to a greater extent (i.e., more frequently) as compared to those with lower proxy-efficacy. While the positive relationship between proxy-efficacy and reliance observed in Study 1 was replicated in the current study, the previously observed relationship between self-regulatory efficacy and reliance was not found. This may be due, in part to the increased operational correspondence between proxy-efficacy and reliance in the current study.

Continued research into the reasons individuals choose to relinquish their personal control to a proxy will provide insight into the influence of proxies (e.g., exercise class instructors) on the exercise-related cognitions and activity choices of those who rely on them. Results may also help provide evidence of the homo- or heterogeneity of the characteristics of exercise class participants, thus allowing for more effective intervention and program design. Furthermore, understanding how participant perceptions of the proxy-agent influence the choice to exert (or not) personal control in exercise situations has practical value for the proxy-agents.

Specifically, it may help to direct proxy-agents' efforts at promoting the well-being and personal development of these individuals (Lent & Lopez, 2002). Examining the relationship between participants' perceptions of the proxy-individual interaction and preferred level of proxy-contact was the primary focus of Study 3.



### Study 3

In his theorizing on proxy-agency, Bandura (2001) suggests that the use of a proxy-agent may help to facilitate the development of important self-regulatory skills. However, he outlines that over-reliance on the assistance of a proxy-agent may lead to self-induced dependencies which actually inhibit the development of the skills needed for independent self-regulation. Evidence from studies 1 and 2 provide preliminary evidence of the social-cognitive aspects of this dilemma. Participants who preferred to be in frequent contact with a proxy-agent while exercising, were seemingly unprepared, from a social-cognitive belief standpoint, when they faced the behavioural challenge of exercising independently.

The first two studies of this dissertation have specifically examined proxy-efficacy as the key efficacy construct relevant in the proxy-agency relationship. Although these studies have provided new perspectives about studying proxy-efficacy in exercise, research from the social-psychological literature suggests that there may be other efficacy constructs relevant to proxy-agency that are worthy of attention (cf., Lent & Lopez, 2002). Specifically, Lent and Lopez (2002) outline additional efficacy constructs that concern the nature of the proxy - participant relationship and proxy agency. Examining these additional social-cognitive constructs and the relationships between them may provide new information and conceptual clarification regarding proxy-agency in exercise. The examination of these constructs provides opportunity to determine if these constructs are sufficiently empirically independent of one another to merit their own research (e.g., is proxy efficacy distinct from “other efficacy”). Further, it allows for the examination of the relationships between these constructs and those already outlined in social-cognitive theory (e.g., self-efficacy, intentions, attributions: Bandura, 1986, 1997, 2001). A brief review of the suggestions presented by Lent and Lopez (2002) is instructive.

*Lent and Lopez's Tripartite View of Efficacy Beliefs in Proxy Agency*

Lent and Lopez (2002) suggest that where successful performance requires the efforts of both the individual and the proxy-agent, understanding an individual's beliefs about both parties in the relationship may be important. Specifically, they present a preliminary view of relational efficacy beliefs referring to "the network of interpersonal or interactive efficacy beliefs about the self and the other within the context of a particular relationship" (p. 257: Lent & Lopez, 2002). In addition to self-efficacy, Lent and Lopez present two other efficacy-constructs which they feel are important in understanding interpersonal contexts, (a) other-efficacy, and (b) relation inferred self-efficacy (RISE) beliefs.

Other-efficacy is defined as "an individual's beliefs about his or her significant other's ability to perform particular behaviours" (p. 264: Lent & Lopez, 2002). Within an exercise context, an example of an exercise class participant's other-efficacy is confidence in their class instructor's ability to provide a variety of exercises within the class. Lent and Lopez (2002) suggest that other-efficacy may be related to (a) self-efficacy, (b) reliance on the proxy's feedback (c) relationship satisfaction and (d) effort expended. Specifically, individuals having higher confidence in their proxy to perform certain tasks will feel more confident themselves, may be more reliant on the proxy, be more satisfied with the proxy-agency situation and will expend more effort when operating with the help of the proxy. In addition, other-efficacy is thought to be positively related to RISE beliefs.

Lent and Lopez define RISE beliefs as an individual's appraisals of how another person views the competence of that same individual. For example, an exercise class participant may perceive that the instructor is not confident in that same participant's ability to self-monitor his or her own exercise progress. RISE beliefs are thought to be an additional source of information

to be used by individuals in the development of their self-efficacy. Lent and Lopez (2002) also suggest that RISE beliefs are positively related to satisfaction and are thought to be associated with the nature of attributions individuals make about their performance. Specifically, Lent and Lopez postulate that if individuals are provided with feedback from their proxy that suggests that they are capable of performing successfully, those individuals will make more stable and internal causal attributions.

Lent and Lopez's (2002) view of relational efficacy beliefs provides a useful extension to Bandura's (1997) theorizing on proxy-agency. However, Lent and Lopez (2002) do not specifically include proxy-efficacy (one's confidence in a proxy-agent's abilities *to help the individual* perform the task and/or self-regulatory behaviours) in their discussion of relational efficacy beliefs. The evidence presented in Studies 1 and 2 demonstrates that proxy-efficacy *is* an important efficacy construct in the study of proxy-agency as the notion of the help provided by the proxy is an essential element to the proxy - individual relationship.

While Lent and Lopez (2002) do not provide extensive empirical support for the importance of other-efficacy and RISE beliefs, exercise is an area that may provide the opportunity to demonstrate and differentiate these constructs. Understanding the unique contributions of each of these efficacy beliefs to the proxy - individual relationship can only be accomplished through studying them in concert, thus providing a more complete examination of proxy-agency from a theoretical viewpoint. Therefore, the overall purpose of the present study was to clarify and extend the study of the perceptions relevant to the proxy - individual relationship within an exercise context. To this end, the present study had three aims. The first aim was to examine the associations between relational efficacies (proxy-efficacy, other-efficacy, RISE beliefs) and to determine the relative importance of these efficacy beliefs as

correlates of self-efficacy, reliance, satisfaction and effort within a proxy-led exercise situation. The second aim was to examine those differing in RISE beliefs as they may also differ in the nature of their causal attributions (cf. Lent & Lopez, 2002). The third aim was to continue to examine the proxy-agency dilemma by considering the reliability of the identified differences observed for different levels of preferred proxy contact.

## Methods

### *Participants and Design*

Seventy-nine participants ( $M_{age} = 30.30$  years,  $SD = 11.59$ ) were recruited from structured exercise classes from within both community and university fitness facilities. All instructors held nationally recognized certification for teaching group fitness. As was the case for the samples taken from fitness classes in the two previous studies, the current sample was comprised primarily of females (93.6%). On average, participants reported attending three ( $M = 3.09$ ,  $SD = 1.80$ ) classes per week over the past month and engaging in two ( $M = 2.20$ ,  $SD = 1.81$ ), 30 minute sessions of independent exercise outside of the class per week over the last month. Consistent with Studies 1 and 2, a mixed model design was used with the between subjects factor being preferred level of proxy contact and the within subjects factor being exercise context.

*Preferred level of proxy contact.* Grouping of participants to the between subjects condition was accomplished using the same self-categorization procedure as in Study 2. Participants self-assigned as to their preference for either high ( $n = 64$ ) or low ( $n = 12$ ) contact with a proxy-agent.

*Behavioural challenge manipulation of exercise context* As in Studies 1 and 2, participants completed two series of measures. The first concerned their exercise class

participation while the second concerned a hypothetical behavioural challenge scenario of sudden class cancellation.

### *Measures*

Consistent with the within-subjects aspect of the design, participants were asked two major series of questions that concerned their participation in different exercise contexts (see Appendix C). The first series of questions evoked responses with respect to their self-efficacy, intentions, and satisfaction given their current participation in exercise classes. The second series of questions evoked responses with respect to these social-cognitions after being presented with the behavioural challenge of exercising independently (described below).

*Exercise management efficacy.* This form of self-regulatory efficacy was assessed using an 8-item measure consistent with that used in Study 2. Items were assessed on a 0 - 100% scale. Item scores were then summed and averaged to provide a mean value of exercise management efficacy. Internal consistency was found to be acceptable for both “proxy-led” ( $\alpha = .93$ ) and “independent” ( $\alpha = .95$ ) assessments.

*Exercise efficacy.* Exercise efficacy was assessed using a 3-item measure consistent with that used in Study 2. Items were assessed across a standard, 0 - 100% efficacy scale and then were summed and averaged. The internal consistency was calculated for the present study and was found to be satisfactory for both the “proxy-led” ( $\alpha = .95$ ) and “independent” ( $\alpha = .86$ ) assessments (Tabachnik & Fidell, 1996).

*Satisfaction.* Participants’ satisfaction with their current exercise experience was assessed using a 5 item measure in a manner consistent with that used in Study 2. Internal consistencies for this measure were found to be adequate (Tabachnick & Fidell, 1996) in the current study (“proxy-led”  $\alpha = .88$ ; “independent”  $\alpha = .90$ ).

*Reliance.* Reliance was measured using the same procedure as described in Study 2. Participants indicated the aspects of exercise on which their class instructor's assistance was counted upon. They then indicated the degree to which they relied on the instructor assistance for each task indicated using a nine-point scale (1 = "count on a minimal amount of time"; 9 = "count on most of the time"). Mean reliance scores out of nine were then calculated by summing and averaging the individual item scores.

*Proxy efficacy.* Proxy-efficacy was assessed in a manner consistent with Study 2. Participants first indicated the aspects of their participation on which their class instructor's assistance was counted upon. For the items indicated, participants then reported their confidence in their instructor's ability to help them manage these salient aspects of their exercise participation using a 0 - 100% efficacy scale. Items were then summed and averaged to provide a mean proxy-efficacy value.

*Instructor efficacy.* In the current study, the construct of other-efficacy was operationalized as instructor efficacy and was captured using the Proxy Efficacy Exercise Questionnaire developed by Bray et al. (2004). This 17-item instrument assesses participants' confidence in their instructor's ability to perform specific skills in leading a structured exercise class across two subscales and is referred to as a measure of Instructor-efficacy. The first subscale is comprised of 14-items concerning a variety of skills performed by the instructor to motivate class participants and to teach participants appropriate technique. This subscale is therefore called "instructional-motivational." As an example, item participants were asked to indicate their confidence in their instructor to "Teach the cardiovascular part of class so that I am breathing hard continuously." The second subscale contains 3-items that assess participants' confidence in the instructor's ability to appropriately choreograph the exercise moves throughout

the class and is therefore called the “exercise choreography” subscale. As an example item, participants were asked about their confidence in their instructor’s ability to “Vary the routines from class to class.” Items were scored using a 0% (Not at all confident) to 100% (Completely confident). Individual items were then summed and averaged to provide mean confidence scores for each subscale as well as an overall, average summary score. Internal consistencies for each subscale and the overall scale were calculated ( $\alpha_{\text{overall}} = .92$ ,  $\alpha_{\text{choreo}} = .86$ ,  $\alpha_{\text{inst-mot}} = .92$ ) and were satisfactory (Tabachnick & Fidell, 1996).

*Relationally inferred self-efficacy (RISE) beliefs.* This measure was developed based on the construct of relationally inferred self-efficacy beliefs as described by Lent and Lopez (2002). This 4-item measure concerned participants’ perceptions of how much confidence the instructor had in the ability of the participant to perform a variety of self-regulatory behaviours relating to exercise participation. Items were preceded by the statement “I believe my class instructor is \_\_\_\_ confident that I can \_\_\_\_ over the next 4 weeks.” As an example item, participants were asked about their perceptions of how much confidence the instructor had in the individuals’ ability to “Monitor and regulate the intensity of my exercise during each exercise session.” This construct was assessed using a standard 0% (Not at all confident) to 100% (Completely confident) efficacy scale. Item scores were summed and averaged to provide a mean RISE score. The internal consistency of this measure was satisfactory ( $\alpha = .89$ ; Tabachnick & Fidell, 1996). Principal components analysis with varimax rotation was also conducted, revealing that all items loaded on one factor (Factor loadings .86-.89).

*Exercise intentions-behaviour.* Intention was assessed as a behavioural self-prediction (cf. Fishbein & Stasson, 1990) and included measures of (a) intended frequency of exercise, and

(b) strength of these intentions (1 - 9 scale). Items pertaining to frequency and strength of intention were identical to those used in Study 1.

*Exercise intentions-intensity* Lent and Lopez (2002) have suggested that both other-efficacy and RISE beliefs are associated with effort expended within a proxy-agency situation. In order to gather more information about effort, intensity was examined in addition to intended behaviour. Participants were asked to report the average intensity at which they intended to exercise during their exercise sessions over the course of the next 4 weeks. They rated their intended intensity using the Ratings of Perceived Exertion (RPE) scale (Borg, 1998). The RPE measure instructs participants to use a 14-point likert scale ranging from 6 (very, very light) to 20 (very, very hard) to estimate the intensity of their exercise. Intensity is part of the instruction received by participants during exercise so that they can monitor and adjust their rate of cardiovascular and/or muscular work. The RPE scale is also frequently used by exercise leaders as a meaningful teaching device in classes to guide participants' in-class effort. Participants could self-monitor and adjust this dimension of exercise or they could also depend on the proxy for guidance in this regard. This scale has been cited as a valid and reliable measure of perceptual intensity and has demonstrated acceptable reliability coefficients in previous exercise research (cf. Noble & Noble, 1998:  $\alpha$  range .71 - .90).

*Causal attributions.* The nature of the attributions made by participants concerning their exercise performance was assessed using the revised Causal Dimension Scale (CDS II: McAuley, Duncan, & Russell, 1992). Participants were first asked to respond to whether they perceived themselves to be succeeding or failing in managing their own exercise over the past month. Following this response they were then instructed to follow the CDS II procedure as follows. Participants first provided the primary reason for their self-designated exercise success



or failure. Participants then characterized these attributions according to the main CDS subscales: (a) locus of causality, (b) personal control, (c) external control and (d) stability. Responses were made on a 1 to 9 Likert scale. Thus, attributions are scaled by the respondent as follows using the locus of causality as an example (1 = reflects an aspect of the situation; 9 = reflects an aspect of yourself). Subscale scores are then calculated and range from 3-27 with higher scores indicating attributions that are characterized as internal, personally controllable, controllable by others, and stable. All four subscales showed satisfactory internal consistency ( $\alpha$ 's range = .82 to .87: Tabachnick & Fidell, 1996).

### *Procedure*

Participants were recruited from structured exercise classes in the same manner as in Studies 1 and 2. All participation was voluntary and recruitment protocol adhered to university research ethics guidelines for research with human subjects. Participants volunteering for the study did so by providing their e-mail address to the investigator. Interested participants were then sent an electronic copy of the questionnaire package including an informed consent letter. Receipt of the study material did not obligate participants to continue as they could withdraw at any time. Those completing the questionnaires sent them directly back to the investigator via e-mail within a week of administration. Upon receipt of the completed material, an electronic feedback letter was provided to the participants (See Appendix D).

## Results

### *Analytic Strategy*

Data analyses were conducted in four stages. The first stage consisted of descriptive statistics for all measured variables. In the second stage, multiple analyses were performed to examine whether the relational efficacies represented different constructs and to investigate their

correlation with relevant social-cognitive and behavioural constructs. This was accomplished using bivariate correlations followed by multiple hierarchical regressions predicting self-efficacy, satisfaction, intended effort, and reliance. Order of entry into the hierarchical regression models was determined based on existing theoretical rationale as well as previously observed empirical findings in the exercise literature. Specifically, relationships which were theoretically based and supported by existing empirical evidence were tested first. It is recognized that a hierarchical regression modelling approach can be more conservative and should be used with caution in initial studies on the basis that important relationships may be overlooked. However, the current approach not only accounted for the relationships already supported by theory and empirical evidence but allowed for the identification of *additional* constructs that may be related to the use of proxy-agency in exercise.

The third stage of analysis was conducted to examine Lent and Lopez's (2002) suggestion that those differing in RISE beliefs would also differ in the nature of their causal attributions. To accomplish this, a one-way, extreme RISE groups MANOVA was conducted.

The fourth stage of analysis was conducted to further examine the relationships presented in Studies 1 and 2. Analyses included mixed model MANOVAs conducted to examine whether there are differences in social-cognitions, affective perceptions and intentions between high-contact and low-contact individuals both within and outside a proxy-led exercise context.

### *Descriptives*

Descriptive statistics indicated that participants were efficacious about their ability to manage their regular exercise participation ( $M = 72.41$ ,  $SD = 20.29$ ) and felt that their class instructor was also confident in them (i.e., RISE beliefs:  $M = 72.50$ ,  $SD = 19.12$ ). Participants were also confident in their class instructor's ability to help them manage their exercise

participation ( $M = 74.97$ ,  $SD = 15.88$ ) and in their instructor's ability to lead the exercise class ( $M = 80.83$ ,  $SD = 10.84$ ). Participants reported relying on their class instructor more than half the time ( $M = 6.09$ ,  $SD = 1.94$ ) for help with an average of five tasks ( $M = 5.22$ ,  $SD = 3.72$ ). Finally, participants attributed their exercise success or failure to relatively internal ( $M = 21.49$ ,  $SD = 5.35$ ), personally controllable ( $M = 21.95$ ,  $SD = 4.90$ ) and stable ( $M = 17.92$ ,  $SD = 6.24$ ) factors (attributions on 3 - 27 scale). For full descriptive statistics, see Appendix E.

*Differentiation of Proxy-Efficacy, Instructor Efficacy, RISE beliefs*

*Correlations between relational efficacies.* To examine the association between efficacy variables, bivariate correlations were calculated. The correlation matrix is presented in Table 4. As can be seen, all of the efficacy variables were significantly but moderately correlated ( $r_s = .24 - .57$ ,  $p_s < .05$ ). There was no multicollinearity present ( $r_s > .90$ : Tabachnick & Fidell, 1996). In sum, the constructs appear to be moderately related but assess relatively unique concepts.

Table 4

*Correlation Matrix for Relational Efficacies*

| Variable                        | 1     | 2     | 3     | 4  |
|---------------------------------|-------|-------|-------|----|
| 1. Exercise Management efficacy | --    |       |       |    |
| 2. Proxy-efficacy               | .24*  | --    |       |    |
| 3. Instructor-efficacy          | .47** | .45** | --    |    |
| 4. RISE beliefs                 | .57** | .36** | .50** | -- |

Note. \*  $p < .05$  \*\*  $p < .01$

*Prediction of in-class self-regulatory efficacy.* Hierarchical multiple regression analysis was used to determine the strength of the relationship between the participants' relational efficacy cognitions (i.e., proxy-efficacy, RISE beliefs, instructor-efficacy) and participants' self-

regulatory efficacy. Previous research by Bray et al., (2001) has supported a relationship between instructor-efficacy and self-efficacy and therefore the former was entered on the first block. Lent and Lopez (2002) have suggested that RISE beliefs are a potential source of self-efficacy and therefore these were entered on the second block. As proxy-efficacy has yet to be shown to have a relationship with self-regulatory efficacy, it was entered as the third block of the regression equation.

The overall model was significant, accounting for 34% of the total variance in self-regulatory efficacy ( $R^2_{Adj.} = .336, p < .001$ ). Instructor-efficacy accounted for 21% of the variance ( $R^2\Delta = .210, p < .001$ ) with RISE beliefs adding an additional 15% ( $R^2\Delta = .151, p < .001$ ). Proxy-efficacy did not add any significant additional variance to the model ( $p = .716$ : full table of results presented in Appendix F).

*Prediction of in-class satisfaction.* In order to examine the relationships between self-efficacy, relational efficacies and satisfaction, hierarchical multiple regression analysis was performed. Given that previous literature has supported a relationship between self-efficacy and affect-related variables (e.g., McAuley, Pena & Jerome, 2001), self-efficacy was entered on the first block. Following Lent and Lopez's (2002) suggestions that other- (e.g., instructor) efficacy and RISE beliefs are potentially related to satisfaction, these relational efficacies were entered together on the second block of the equation. Finally, to determine if proxy-efficacy added any unique variance over and above those efficacy values already entered, it was entered on the third block.

The overall model was significant ( $R^2_{Adj.} = .313, p < .001$ ). Self-regulatory efficacy accounted for 17% of the variance on the first block ( $R^2\Delta = .166, p < .001$ ). On the second block, instructor-efficacy and RISE beliefs accounted for an additional 9% ( $R^2\Delta = .087, p =$

.017) of the variance. In the third block, proxy-efficacy also accounted for significant additional variance in participants' satisfaction ( $R^2\Delta = .096, p = .002$ : full table of results presented in Appendix F).

*Prediction of intended intensity.* Lent and Lopez (2002) have suggested that both other-efficacy and RISE beliefs are associated with effort expended within a proxy-agency situation. To examine this possibility, a hierarchical multiple regression analysis was conducted to determine the strength of the relationship between task-efficacy, relational efficacies and intended exercise intensity. Given that past literature has shown self-efficacy to be a predictor of effort (Rudolph & McAuley, 1996) task-efficacy was entered on block one. In accordance with suggestions by Lent and Lopez (2002) that other-efficacy and RISE beliefs may be predictors of exercise effort, they were entered together on the second block. Proxy-efficacy was entered separately in the third and final block of the regression equation.

The overall model was significant, accounting for 22% of the total variance in intended intensity ( $R^2\text{Adj.} = .217, p < .001$ ). Task-efficacy accounted for 13% of the variance ( $R^2\Delta = .126, p = .001$ ) on the first block. Instructor efficacy and RISE beliefs did not add significant additional variance to the model ( $p = .063$ ). However, on the final block, proxy-efficacy added an additional significant 7% ( $R^2\Delta = .068, p = .011$ ) of additional variance (full table of results presented in Appendix F).

*Prediction of reliance.* Hierarchical multiple regression analysis was then used to determine the strength of the relationship between the relational efficacies and reliance on the instructor. As there has been previous support for both self-regulatory efficacy (Study 1) and proxy-efficacy (Studies 1 + 2) accounting for unique variance in reliance they were entered on

blocks one and two respectively. Instructor-efficacy and RISE beliefs were entered together on block three of the regression equation.

Self-efficacy along with the relational efficacies were shown to be additive predictors of reliance as the overall model accounted for 18% of the total variance in reliance ( $R^2_{Adj.} = .185$ ,  $p = .004$ ). Proxy-efficacy was shown to be the only predictor to account for a significant amount of unique variance ( $R^2_{\Delta} = .169$ ,  $p < .001$ : full table of results presented in Appendix F).

### *Attributional Differences*

Lent and Lopez suggest that a proxy's reinforcement of an individual's efficacy beliefs may encourage more positive attributions regarding exercise success. To investigate this possibility, an extreme groups comparison was used to examine if attributional differences existed between participants who were extremely different in their level of RISE beliefs. A tertile split procedure provided two extreme groups—a higher RISE group ( $M = 91.51$ ,  $n = 28$ ) and a lower RISE group ( $M = 49.90$ ,  $n = 26$ ). The rationale for this procedure is that if no differences can be detected in these extremes, they are unlikely to manifest themselves in a larger sample which includes moderate RISE. These groups were shown to be significantly different on reported RISE beliefs ( $t(52) = 16.34$ ,  $p = .001$ ).

In examining attributions across these two groups, the overall MANOVA was significant Wilks'  $\lambda = .746$ ,  $F(4, 49) = 4.17$ ,  $p = .005$ . Univariate F tests revealed that those reporting higher RISE beliefs attributed their exercise success to internal ( $M_{HIGH} = 23.71$  vs.  $M_{LOW} = 19.77$ ,  $F(1) = 7.25$ ,  $p = .010$ ,  $\eta^2 = .12$ ) personally controllable ( $M_{HIGH} = 24.21$  vs.  $M_{LOW} = 19.69$ ,  $F(1) = 10.89$ ,  $p = .002$ ,  $\eta^2 = .17$ ) and stable ( $M_{HIGH} = 21.28$  vs.  $M_{LOW} = 15.94$ ,  $F(1) = 12.40$ ,  $p = .001$ ,  $\eta^2 = .19$ ) factors to a greater extent than their lower RISE counterparts.

### *Examining Differences Between Level of Preferred Contact across Exercise Contexts*

Recall that participants self-selected to either a high contact preference ( $n = 64$ ) or a low contact preference group ( $n = 12$ ). This dichotomous classification was used as the between subjects factor with exercise context serving as the within subjects factor<sup>2</sup>. While the distribution reflected two highly unequal size groups, analysis was still conducted to examine for any parallels in the two previous studies. Potential differences in social-cognitions and intentions were examined using separate 2 (preferred context) by 2 (exercise context) mixed model MANOVAs<sup>3</sup>.

#### *Social-Cognitive and Affective Differences*

The 2 (preferred contact) by 2 (exercise context) mixed model MANOVA examining social-cognitive and affective differences was significant and revealed a number of significant multivariate effects. However, there was no main effect of preferred contact. For brevity's sake, significant effects are reported and additional reporting of univariate F tests occurs in Appendix G.

*Exercise context.* A significant multivariate within subjects main effect was found for context (Wilks'  $\lambda = .805$ ,  $F(3, 72) = 5.81$ ,  $p = .001$ ) with univariate F-tests indicating that participants had lower task efficacy when facing the challenge of exercising independently ( $p = .001$ ,  $\eta^2 = .15$ : for means see Appendix G).

*Contact preference by exercise context interactions.* More notable than the main effect was a significant preferred contact by exercise context interaction (Wilks'  $\lambda = .815$ ,  $F(3, 72) = 5.45$ ,  $p = .002$ ) which was shown to be significant for perceived satisfaction ( $p < .001$ ,  $\eta^2 = .17$ ).

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<sup>2</sup> A one-way MANOVA showed no significant differences on age or classes per week between the two groups (Wilks'  $\lambda = .959$ ,  $F(2, 66) = 1.40$ ,  $p = .254$ ).

<sup>3</sup> Box's M test indicated that the assumption of homogeneity of variance-covariance was met.

The nature of the interaction for perceived satisfaction is illustrated in Figure 3. Post-hoc Bonferroni tests revealed that participants preferring high contact reported higher perceived satisfaction within the proxy-led class condition ( $M_{HI-NORM} = 7.35$ ) as compared to their satisfaction with the independent exercise context ( $M_{HI-BC} = 5.67$ ) and as compared to that reported by low contact participants in the proxy-led exercise context ( $M_{LO-NORM} = 6.07$ ;  $p_s < .05$ ). There were no other significant differences.

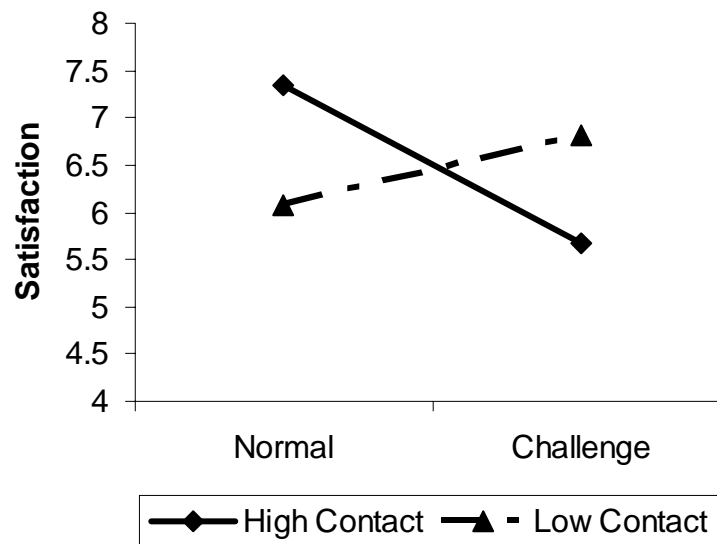


Figure 3. Study 3 contact by context interaction for perceived satisfaction  
Differences in Intention.

The 2 (preferred contact) by 2 (exercise context) mixed model MANOVA examining measures of intention differences also revealed a number of significant multivariate effects.

*Exercise context.* A significant multivariate within-subjects main effect was found for context (Wilks'  $\lambda = .756$ ,  $F(3, 72) = 7.73$ ,  $p < .001$ ). Subsequent univariate F-tests indicated that participants had weaker strength of intentions ( $p = .003$ ,  $\eta^2 = .11$ ) and intended to exercise with less intensity ( $p = .002$ ,  $\eta^2 = .12$ ) when faced with exercising independently as compared to when they were exercising in a proxy-led context (for means see Appendix G).



*Contact preference by exercise context interactions.* This main effect was superseded by a significant preferred contact by exercise context interaction (Wilks'  $\lambda = .884$ ,  $F(3, 72) = 3.16$ ,  $p = .030$ ) which was shown to be significant for both intention frequency ( $p = .005$ ,  $\eta^2 = .10$ ) and intention strength ( $p = .039$ ,  $\eta^2 = .06$ ).

Post-hoc Bonferroni corrected tests for the interactive effect on intention frequency revealed that high-contact participants had intended to attend significantly more sessions in the proxy-led context than did low contact participants ( $p < .05$ ). No other differences were evident (see Appendix G).

Post-hoc Bonferroni tests conducted to examine the nature of the interaction for intention strength showed that high contact participants had significantly weaker strength of intentions when they faced exercising independently as compared to when participating in a proxy-led context ( $p < .05$ ). No other differences were evident (see Appendix G).

### *Summary of Results*

To summarize, bivariate correlations and regression analyses provided preliminary evidence that proxy-efficacy, other-efficacy and RISE beliefs are related but distinct constructs, each making separate contributions when predicting specific social-cognitions related to the use of proxy-agency. Based upon a model driven by both theoretical rationale and previous empirical findings, the relational efficacies were shown to be additive predictors of self-regulatory efficacy, satisfaction, reliance and effort. Other-efficacy and RISE beliefs were shown to be the major predictors of self-efficacy, while proxy-efficacy was the major predictor of reliance. All relational efficacies contributed separate variance to the predictions of satisfaction and intended intensity. However, it is recognized that if different models were used (i.e., different order of

entry) that the amounts of variance contributed by the separate predictors (i.e.,  $R^2\Delta$ ) could potentially have been different.

MANOVA analyses also provided support for suggestions made by Lent and Lopez (2002) regarding the association between RISE beliefs and causal attributions. Specifically, it was shown that those who had higher RISE beliefs attributed their performance success or failure to internal, personally controllable and stable reasons to a greater extent than their lower RISE belief counterparts.

Multiple mixed model MANOVA analyses provided similar support for the impact of the use of proxy-agency in exercise on social-cognitions and intentions. Separate preference for proxy contact by exercise context analyses of differences in social-cognitions and intentions revealed that exercising independently was perceived as more challenging for those who more preferred frequent contact with a proxy-agent. These results should be cautiously interpreted, however, because comparisons were made between preferred contact groups that exhibited marked unequal size and variability.

## Discussion

The results of the present study provide insight into the differential importance of relational efficacy beliefs within the context of proxy-agency in exercise. They suggest that relational efficacy perceptions are separate constructs, each of which has distinct relationships with social-cognitions relevant to exercise participation. The relationships observed suggest initial support for the use of Lent and Lopez's (2002) conceptual extension to constructs that apply to Bandura's (1997) discussion of self- and proxy-efficacy as pertain to proxy-agency.

First, Lent and Lopez (2002) suggest that in interpersonal contexts there are networks of related but distinct efficacy beliefs (relational efficacies) that may influence personal and

relationship outcomes (e.g., self-efficacy, reliance, satisfaction, effort). In support of Lent and Lopez's (2002) suggestions, correlations revealed that relational efficacies were related yet independent constructs. Specific, relational efficacies were also shown to be important, additive predictors of self-efficacy beliefs, perceived satisfaction, effort expended and level of reliance on the instructor. As indicated by the  $R^2\Delta$  values, relational efficacies were shown to contribute different levels of separate variance to the model depending on the nature of the criterion variable. Results also support Bandura's (1997) theorizing on proxy-agency in that proxy-efficacy was shown to be the only efficacy belief that contributed unique variance to the prediction of reliance.

Considering the relationships observed, it may well be asked why proxy-efficacy was the most consistent predictor across the multiple predictive models. One explanation is that there was greater conceptual and operational correspondence between proxy-efficacy and certain criterion variables (e.g., satisfaction, effort, reliance). Thus, it is not necessarily surprising that proxy-efficacy would be a consistent predictor across criterion measures. Further, questions regarding proxy-related constructs had to be posed to people who were engaged within a proxy-led context. Thus, the probability that there would be some consistency of prediction by proxy-efficacy might be expected.

However, whereas proxy-efficacy was the most consistent predictor it was not necessarily the dominant predictor. Specifically, other measures were seen to have greater weight as compared to proxy-efficacy in predicting certain criterion variables. For example, in predicting satisfaction and effort, self-regulatory and task efficacy were seen to account for more variance than did proxy-efficacy. It is conceptually interesting, however, that in this proxy-led context proxy-efficacy was also accounted for significant additional variance.

Given that this is the first demonstration of a number of these relationships, to comment on the implications of the separate variance accounted for by each predictor would be speculative. However, the current evidence suggesting that multiple efficacy constructs contribute to the prediction of selected proxy-relevant cognitions underscores Bandura's (1997) theorizing on proxy-agency. Specifically, social-cognitions in proxy-led situations are associated with both what people see in themselves as well as how they perceive the proxy when attempting to obtain outcomes and be successful in their behavioural performance.

Second, Lent and Lopez (2002) suggest that the manner in which participants process efficacy related feedback from the proxy may influence the nature of their causal attributions. The relationships observed between RISE beliefs and causal attributions support this postulation.

Third, Bandura (1997) has suggested that the use of proxy-agency can hinder the development of beliefs about skills and abilities needed for efficacious action. Mixed model analyses provide support for the notion that the use of proxy-agency may not serve participants' well when they are confronted with the behavioural challenge of independent exercise.

#### *Study Limitations*

While the current results provide initial insights into the relationships between relational efficacy beliefs and relevant social-cognitions, this was a preliminary cross-sectional, investigation and its limitations must be recognized. One limitation is that results of the concurrent measurement of constructs must be interpreted in terms of associations and no causal inferences can be made. In keeping with previous work, the mixed model results provide modest evidence similar to the previous studies that suggests that proxy-agency may have the unintended effect of limiting the strength of personal self-regulatory beliefs for managing independent exercise. However, the current results must be interpreted with caution given the unequal size of

the high and low preferred contact groups. Further, although the measure of “other-efficacy” used in this study did capture the construct as outlined by Lent and Lopez (2002), it was borrowed from other work on proxy-agency in exercise where it was not used for this purpose (e.g., Bray et al., 2004). Therefore, future research on proxy-agency in exercise should endeavour to refine the operationalization of the “other-efficacy” construct.

#### *Strengths of the Study.*

In spite of its limitations, the present study had important conceptual strengths. This study represents the first examination of relational efficacy beliefs in the exercise literature. The current findings provide preliminary support for the use of Lent and Lopez’s (2002) conceptual view of self-efficacy theory to studying interpersonal relationships. The results of this study provide evidence of the importance of assessing multiple relational efficacy beliefs when examining participants’ social-cognitions within a situation of proxy-agency. Furthermore, these findings support Bandura’s (1997) theorizing on the potential impact of proxy-agency on an individual’s self-regulatory efficacy.

The current results represent only one aspect of the various relationships that exist in exercise situations where people use proxy-agency. Multiple interpersonal relationships are prevalent within the exercise domain (e.g., exercise class instructors and personal trainers - participants, , rehabilitation specialists - patients) and understanding proxy-agency in exercise may have potential adherence or learning implications for the relationships between exercise leaders or interventionists and their participants.

## General Discussion

Bandura's (1986, 2001) SCT has proven to be a useful theoretical framework in the study of exercise. Bandura outlines the importance of three different modes of agency: (a) personal-agency, (b) collective-agency, and (c) proxy-agency. To date, the majority of exercise research using the SCT has focused on the importance of personal-agency (self as agent) in understanding exercise social-cognitions and behaviour. However, when examining the various social contexts in which exercise takes place, there are numerous examples of individuals enlisting the help of another person (i.e., proxy-agent: personal trainer, exercise class instructor ) to assist them in successfully managing their exercise participation. These are examples of the use of proxy-agency. In his theorizing on proxy-agency, Bandura (1997) describes a potential dilemma. Specifically, while he suggests that the use of proxy-agency may facilitate an individual's development of self-regulatory skills and lead to successful performance, he cautions that continued use of proxy-agency may inhibit that individual's ability to independently self-regulate and limit the development of efficacy beliefs about these abilities. In turn, these consequences may lead to an over-reliance on the help of the proxy-agent. There has been little research on proxy-agency in exercise. However, the recent work that has been conducted (e.g., Bray et al., 2001) has focused on the benefits of using proxy-agency for the individual. The three studies in this thesis represent an initial examination of the selected social cognitions associated with the dilemma of using proxy-agency in exercise. Collectively, the results of the studies expand and extend the current evidence that supports Bandura's theorizing about the influence of proxy-agency on beliefs about personal abilities and future goals.

### *Contributions to Theory*

The results from the three studies support Bandura's (1997, 2001) theorizing about proxy-agency at four levels (see Appendix H). The first concerns the link between preferred level of proxy-contact, social-cognitions and exercise intentions in both proxy-led and independent exercise contexts. The second concerns the relationship between proxy-efficacy, self-efficacy and reliance on assistance from an instructor. The third concerns the choice to employ proxy-agency and the reasons behind it, while the fourth and final point concerns the relationships between a number of proxy-relevant efficacy beliefs.

*Behavioural challenge.* In discussing proxy-agency, Bandura warns that use of proxy-agency may "impede the cultivation of personal competencies" (p. 13, 2001), and reduce "the opportunities to build skills needed for efficacious action" (p. 17, 1997). Results from all three studies suggest that Bandura's assertions may be valid.

Results from Study 1 and 2 indicated that participants preferring more frequent contact with a proxy-agent reported lower confidence in their personal ability to manage the self-regulatory tasks necessary for successful exercise participation. Study 1 results also indicated that these high preferred -contact individuals had (a) lower confidence in their ability to perform the specific components of a comprehensive exercise program, (b) intended to exercise less frequently and (c) were less committed to their intended exercise frequency. Study 2 results added to these conclusions as high preferred-contact individuals perceived that maintaining their current level of activity over an extended period of time would be more difficult than those participants who preferred to self-manage their own exercise. Participants' preference for greater contact with a proxy, and their accompanying lower confidence, weaker intentions, and higher perceived difficulty about the management of their exercise participation suggests a

potential inability to adapt to circumstances demanding greater independence. Results indicated that all participants perceived exercising independently to be more challenging than exercising in a class led by a proxy (i.e., as inferred from their lower efficacy, weaker intentions, lower satisfaction, higher difficulty). However, the problematic consequences of proxy-agency when having to deal with exercising independently are all the more evident among those participants who preferred to have frequent contact with a proxy-agent while exercising. This was demonstrated through multiple, significant preferred contact by exercise context interactions. Specifically, participants preferring high-contact with a proxy reported lower self-regulatory efficacy (Study 1 + 2), lower task-efficacy (Study 1) and higher perceived difficulty (Study 2) when facing the challenge of exercising independently.

Significant interactions found in Study 3 also provided evidence of the differential responses of individuals who varied in preferred level of contact when they confronted a behavioural challenge. Specifically, high preferred-contact participants reported greater satisfaction in a proxy-led exercise situation whereas those preferring to self-manage exercise were found to be more satisfied with independent exercise. Also, high preferred-contact participants intended to exercise more frequently and with more intensity in the proxy-led context than when exercising independently.

These results appear to support Bandura's theorizing as the pattern of the social-cognitions reported by those preferring to be in frequent contact with a proxy reflected a perceived lack of personal competency to deal with behavioural challenges. However, the support for Bandura's assertions was not limited to social-cognitions. Study 2 results demonstrated that when confronted with the cancellation of their exercise classes, participants preferring high-contact were less likely to choose self-managed activity as an exercise option as



compared to those who preferred low-contact with a proxy. In addition, high-contact participants were less confident in their ability to pursue an alternative form of activity, felt it would be more difficult and expected to be less satisfied with the exercise experience compared to those who preferred low-contact with a proxy.

Bandura (1997) has noted that when individuals use proxy-agency on a very frequent basis, mastery opportunities for self-management do not arise. Thus, individuals lack the practice to succeed at self-management and thus do not obtain the direct experience that determines related efficacy beliefs. Consequently, they may be inadequately prepared to self-regulate when circumstances require the behavioural challenge of independent exercise (e.g., unexpected barriers, class cancellations, vacations, child care). Further, the absence of mastery experiences combined with the knowledge that a proxy-agent is available to assist in self-regulation may lead to a reliance on the help provided by the proxy-agent. This notion is considered next.

*Proxy-efficacy - reliance relationship.* Bandura states that “people foster self-induced dependencies when they can obtain valued outcomes more easily by having somebody else do things for them” (1997, p. 17). Once again, findings from the current series of studies suggest that this hypothesized link between proxy-efficacy and reliance is valid. Results from all three studies indicated that participants’ confidence in their instructor’s ability to help them self-regulate was related to their reliance on the assistance provided by the instructor. Specifically, participants reporting higher proxy-efficacy were also more highly reliant on the instructor’s assistance.

While proxy-efficacy was repeatedly shown to have a positive relationship with reliance, a consistent relationship between self-regulatory efficacy as a predictor of reliance was not

observed. This may be due to both the conceptual and operational correspondence between proxy-efficacy and reliance. One other issue that may be important in why self-regulatory efficacy was not shown to be consistently related to reliance is the nature of the samples recruited in the current series of studies. For the most part, participants were active individuals who regularly attended these classes and had been at least intermittently active. Given this exercise history, it is likely the current participants had developed some degree of self-regulatory skills. Therefore, these may not be the type individuals described by Bandura (1997) that require help from a proxy-agent due to low self-regulatory efficacy (e.g., older adults). In that instance one might expect that the constructs may be related in the following manner: lower self-regulatory efficacy and higher proxy-efficacy related to higher reliance. This effect was observed, in part, in Study 1. However, to fully flesh out the relationships that Bandura (1997) suggests, sampling from populations with potentially lower self-regulatory skills (e.g., older adults) may be needed as this may provide a stronger test of the two variables operating in concert. Future research should therefore continue to explore a potential relationship between self-efficacy and reliance in situations of proxy-agency in exercise.

Considering the link between proxy-agency and reliance the question arises, why do people choose to use a proxy-agent? This point is addressed next.

*Reasons for choice.* Bandura explains that while some people truly require the assistance of a proxy-agent in order to achieve their desired outcomes (e.g., the frail elderly; small children), proxy-agency is also frequently used by capable individuals who “surrender control to intermediaries” (Bandura, 2001; p. 13). Bandura (1997, 2001) suggests that individuals may *choose* to use proxy-agency because (a) they have not had the mastery experiences to develop the means to reach their desired outcomes, (b) they believe a proxy can better help them achieve

the outcomes, and (c) they do not want to shoulder the responsibility of direct control. Results from Study 2 support Bandura's theorizing. Specifically, preferring a high level of proxy-contact was shown to be a conscious choice by participants and was not due to some perceived inability to personally manage their own exercise participation. It was also found that those preferring high-contact had less past experience with independent exercise and considered the instructor to be more responsible than themselves for managing their exercise class participation. These results provide preliminary support for Bandura's suggested reasons for choosing to use proxy-agency.

*Proxy-efficacy and other efficacy constructs.* In addition to supporting Bandura's theorizing on proxy-agency, results from the present series of studies also support the recent conceptual view of proxy-agency offered by Lent and Lopez (2002). Specifically, Lent and Lopez (2002) suggest that in situations of proxy-agency, there is a network of relational efficacy perceptions that may influence both personal and relationship outcomes. Study 3 provided preliminary support that multiple relational efficacies were related but different constructs. Specifically, it was shown that proxy-efficacy, other-efficacy, and RISE beliefs are all moderately related. However, the magnitude of these relationships indicate that the constructs are not redundant. Results supported Lent and Lopez's (2002) hypothesized relationships in that relational efficacies (i.e., which includes proxy-efficacy) were positively related to self-efficacy, satisfaction, and intended effort. An association between reliance and relational efficacies was also demonstrated. Specifically, higher reliance was associated with higher proxy-efficacy. However, there was no association between reliance and self-efficacy. Proxy-efficacy was shown to be the most consistent predictor of the selected, social-cognitions. This may be reflective of both the conceptual and operational correspondence between proxy-efficacy and

these proxy-relevant constructs. Finally, RISE beliefs (i.e., the individual's perception of the instructor's belief about the individual's abilities) were associated with participants' causal attributions. Those individuals having higher RISE beliefs made more internal, personally controllable and stable attributions than their counterparts with lower RISE beliefs.

Taken together, these results provide an initial demonstration of the complex nature of proxy-agency and the importance of recognizing the various proxy-relevant perceptions that may influence both positive (self-efficacy, satisfaction) and negative (reliance) outcomes for the exerciser who is involved in the proxy-agency relationship.

### *Limitations*

It must be recognized that the study of proxy-agency in exercise is in its infancy and therefore these three studies should be considered as preliminary in nature. As such, they were not without their limitations. One limitation is that the results observed are only applicable to the sample population. Samples in each study were composed predominantly of females recruited from several community and university-based structured exercise classes. Recruiting participants from structured exercise classes was necessary to insure the salience of proxy-led exercise. While both significant main and interactive effects were seen across levels of preferred contact, sampling solely from exercise classes resulted in the majority of participants self-categorizing as preferring high proxy contact. Therefore, future studies should be conducted using different samples to facilitate more in depth comparisons between exercisers preferring high and low proxy-contact. Further, future research is needed in different proxy-agency situations within the exercise domain (e.g., personal trainers).

Another limitation concerns sample size. Whereas numerous multivariate effects were found, including significant context by contact interactions, there was evidence that our studies

might have benefited from increased statistical power for some findings. Specifically, although significant differences were not found at the traditional  $p < .05$  level, the pattern of means for intention strength (Study 1) and self-regulatory efficacy (Study 3) were in the same direction as the effects for other social cognitions for which significant interactions emerged. In addition, the pattern of means for personal responsibility observed in Study 2 were in keeping with the hypothesized results for instructor responsibility and independent exercise experience. Future researchers should calculate power estimates based on the current work to estimate sufficiently large sample sizes to examine these potential multivariate interactions. Alternatively, it may be advisable to consider those proxy-agency contexts in which stronger effects are hypothesized as more likely to occur (e.g., personal trainer - client relationships).

Finally, the studies were cross-sectional and limit causal inferences. Future work would benefit from employing longitudinal and or randomized designs in order to assess the predictive capability of the proxy-relevant constructs.

### *Strengths*

Despite these limitations, the current series of studies have important methodological and theoretical strengths. Each study used a quasi-experimental design which allowed for the assessment of social-cognitions across two different exercise contexts. It was therefore possible to begin to examine Bandura's assertion that independent exercise may be problematic for those frequently employing proxy-agency in regard to their self-regulatory beliefs about independently managing exercise. The current studies also extend previous work on proxy-agency which has suggested proxy-agency may be influential predominantly among exercise initiates (e.g., Bray et al., 2001). By demonstrating multiple, multivariate effects among active participants, the results suggest that the study of proxy-agency in exercise is important regardless of exercise experience.

Finally, this series of studies represent the only examinations of many of the constructs (e.g., RISE, proxy-efficacy) and relationships (e.g., proxy-efficacy - reliance) concerning proxy-agency in the exercise literature. As such, the current research provides both initial support for Bandura's (1997) theorizing on proxy-agency, and extends the demonstration of relationships in the previous exercise literature by including the examination of other theoretical constructs from social-cognitive theory (Bandura, 1986; 1997) that are associated with the use of proxy-agency (e.g., intentions, attributions, reliance, effort).

### *Practical Implications*

Given the potential widespread use of proxy-agency in activity (e.g., exercise classes: Bray et al., 2001) and health care settings (e.g., cardiac rehabilitation: Bray & Cowan, 2004; nursing homes: Baltes & Baltes, 1990), the current findings have future practical and research implications for both exercise professionals and interventionists. While proxy-agents often help to promote self-regulatory development and successful behavioural performance of proxy users professionals working in the health and exercise field must recognize the potential dilemma that may arise when individuals employ them as proxy-agents (Bandura, 1997). As the results from this series of studies suggest, use of proxy-agency may lead to reliance on the proxy and may be related to lower self-regulatory efficacy for skills that are necessary for the independent management of exercise participation. This is noteworthy given that long-term exercise adherence often requires individuals to deal with behavioural challenges (Marcus, Forsyth, Stone, et al., 2000). Exercise professionals and interventionists need to recognize that a participant's use of proxy-agency is often done voluntarily and is associated with a desire to avoid personal responsibility. However, if participants are voluntarily relinquishing control, increasing their reliance on a proxy, and limiting their self-regulatory efficacy, are they also limited in their ability to self-manage the

behavioural challenges of long-term exercise adherence? Should exercise professionals therefore be providing different forms of self-management training to counter the limitations associated with the dilemma that occurs with the use of proxy-agency? It would appear that participants engaged in high proxy-contact situations would benefit from planned mastery opportunities or practice with independently self-regulating their exercise in order to insure the development of the necessary self-regulatory skills (Bandura, 1997).

### *Future Work*

Future avenues for research on the dilemma of proxy-agency in physical activity contexts are suggested as emerging from the present research. First, there is a need for continued research to establish the conceptual links between psychological constructs and behavioural consequences of the use of proxy-agency. This objective would include differentiating self and relational efficacies because the present research has only provided a first-time description of these relationships. Potential moderators of the relationships between these proxy-related efficacy constructs could also be examined. Specifically, class size, time of contact with the instructor and instructor style may moderate the strength of participants' relational efficacy beliefs as well as the relationships between these constructs.

Second, exercise class instructors are only one type of proxy-agent employed in exercise contexts. Further insight about proxy-agency in exercise may be gained by examining the influence of other proxy-agents such as personal trainers, medical health care professionals and rehabilitation specialists.

Third, given Bandura's (1997) postulations that the need for proxy agency may increase with age, future study of proxy-agency in exercise may be especially important among symptomatic older adult and physically disabled populations (e.g., elderly, cardiac

rehabilitation). Intervention efforts among these groups frequently involves proxy-agents such as health-care providers. Their efforts to intervene may directly impact upon the potential for individuals with specific physical needs to develop self-regulatory beliefs about their physical capabilities and their abilities to self-manage their health problems.

Fourth, applied research is necessary to examine the most effective approach for exercise professionals to work with participants to teach them self-regulatory skills. Specifically, future work should examine whether a collaborative approach is beneficial in decreasing the potential negative consequences of frequent proxy-contact (cf. Meichenbaum & Turk, 1987). An initial step may be to examine potential social-context effects (e.g., instructor competency or social interaction style) influencing both participants' preferred level of contact and their related social-cognitions. For example, examining whether certain instructors are more effective in collaborating with participants and promoting self-regulatory beliefs may provide a model for future training interventions. Furthermore, because proxy-agency is a relationship involving two parties (proxy-agent and individual), a related future research goal associated with collaboration may be to examine the perceptions of the proxy as well as the participant. For example, this research could examine if their mutual efforts are developing the appropriate balance between use of proxy-agency and development of the participant's self-regulatory skills.

In conclusion, the current studies represent initial steps in the exploration of proxy-agency in exercise and there is a need for further study in a number of areas. However, the studies provide important preliminary insight into the use of proxy-agency in exercise and some of the consequences related to the potential dilemma that may accompany it.



## APPENDIX A - Study 1 Questionnaire Package

The questions addressed in this package are to examine the influence of others in managing your exercise. Although some questions may refer to your present exercise class instructor they are in no way a criticism of this instructor. Please note that we want to know only **your personal thoughts** in these situations, not the views of others.

All answers will be kept confidential and anonymous. Although some of the questions may seem repetitive all responses are important. There are no right or wrong answers. Please read all questions carefully and answer as honestly as possible.

### DEMOGRAPHICS

Female  Male Age \_\_\_\_\_

Marital Status:  Single  Divorced  Separated  Married  Widow(ed)

### EXERCISE HISTORY

Fitness class (type) \_\_\_\_\_ (e.g., spinning class, step-aerobics, Pilates)

Is this a registered  or a drop-in class ?

**If this is a drop-in class,**

What % of the time do you attend this particular class as your scheduled exercise (check one)?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5-25%                    | 26-50%                   | 51-75%                   | 75-100%                  |
| Not usually              | Sometimes                | Often                    | Almost Always            |

1) Is this your first time participating in a fitness class?  Yes  No

2) If NO, how long have you been participating in fitness classes? \_\_\_\_\_MONTHS

3) Prior to participating in this fitness class how would you describe your regular activity?  
(check one):

- Inactive (skip next question)
- Training with a personal trainer
- Exercising on your own at a health or fitness club
- Exercising on your own at home
- Participating in another structured fitness class/program

4) If you were exercising prior to participating in this fitness class:

a) Over the last month how many times per week did you exercise (at 30 min/session)? \_\_\_\_\_

**INSTRUCTOR ASSISTANCE**

In the exercise setting, **instructors** provide different types of assistance to many participants. Some forms of assistance are direct and others are indirect. How much do you count on the instructor for assistance in managing the following aspects of your exercise participation?

**First**, check only those tasks which are applicable for you.

**Second**, using the scale provided, please indicate the extent to which you count on your current class instructor for direct assistance on those specific tasks applicable to managing your regular exercise.

**Only provide values for those aspects in which you feel YOU do count on YOUR CLASS INSTRUCTOR for some help.**

Over the next 8 weeks, I will count on the class instructor to help:

|                                       |   |   |                        |   |   |                        |   |   |
|---------------------------------------|---|---|------------------------|---|---|------------------------|---|---|
| 1                                     | 2 | 3 | 4                      | 5 | 6 | 7                      | 8 | 9 |
| Count on a minimal amount of the time |   |   | Count on half the time |   |   | Count most of the time |   |   |

| Skill  | ✓ applicable tasks | I count on the instructor |
|--|--------------------|---------------------------|
| 1. Motivate me to exercise   | _____              | _____                     |
| 2. Insure that I use safe, effective exercise technique            | _____              | _____                     |
| 3. Schedule exercise sessions so that I exercise regularly         | _____              | _____                     |
| 4. Design an exercise program appropriate for my needs             | _____              | _____                     |
| 5. Boost my confidence in my ability to exercise                   | _____              | _____                     |
| 6. Monitor and regulate the intensity of my exercise appropriately | _____              | _____                     |
| 7. Set realistic exercise goals for me                             | _____              | _____                     |
| 8. Monitor my exercise progress                                    | _____              | _____                     |
| 9. Provide appropriate feedback and reinforcement                  | _____              | _____                     |
| 10. Other: _____   | _____              | _____                     |

## CONFIDENCE IN CLASS INSTRUCTOR

Now that you've indicated those aspects for which the class instructor may provide assistance, we would like to know how much confidence you have in the class instructor's skills in providing you with the assistance you require to manage specific aspects of regular exercise.

**First**, check only those tasks which are applicable for you.

**Second**, using the scale below, please provide values for those applicable tasks that indicate your confidence in YOUR CLASS INSTRUCTOR's ability to help you manage.

Over the next 8 weeks, I am \_\_\_\_ confident that the instructor can help me:

|            |     |     |          |     |     |     |            |     |     |      |
|------------|-----|-----|----------|-----|-----|-----|------------|-----|-----|------|
| 0%         | 10% | 20% | 30%      | 40% | 50% | 60% | 70%        | 80% | 90% | 100% |
| Not at all |     |     | Somewhat |     |     |     | Completely |     |     |      |

| Skill  | ✓ applicable tasks | Confidence |
|--|--------------------|------------|
| 1. Schedule exercise sessions so that I exercise regularly         | _____              | _____      |
| 2. Boost my confidence in my ability to exercise                   | _____              | _____      |
| 3. Monitor my exercise progress                                    | _____              | _____      |
| 4. Motivate me to exercise   | _____              | _____      |
| 5. Insure that I use safe, effective exercise technique            | _____              | _____      |
| 6. Design an exercise program appropriate for my needs             | _____              | _____      |
| 7. Set realistic exercise goals for me                             | _____              | _____      |
| 8. Monitor and regulate the intensity of my exercise appropriately | _____              | _____      |
| 9. Provide appropriate feedback and reinforcement                  | _____              | _____      |
| 10. Other: _____   | _____              | _____      |

**\*\*Check to be sure that you have provided confidence values ONLY for those aspects for which you feel you count on the instructor for assistance\*\***

**SELF-EFFICACY**

Thanks for answering our questions about who you count on in managing your participation in exercise. Next we'd like to see how you respond to the following questions. These questions are concerning managing aspects of your exercise participation. **Please think of yourself and respond using the scale provided.**

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

**How confident are you that YOU can manage the following aspects of your exercise program over the next 8 weeks?**

- 1. Motivate yourself to exercise \_\_\_\_\_
- 2. Use safe, effective exercise technique \_\_\_\_\_
- 3. Schedule exercise sessions so that you exercise regularly \_\_\_\_\_
- 4. Design an exercise program that is appropriate for your needs \_\_\_\_\_
- 5. Monitor your exercise progress \_\_\_\_\_
- 6. Set realistic exercise goals for yourself \_\_\_\_\_
- 7. Return to exercising after missing a session \_\_\_\_\_
- 8. Monitor and regulate the intensity of your exercise so you feel  
you've had a good workout \_\_\_\_\_
- 9. Perform any stretches provided in class \_\_\_\_\_
- 10. Perform any provided resistance training exercises \_\_\_\_\_
- 11. Perform the aerobic portion of the class \_\_\_\_\_

**EXERCISE CLASS INTENTIONS**

**First**, please indicate in the blank space the number of times per week that you intend to exercise in the fitness class for the next 8 weeks.

**Second**, please circle the number that best represents the strength of your intentions.

I will attend a minimum of \_\_\_\_\_ exercise classes/week over the next 8 weeks.  
 Definitely will not – 1 2 3 4 5 6 7 8 9 - Definitely will

**EXERCISE PREFERENCE**

Please indicate the means with which you prefer to carry out your exercise **most of the time** (Check only one).

\_\_\_\_\_1. Being instructed by a knowledgeable trainer or class instructor all of the time where the exercise is planned, delivered and completely guided (i.e., **frequent / constant contact with a class instructor or trainer**).

\_\_\_\_\_2. Having part-time guidance from a trainer or class instructor and part self-guided activity where the exercise is planned, but you have to learn and manage exercise to a greater extent than you have in the past (i.e., **occasional contact with a class instructor or trainer**).

\_\_\_\_\_3. Self-guided exercise most of the time with a few tips on technique or motivation from a trainer or class instructor here and there (i.e., **infrequent contact with a class instructor or trainer**).

**Thanks a lot for your help. Now we'd like you to think about and answer questions about what you would do in a final set of circumstances.**

**Please answer the following sets of questions under the assumption that your current exercise class is completely cancelled and unavailable as an exercise option.**

**CONFIDENCE OUTSIDE OF CLASS**

If the class was cancelled for 8 weeks, how confident are you that you can manage the following aspects of your exercise program on your own over those 8 weeks? Please use the scale provided.

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

How confident are you that you could manage the following aspects of your exercise program on your own over the next 8 weeks?

- 1. Motivate yourself to exercise \_\_\_\_\_
- 2. Use safe, effective exercise technique \_\_\_\_\_
- 3. Schedule exercise sessions so that you exercise regularly \_\_\_\_\_
- 4. Design an exercise program that is appropriate for your needs \_\_\_\_\_
- 5. Monitor your exercise progress \_\_\_\_\_

- 6. Set realistic exercise goals for yourself \_\_\_\_\_
- 7. Return to exercising after missing a session \_\_\_\_\_
- 8. Monitor and regulate the intensity of your exercise so you feel  
you've had a good workout \_\_\_\_\_
- 9. Perform appropriate stretching activities \_\_\_\_\_
- 10. Perform appropriate resistance training exercises \_\_\_\_\_
- 11. Perform appropriate aerobic exercise \_\_\_\_\_

**EXERCISE INTENTIONS**

If your current exercise class was **completely cancelled**

**First**, please indicate in the blank space the number of times per week that you would exercise for the next 8 weeks.

**Second**, please circle the number that best represents the strength of your intentions.

I will exercise a minimum of \_\_\_\_\_times/week over the next 8 weeks.

Definitely will not – 1 2 3 4 5 6 7 8 9 - Definitely will

## APPENDIX B - Study 2 Questionnaire Package



**DEMOGRAPHICS**

Female  Male      Age: \_\_\_\_\_

Marital Status (check one):

Single  Divorced  Separated  Married Widow(ed)

Education level (check one):

|                             |                          |                           |                          |
|-----------------------------|--------------------------|---------------------------|--------------------------|
| Some high school            | <input type="checkbox"/> | Some university           | <input type="checkbox"/> |
| Completed high school       | <input type="checkbox"/> | Completed bachelor degree | <input type="checkbox"/> |
| Some community college      | <input type="checkbox"/> | Masters or PhD            | <input type="checkbox"/> |
| Completed community college | <input type="checkbox"/> |                           |                          |

**EXERCISE HISTORY**

Is this a registered  or a drop-in class  ?

What % of your overall exercise does this class make up?

|   |   |
|---|---|
| <input type="checkbox"/> 5-25%, Not very much | <input type="checkbox"/> 51-75%, Most       |
| <input type="checkbox"/> 26-50%, Some         | <input type="checkbox"/> 76-100% Almost All |

Is this your first time participating in a fitness class? Yes  No

If NO, how long have you been participating in fitness classes? \_\_\_\_\_MONTHS

3) Prior to participating in this fitness class, how would you describe your main approach to exercising? (check one):

Inactive (skip next question)                       Exercising on your own at home

Exercising on your own at a health or fitness club    Training with a personal trainer

Participating in another structured fitness class/program

Over the last month how many times per week did you attend an exercise class of at least 30 min in duration? \_\_\_\_\_/week.

Over the last month how many times per week did you plan and exercise on your own outside of the class for at least 30 min/session? \_\_\_\_\_ /week.

## CONFIDENCE

These questions are about management of your exercise participation. Please think of yourself and respond using the scale provided.

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

How confident are you that YOU can manage EACH of the following aspects of your exercise program **over the next 4 weeks?** (please type your answer in the shaded box)

1. Motivate yourself to exercise regularly (e.g., 3-5times/week, at least 30min/session) \_\_\_\_\_
2. Use safe, effective exercise technique (e.g., proper warm-up, stretching) \_\_\_\_\_
3. Schedule exercise into your week so that you exercise regularly (e.g 3-5x/wk) \_\_\_\_\_
4. Plan out a program of exercises that helps you achieve your exercise goals \_\_\_\_\_
5. Monitor your weekly exercise progress so that you continue to challenge yourself \_\_\_\_\_
6. Set realistic, weekly, short-term exercise goals for yourself \_\_\_\_\_
7. Return to exercising after missing a session \_\_\_\_\_
8. Monitor and regulate the intensity of your exercise during each exercise session \_\_\_\_\_
9. Perform the stretches provided in class at a level so that you find it at least moderately difficult. \_\_\_\_\_
10. Perform all of the resistance training exercises provided in class at a level so that you find it at least moderately difficult. \_\_\_\_\_
11. Perform the aerobic portion of the class at a level so that you find it at least moderately difficult. \_\_\_\_\_

**PERSONAL RESPONSIBILITY**

Knowing that various tasks in your exercise classes are products of the participants’, the instructor’s, or joint efforts, use the scale provided to indicate how much responsibility you feel **YOU HAVE** in managing these specific tasks during **your class.** (please type your answer in the shaded box)

|    |   |     |     |     |                |     |     |     |                |     |       |  |
|----|---|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-------|--|
|    | 0%  | 10% | 20% | 30% | 40%            | 50% | 60% | 70% | 80%            | 90% | 100%  |  |
|    | No  |     |     |     | Some           |     |     |     | Complete       |     |       |  |
|    | Responsibility                                    |     |     |     | Responsibility |     |     |     | Responsibility |     |       |  |
| 1. | Managing the way time is used in the session      |     |     |     |                |     |     |     |                |     | _____ |  |
| 2. | Motivating you to achieve your exercise goals     |     |     |     |                |     |     |     |                |     | _____ |  |
| 3. | Selecting the exercises that you will do          |     |     |     |                |     |     |     |                |     | _____ |  |
| 4. | Determining how hard the exercise session will be |     |     |     |                |     |     |     |                |     | _____ |  |
| 5. | Determining your satisfaction with the session    |     |     |     |                |     |     |     |                |     | _____ |  |
| 6. | Determining your feelings during the session      |     |     |     |                |     |     |     |                |     | _____ |  |
| 7. | Establishing exercise goals for the session       |     |     |     |                |     |     |     |                |     | _____ |  |
| 8. | Achieving your exercise goals                     |     |     |     |                |     |     |     |                |     | _____ |  |

**EXERCISE DIFFICULTY**

Place the difficulty value in the space to the right of each statement below to indicate how difficult you feel it would be to continue to maintain your current level of exercise.(please write in the shaded box)

|  |            |   |   |   |           |   |   |   |           |    |  |
|--|------------|---|---|---|-----------|---|---|---|-----------|----|--|
|  | 1          | 2 | 3 | 4 | 5         | 6 | 7 | 8 | 9         | 10 |  |
|  | Not at all |   |   |   | Somewhat  |   |   |   | Extremely |    |  |
|  | Difficult  |   |   |   | Difficult |   |   |   | Difficult |    |  |

Maintaining my current level of exercise for...

1. **One more week** would be \_\_\_\_\_
2. **Two more weeks** would be \_\_\_\_\_
3. **Three more weeks** would be \_\_\_\_\_
4. **Four more weeks** would be \_\_\_\_\_

**SATISFACTION**

Please use the scale below to answer each of the following questions about your level of satisfaction with your current exercise (type your response in the shaded box).

|              |   |   |   |           |   |   |   |           |
|--------------|---|---|---|-----------|---|---|---|-----------|
| 1            | 2 | 3 | 4 | 5         | 6 | 7 | 8 | 9         |
| Very         |   |   |   | Somewhat  |   |   |   | Very      |
| Dissatisfied |   |   |   | Satisfied |   |   |   | Satisfied |

Given your current exercise experience, how satisfied you are with...

- 1. Your current exercise classes providing the outcomes you desire (e.g., weight loss)? \_\_\_\_\_
- 2. The variety of exercises available to you? \_\_\_\_\_
- 3. The intensity of your workouts? \_\_\_\_\_
- 4. When exercise fits into your schedule? \_\_\_\_\_
- 5. How your exercise sessions help you progress towards your exercise goals (e.g., exercising 3-5 times per week)? \_\_\_\_\_

**INSTRUCTOR ASSISTANCE**

In the exercise setting, **instructors** provide different types of assistance to many participants. We would like to know **WHAT** assistance you count on from the instructor, the **EXTENT** to which you count on him/her and how much **CONFIDENCE** you have in his/her ability to help you. Please *completely read through and follow the steps* as outlined below.

**Step 1** – Indicate using an X those aspects for which you feel you receive assistance from the instructor.

**Step 2 - For the tasks you’ve marked**, use the scale provided to indicate the extent to which you count on your current class instructor for direct assistance in managing those specific aspects of your regular exercise.

FOR STEP 2 USE THIS SCALE (use the shaded box provided):

Over **the next 4 weeks**, I will count on the class instructor \_\_\_\_\_ to help me:

|                  |   |   |   |               |   |   |   |                  |
|------------------|---|---|---|---------------|---|---|---|------------------|
| 1                | 2 | 3 | 4 | 5             | 6 | 7 | 8 | 9                |
| a minimal amount |   |   |   | half the time |   |   |   | most of the time |
| of time          |   |   |   |               |   |   |   |                  |

**Step 3 – For the tasks you’ve marked**, use the scale provided to indicate your confidence in THE CLASS INSTRUCTOR’S ABILITY to help you manage those aspects of your regular exercise.

FOR STEP 3 USE THIS SCALE (use the shaded box provided):

Over the **next 4 weeks**, I am \_\_\_\_ confident that the instructor can help me:

0%   10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

Not at all

Somewhat

Completely

**Only provide values for those aspects in which you feel YOU will count on YOUR CLASS INSTRUCTOR for some help over the next 4 weeks.**

**CONSIDER THIS EXAMPLE:**

| Step 1 Help                         | Step 2 Count | Step 3 Confidence |
|-------------------------------------|--------------|-------------------|
| X                                   | 1-9          | 0-100             |
| <input checked="" type="checkbox"/> | 7            | 85                |

1. Motivate myself to attend the class regularly.

|  | Step 1                   | Step 2                         | Step 3                              |
|--|--------------------------|--------------------------------|-------------------------------------|
|  | Receive help             | Count on instructor to help me | Confidence in instructor to help me |
|  | X                        | “min” 1 – 9 “max”              | 0-100%                              |
| 1. Motivate myself to attend the <i>class</i> regularly.   | <input type="checkbox"/> | _____                          | _____                               |
| 2. Motivate myself to challenge myself <i>in class</i> so the exercise is at least moderately difficult. | <input type="checkbox"/> | _____                          | _____                               |
| 3. Use safe, effective exercise technique <i>in class</i> .<br>(e.g., warm-up, stretches, proper form)   | <input type="checkbox"/> | _____                          | _____                               |
| 4. Monitor and regulate the intensity of my exercise <i>in class</i> .                                   | <input type="checkbox"/> | _____                          | _____                               |
| 5. Set realistic goals for my <i>in-class</i> exercise participation.                                    | <input type="checkbox"/> | _____                          | _____                               |
| 6. Monitor my weekly exercise progress <i>in class</i> so that I continue to challenge myself.           | <input type="checkbox"/> | _____                          | _____                               |
| 7. Plan a progressive exercise program that helps me   | <input type="checkbox"/> | _____                          | _____                               |

achieve my exercise goals.

8. Schedule exercise sessions so that I exercise regularly (3-5x/wk)  \_\_\_\_\_
9. Set realistic, weekly, short-term exercise goals for the exercise I do *outside of class*.  \_\_\_\_\_
10. Motivate myself to exercise regularly *outside of class* (e.g., 3-5 times/week)  \_\_\_\_\_
11. Learn safe and effective exercise technique for use in exercise *outside of class*.  \_\_\_\_\_
12. Motivate myself to challenge myself so that my exercise *outside of class* is at least moderately difficult.  \_\_\_\_\_

### **INSTRUCTOR RESPONSIBILITY**

Knowing that various tasks in exercise classes are products of the participants', the instructor's, or joint efforts, use the scale provided to indicate how much responsibility you feel **the exercise class instructor has** in managing these specific tasks during **your class** (write your answers to each item in the shaded boxes provided).

- | 0%   | 10% | 20% | 30% | 40% | 50%            | 60% | 70% | 80% | 90% | 100%           |
|--|-----|-----|-----|-----|----------------|-----|-----|-----|-----|----------------|
| No   |     |     |     |     | Some           |     |     |     |     | Complete       |
| Responsibility                                       |     |     |     |     | Responsibility |     |     |     |     | Responsibility |
| 1. Managing the way time is used in the session      |     |     |     |     |                |     |     |     |     | _____          |
| 2. Motivating you to achieve your exercise goals     |     |     |     |     |                |     |     |     |     | _____          |
| 3. Selecting the exercises that you will do          |     |     |     |     |                |     |     |     |     | _____          |
| 4. Determining how hard the exercise session will be |     |     |     |     |                |     |     |     |     | _____          |
| 5. Determining your satisfaction with the session    |     |     |     |     |                |     |     |     |     | _____          |
| 6. Determining your feelings during the session      |     |     |     |     |                |     |     |     |     | _____          |
| 7. Establishing exercise goals for the session       |     |     |     |     |                |     |     |     |     | _____          |
| 8. Achieving your exercise goals                     |     |     |     |     |                |     |     |     |     | _____          |

## **PREFERRED MODE OF EXERCISE**

Please indicate the means (# 1 OR # 2) with which you prefer to carry out your exercise **most of the time** (Check only one).

For the means you selected (#1 or 2), please indicate the explanation of your choice (# a OR # b) **that most closely reflects** your personal situation (check only one)

1. I prefer being instructed by a knowledgeable trainer or class instructor most of the time where the exercise is planned, delivered and completely guided (i.e., **frequent / constant contact with a class instructor or trainer**)...

### **WHY?**

a)... because I don't have much exercise experience and I don't feel capable of managing all of the aspects of my exercise participation (e.g., exercise selection, motivation)

b)... because although I have exercise experience, the trainer helps me to manage the difficult aspects of my exercise participation (e.g., exercise selection, motivation).

2. I prefer self-guided exercise most of the time with only occasional guidance on technique or motivation from a trainer or class instructor (i.e., **infrequent / occasional contact with a class instructor or trainer**)...

### **WHY?**

a)...because I have exercise experience and feel capable of managing the aspects of my exercise participation on my own (e.g., exercise selection, motivation).

b)...because although I don't have much exercise experience, I want to try and manage the aspects of my exercise participation on my own (e.g., exercise selection, motivation).

**Thanks a lot for your help with this section. Now we'd like you to think about and answer questions about what you would do in a final set of circumstances. Please answer the following sets of questions under the assumption that ALL AVAILABLE EXERCISE CLASSES have just been COMPLETELY CANCELLED and unavailable as an exercise option for the next 4 weeks.**

### **DIFFICULTY WITHOUT CLASS**

Place the difficulty value in the space to the right of each statement below to indicate how difficult you feel it would be to continue to maintain your current level of exercise.(use the shaded boxes provided)

|            |   |   |   |           |   |   |           |   |    |
|------------|---|---|---|-----------|---|---|-----------|---|----|
| 1          | 2 | 3 | 4 | 5         | 6 | 7 | 8         | 9 | 10 |
| Not at all |   |   |   | Somewhat  |   |   | Extremely |   |    |
| Difficult  |   |   |   | Difficult |   |   | Difficult |   |    |

Given that **all** exercise classes are **unavailable**, maintaining my current level of exercise on my own for

1. **One week** would be \_\_\_\_\_
2. **Two weeks** would be \_\_\_\_\_
3. **Three weeks** would be \_\_\_\_\_
4. **Four weeks** would be \_\_\_\_\_

### **CONFIDENCE WITHOUT CLASS**

If classes were cancelled for 4 weeks, how confident are you that **you can manage** the following aspects of your exercise program **on your own** over those 4 weeks? Use the scale provided.

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

**Given that all exercise classes were unavailable as an exercise option**, how confident are you that you could manage EACH of the following aspects of your exercise program completely **ON YOUR OWN** over the next 4 weeks?

1. Motivate yourself to exercise regularly (e.g., 3-5times/week, at least 30min/session) \_\_\_\_\_
2. Use safe, effective exercise technique (e.g., proper warm-up, stretching) \_\_\_\_\_
3. Schedule exercise into your week so that you exercise regularly (e.g 3-5x/wk) \_\_\_\_\_
4. Plan out a program of exercises that helps you achieve your exercise goals. \_\_\_\_\_
5. Monitor your weekly exercise progress so that you continue to challenge yourself. \_\_\_\_\_



6. Set realistic, weekly, short-term exercise goals for yourself \_\_\_\_\_
7. Return to exercising after missing a session \_\_\_\_\_
8. Monitor and regulate the intensity of your exercise during each exercise session \_\_\_\_\_
9. Perform stretching activities for all of your major muscle groups (e.g., legs, back, chest) at a level so that you find it at least moderately difficult. \_\_\_\_\_
10. Perform resistance training exercises for all of your major muscle groups (e.g., legs, chest, back) at a level so that you find it at least moderately difficult. \_\_\_\_\_
11. Perform continuous aerobic exercise at a level so that you find it at least moderately difficult. \_\_\_\_\_

### **SATISFACTION WITHOUT CLASS**

Please use the following scale to answer each of the following questions about your level of satisfaction with your current exercise (**given all classes are cancelled**).

|                   |   |   |                    |   |   |                |   |   |
|-------------------|---|---|--------------------|---|---|----------------|---|---|
| 1                 | 2 | 3 | 4                  | 5 | 6 | 7              | 8 | 9 |
| Very Dissatisfied |   |   | Somewhat Satisfied |   |   | Very Satisfied |   |   |

Given your current exercise experience, how satisfied you are with...

1. Your current exercise sessions providing the outcomes you desire (e.g., weight loss)? \_\_\_\_\_
2. The variety of exercises available to you? \_\_\_\_\_
3. The intensity of your workouts? \_\_\_\_\_
4. When exercise fits into your schedule? \_\_\_\_\_
5. How your exercise sessions help you progress towards your exercise goals (e.g., exercising 3-5 times per week)? \_\_\_\_\_

**ALTERNATE ACTIVITY CHOICE**

If you had alternative activity choices, **what course of action would you be most likely to take** given that the current exercise classes were completely cancelled?

Of the options listed below, please indicate the ONE which is closest to the approach that you would prefer to take *over the next 4 weeks* (**check only one**).

- 1. Enlist the help of a personal trainer to guide my exercise
- 2. Attempt to enroll in an exercise class at another facility.
- 3. Ask the facility staff to provide me with an orientation to the exercise equipment and tips on how to exercise properly on my own.
- 4. Self-manage my own exercise routine (either exercising at home or at the club).
- 5. Wait the 4 weeks until the next set of exercise classes is offered (rather than exercising intermittently on my own).

Using the scale below, how confident are you that you could pursue this exercise option for the next 4 weeks?\_\_\_\_\_

0      10      20      30      40      50      60      70      80      90      100%

Using the scale below, how satisfied do you anticipate being with this alternative activity choice for the next 4 weeks?\_\_\_\_\_

|              |   |   |           |   |   |   |   |           |
|--------------|---|---|-----------|---|---|---|---|-----------|
| 1            | 2 | 3 | 4         | 5 | 6 | 7 | 8 | 9         |
| Very         |   |   | Somewhat  |   |   |   |   | Very      |
| Dissatisfied |   |   | Satisfied |   |   |   |   | Satisfied |

Using the scale below, how difficult would it be to pursue this alternative activity choice for the next 4 weeks?\_\_\_\_\_

|            |   |   |          |   |   |   |   |   |           |
|------------|---|---|----------|---|---|---|---|---|-----------|
| 1          | 2 | 3 | 4        | 5 | 6 | 7 | 8 | 9 | 10        |
| Not at all |   |   | Somewhat |   |   |   |   |   | Extremely |

## APPENDIX C - Study 3 Questionnaire Package

**DEMOGRAPHICS + EXERCISE HISTORY**

Female  Male      Age: \_\_\_\_\_

Prior to participating in this fitness class, how would you describe your main approach to exercising? (check one):

- Inactive (skip next question)                       Training with a personal trainer  
 Exercising on your own at a health or fitness club    Exercising on your own at home  
 Participating in another structured fitness class/program

Over the last month how many times per week did you attend an exercise class of at least 30 min in duration? \_\_\_\_\_/week.

Over the last month how many times per week did you plan and exercise on your own outside of the class for at least 30 min/session? \_\_\_\_\_ /week.

**CONFIDENCE**

These questions are about management of your exercise participation. Please think of yourself and respond using the scale provided.

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

How confident are you that YOU can manage EACH of the following aspects of your exercise program **over the next 4 weeks?** (please type your answer in the shaded box)

1. Motivate yourself to exercise regularly (e.g., 3-5times/week, at least 30min/session) \_\_\_\_\_
2. Use safe, effective exercise technique (e.g., proper warm-up, stretching) \_\_\_\_\_
3. Schedule exercise into your week so that you exercise regularly (e.g 3-5x/wk) \_\_\_\_\_
4. Plan out a program of exercises that helps you achieve your exercise goals \_\_\_\_\_
5. Monitor your weekly exercise progress so that you continue to challenge yourself \_\_\_\_\_
6. Set realistic, weekly, short-term exercise goals for yourself \_\_\_\_\_
7. Return to exercising after missing a session \_\_\_\_\_
8. Monitor and regulate the intensity of your exercise during each exercise session \_\_\_\_\_

9. Perform the stretches provided in class at a level so that you find it at least moderately difficult. \_\_\_\_\_
10. Perform all of the resistance training exercises provided in class at a level so that you find it at least moderately difficult. \_\_\_\_\_
11. Perform the aerobic portion of the class at a level so that you find it at least moderately difficult. \_\_\_\_\_

## SATISFACTION

Please use the scale below to answer each of the following questions about your level of satisfaction with your current exercise (type your response in the shaded box).

|                   |   |   |                    |   |   |                |   |   |
|-------------------|---|---|--------------------|---|---|----------------|---|---|
| 1                 | 2 | 3 | 4                  | 5 | 6 | 7              | 8 | 9 |
| Very Dissatisfied |   |   | Somewhat Satisfied |   |   | Very Satisfied |   |   |

Given your current exercise experience, how satisfied you are with...

1. Your current exercise classes providing the outcomes you desire (e.g., weight loss)? \_\_\_\_\_
2. The variety of exercises available to you? \_\_\_\_\_
3. The intensity of your workouts? \_\_\_\_\_
4. When exercise fits into your schedule? \_\_\_\_\_
5. How your exercise sessions help you progress towards your exercise goals (e.g., exercising 3-5 times per week)? \_\_\_\_\_

## INSTRUCTOR ASSISTING YOU

In the exercise setting, **instructors** provide different types of assistance to many participants.

We would like to know

- 1) WHAT assistance you count on from the instructor,
- 2) The EXTENT to which you count on instructor and
- 3) How much CONFIDENCE you have in instructor ability **to help you specifically**.

Please *completely read through and follow the steps* as outlined below.

**Step 1**-Indicate by clicking the box  WHAT aspects you feel you receive assistance with from the instructor.

**Step 2**-For the tasks you’ve marked, use the scale provided to indicate the EXTENT to which you count on your current class instructor for direct assistance in managing those specific aspects of your regular exercise.

FOR STEP 2 USE THIS SCALE (use the shaded boxes provided):

Over the **next 4 weeks**, I will count on the class instructor to help me \_\_\_\_of the time:

1            2            3            4            5            6            7            8            9

a minimal amount    half the time    most of the time

of time

**Step 3**-For the tasks you’ve marked, use the scale provided to indicate your CONFIDENCE in the class instructor’s ability to assist you in managing those aspects of your regular exercise.

FOR STEP 3 USE THIS SCALE (use the shaded boxes provided):

Over the **next 4 weeks**, I am \_\_\_\_ confident that the instructor can help me:

0%    10%    20%    30%    40%    50%    60%    70%    80%    90%    100%

Not at all    Somewhat    Completely

**Only provide values for those aspects in which you feel YOU will count on YOUR CLASS INSTRUCTOR for some help over the next 4 weeks.**

**HERE IS THIS EXAMPLE:**

|   | Step 1<br>Help                      | Step 2<br>Count | Step 3<br>Confidence |
|---|-------------------------------------|-----------------|----------------------|
|   | X                                   | 1-9             | 0-100                |
| 1. Motivate myself to attend the class regularly. | <input checked="" type="checkbox"/> | 7               | 85                   |

|  | Step 1                   | Step 2                         | Step 3                              |
|--|--------------------------|--------------------------------|-------------------------------------|
|  | Receive help             | Count on instructor to help me | Confidence in instructor to help me |
|  | X                        | “min” 1 – 9 “max”              | 0-100%                              |
| 1. Motivate myself to attend the <i>class</i> regularly.   | <input type="checkbox"/> | _____                          | _____                               |
| 2. Motivate myself to challenge myself <i>in class</i> so the exercise is at least moderately difficult. | <input type="checkbox"/> | _____                          | _____                               |
| 3. Use safe, effective exercise technique <i>in class</i> .  | <input type="checkbox"/> | _____                          | _____                               |

(e.g., warm-up, stretches, proper form)

- |   |                          |       |       |
|---|--------------------------|-------|-------|
| 4. Monitor and regulate the intensity of my exercise <i>in class</i> .  | <input type="checkbox"/> | _____ | _____ |
| 5. Set realistic goals for my <i>in-class</i> exercise participation.   | <input type="checkbox"/> | _____ | _____ |
| 6. Monitor my weekly exercise progress <i>in class</i> so that I continue to challenge myself.                        | <input type="checkbox"/> | _____ | _____ |
| 7. Plan a progressive exercise program that helps me achieve my exercise goals.                                       | <input type="checkbox"/> | _____ | _____ |
| 8. Schedule exercise sessions so that I exercise regularly (3-5x/wk)  | <input type="checkbox"/> | _____ | _____ |
| 9. Set realistic, weekly, short-term exercise goals for the exercise I do <i>outside of class</i> .                   | <input type="checkbox"/> | _____ | _____ |
| 10. Motivate myself to exercise regularly <i>outside of class</i> (e.g., 3-5 times/week)                              | <input type="checkbox"/> | _____ | _____ |
| 11. Learn safe and effective exercise technique for use in exercise <i>outside of class</i> .                         | <input type="checkbox"/> | _____ | _____ |
| 12. Motivate myself to challenge myself so that my exercise <i>outside of class</i> is at least moderately difficult. | <input type="checkbox"/> | _____ | _____ |

### CONFIDENCE IN INSTRUCTOR

In teaching an exercise class there are a number of tasks which instructors often perform for everyone's benefit. We would like to know **how confident you are in your exercise class instructor's ability to perform these tasks for the class as a whole**.

Please note, this shouldn't be interpreted as an evaluation or criticism that will be directed at your instructor. Your responses will be completely anonymous and will in no way affect your instructor's standing at the facility. Use the following scale as a guide and indicate your responses in the shaded boxes provided.

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

My confidence in my exercise leader's capabilities to do the following for the class as a whole over the next month is:

1. Include a variety of exercises/moves during classes \_\_\_\_\_
2. Incorporate new moves in classes \_\_\_\_\_
3. Vary routines from class to class \_\_\_\_\_
4. Teach a cool-down so that I am breathing at the same rate as when I began the class \_\_\_\_\_
5. Teach class so that my heart rate is in my exercising/work-out target zone \_\_\_\_\_
6. Motivate me to keep the proper intensity by doing all the exercises her/himself \_\_\_\_\_
7. Teach a warm-up that has me breathing moderately hard so that I am prepared for the cardio part of my class. \_\_\_\_\_
8. Clearly explain/break-down the moves \_\_\_\_\_
9. Teach a cool-down that has stretches for major muscle groups (e.g., front and back of legs and arms, upper and lower back, etc.) \_\_\_\_\_
10. Teach the cardiovascular part of class so that I am breathing hard continuously \_\_\_\_\_
11. Motivate through verbal comments to keep the proper intensity for all exercises \_\_\_\_\_
12. Provide appropriate/timely verbal cues \_\_\_\_\_
13. Provide easy-to-follow instructions during class \_\_\_\_\_
14. Provide instruction to class members if they don't know how to do a move \_\_\_\_\_
15. Provide verbal cues (e.g., counts down) that warn ahead of time about upcoming moves \_\_\_\_\_
16. Provide music that is the right tempo for the warm-up, cardio, and cool-down parts of the class. \_\_\_\_\_
17. Give verbal praise for good effort throughout the class. \_\_\_\_\_



**PREFERRED MODE OF EXERCISE**

Please indicate the means with which you prefer to carry out your exercise **most of the time**.

1. I prefer being instructed by a knowledgeable trainer or class instructor most of the time where the exercise is planned, delivered and completely guided (i.e., **frequent / constant contact with a class instructor or trainer**)...

2. I prefer self-guided exercise most of the time with only occasional guidance on technique or motivation from a trainer or class instructor (i.e., **infrequent / occasional contact with a class instructor or trainer**)...

**INTENTIONS**

**First**, please indicate in the blank space the average number of **times per week** that you intend to exercise in the next 4 weeks.

I will attend a minimum of \_\_\_\_ scheduled exercise classes **per week** over the next 4 weeks.

**Second**, please check the number that best represents the extent to which you will or will not follow through with your intentions.

Definitely will not – 1 2 3 4 5 6 7 8 9 - Definitely will

**Finally**, please indicate the average intensity that you intend to work at during these sessions.

I will exercise at an average intensity that is \_\_\_\_ (use the following scale as a guide)

Very light - 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 - Very intense

**INSTRUCTOR’S CONFIDENCE IN YOU**

The following questions concern how much confidence **you feel your exercise class instructor has in your ability** to manage your exercise participation (Use the scale provided as a guide).

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

I believe my class instructor is \_\_\_\_ confident that I can \_\_\_\_ over the next 4 weeks. (use the shaded boxes provided).

1. Motivate myself to exercise regularly (e.g., 3-5times/week, at least 30min/session) \_\_\_\_

2. Use safe, effective exercise technique (e.g., proper warm-up, stretching) \_\_\_\_\_
3. Return to exercising after missing a session \_\_\_\_\_
4. Monitor and regulate the intensity of my exercise during each exercise session \_\_\_\_\_

**ATTRIBUTIONS**

1) Please check one.

Over the past month do you feel you were successful  or unsuccessful  in managing your own exercise participation?

2) To what do you attribute the primary reason for being successful or unsuccessful in managing your own exercise participation (indicate the most important factor in the shaded box)? \_\_\_\_\_

3) Now, please describe the reason (as indicted in the shaded box above) for being either successful or unsuccessful by rating it across the following dimensions (check the appropriate value for each item).

*HERE IS AN EXAMPLE*

If the reason for your success was mostly manageable by you, you may respond as follows:

|                   |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                       |
|-------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------------|
| Manageable by you | 9                        | 8                        | 7                                   | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | not manageable by you |
|                   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                       |

Is the cause something:

**9 8 7 6 5 4 3 2 1**

- |                                   |                          |                          |                          |                          |                          |                          |                          |                          |                          |                                     |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Reflects an aspect of yourself | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reflects an aspect of the situation |
| 2. Manageable by you              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not manageable by you               |
| 3. Permanent                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temporary                           |
| 4. You can regulate               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | You cannot regulate                 |
| 5. Over which others have control | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Over which others have no control   |
| 6. Inside of you                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Outside of you                      |
| 7. Stable over time               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Variable over time                  |

8. Under the power of other people           Not under the power of other people
9. Something about you           Something about others
10. Over which you have power           Over which you have no power
11. Unchangeable           Changeable
12. Other people can regulate           Other people cannot regulate

**Thanks a lot for your help with this section. Now we'd like you to think about and answer questions about what you would do in a final set of circumstances. Please answer the following sets of questions under the assumption that ALL AVAILABLE EXERCISE CLASSES have just been COMPLETELY CANCELLED and unavailable as an exercise option for the next 4 weeks.**

**CONFIDENCE WITHOUT CLASS**

If classes were cancelled for 4 weeks, how confident are you that **you can manage** the following aspects of your exercise program **on your own** over those 4 weeks? Use the scale provided.

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

**Given that all exercise classes were unavailable as an exercise option, how confident are you that you could manage EACH of the following aspects of your exercise program completely ON YOUR OWN over the next 4 weeks?**

1. Motivate yourself to exercise regularly (e.g., 3-5times/week, at least 30min/session) \_\_\_\_\_
2. Use safe, effective exercise technique (e.g., proper warm-up, stretching) \_\_\_\_\_
3. Schedule exercise into your week so that you exercise regularly (e.g 3-5x/wk) \_\_\_\_\_
4. Plan out a program of exercises that helps you achieve your exercise goals \_\_\_\_\_
5. Monitor your weekly exercise progress so that you continue to challenge yourself \_\_\_\_\_
6. Set realistic, weekly, short-term exercise goals for yourself \_\_\_\_\_

- 7. Return to exercising after missing a session \_\_\_\_\_
- 8. Monitor and regulate the intensity of your exercise during each exercise session \_\_\_\_\_
- 9. Perform stretching activities for all of your major muscle groups (e.g., legs, back, chest) at a level so that you find it at least moderately difficult. \_\_\_\_\_
- 10. Perform resistance training exercises for all of your major muscle groups (e.g., legs, chest, back) at a level so that you find it at least moderately difficult. \_\_\_\_\_
- 11. Perform continuous aerobic exercise at a level so that you find it at least moderately difficult. \_\_\_\_\_

**SATISFACTION WITHOUT CLASS**

Please use the following scale to answer each of the following questions about your level of satisfaction with your current exercise (**given all classes are cancelled**).

1       2       3       4       5       6       7       8       9

Very Dissatisfied

Somewhat Satisfied

Very Satisfied

Given your current exercise experience (classes cancelled), how satisfied you are with...

- 1. Your current exercise sessions providing the outcomes you desire (e.g., weight loss)? \_\_\_\_\_
- 2. The variety of exercises available to you? \_\_\_\_\_
- 3. The intensity of your workouts? \_\_\_\_\_
- 4. When exercise fits into your schedule? \_\_\_\_\_
- 5. How your exercise sessions help you progress towards your exercise goals (e.g., exercising 3-5 times per week)? \_\_\_\_\_

**EXERCISE INTENTIONS WITHOUT CLASS**

**First**, please indicate in the blank space the average number of **times per week** that you intend to exercise in the next 4 weeks.

I will exercise at least 30min on my own a minimum of \_\_\_\_times **per week** over the next 4 weeks.

**Second**, please check the number that best represents the extent to which you will or will not follow through with your intentions.

Definitely will not – 1 2 3 4 5 6 7 8 9 - Definitely will

**Finally**, please indicate in the blank space, the average intensity that you intend to work at during these sessions.

**Given that all exercise classes are cancelled,**

I will exercise at an average intensity that is \_\_\_\_ (use the following scale as a guide)

Very light - 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 - Very intense

APPENDIX D - Study 3 Feedback Sheet for Participants

## **FEEDBACK SHEET FOR PARTICIPANTS**

### **Surrendering direct control: Determinants of preferred proxy contact in exercise**

Thank you for your involvement in this study. The purpose of this project was to examine the influence exercise class participants' exercise cognitions and behaviours have on their choice to obtain assistance from an exercise proxy (e.g., class instructor).

The results from this study will help us in determining whether the level of proxy-contact people prefer is related to the confidence one has in their exercise instructor, the confidence they have in themselves, or the attributions they make for their exercise success. This information will also help in directing exercise interventions aimed at enhancing motivation to adopt and adhere to physical activity programs. It will probably take approximately 4 months before the results of this study are fully analyzed. An executive summary of the main findings of this study will be available to interested persons as of December 1, 2004. If you are interested in receiving a copy of this executive summary please e-mail the lead researcher before December 1, 2004. In the meantime, we have included several references related to this study that may be of interest to you.

The \$75 prizewinner will be chosen at random at the completion of all data collection. Only the winner will be notified.

This project has been reviewed by, and received ethics clearance through the Office of Research Ethics at the University of Waterloo and you may contact this office at (519) 888-4567, ext. 6005 if you have any comments or concerns resulting from your involvement in this study.

If you have any questions regarding the study itself, please contact Dr. Lawrence Brawley at ext. 3153, or by e-mail at [lrbrawle@healthy.uwaterloo.ca](mailto:lrbrawle@healthy.uwaterloo.ca). Or, you can also contact Chris Shields at [cashield@ahsmail.uwaterloo.ca](mailto:cashield@ahsmail.uwaterloo.ca)

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## APPENDIX E - Study 3 Descriptive Statistics

| Variable                          | Mean  | SD    |
|-----------------------------------|-------|-------|
| Exercise Management efficacy      | 72.41 | 20.29 |
| Exercise-efficacy                 | 80.04 | 18.84 |
| Proxy-efficacy                    | 74.97 | 15.88 |
| Instructor-efficacy               | 80.83 | 10.84 |
| RISE beliefs                      | 72.50 | 19.12 |
| Satisfaction                      | 7.17  | 1.43  |
| Intention Frequency               | 3.37  | 1.50  |
| Intention Strength                | 8.06  | 0.85  |
| Intended Intensity                | 16.56 | 1.70  |
| Reliance                          | 6.09  | 1.94  |
| Total tasks relying on assistance | 5.22  | 3.72  |
| Locus of control                  | 21.49 | 5.35  |
| Personal control                  | 21.95 | 4.90  |
| Stability                         | 17.92 | 6.24  |
| External control                  | 12.00 | 5.87  |

Note. Efficacy 0- 100%, Satisfaction 1-9, Intention Strength 1-9, Intended Intensity 6-20, Reliance 1-9, Attributions 3-27.

APPENDIX F - Prediction of Social-Cognitions by Relational Efficacies

Table F1 - Prediction of in-class self-regulatory efficacy

|                     | <u>Individual Contributions</u> |       |      | <u>Overall Model</u> |       |      |
|---------------------|---------------------------------|-------|------|----------------------|-------|------|
|                     | R <sup>2</sup> Δ                | FΔ    | p    | β                    | t     | p.   |
| Block 1             | .210                            | 20.20 | .001 |                      |       |      |
| Instructor-efficacy |                                 |       |      | .252                 | 2.22  | .029 |
| Block 2             | .151                            | 17.71 | .001 |                      |       |      |
| RISE beliefs        |                                 |       |      | .453                 | 4.18  | .001 |
| Block 3             | .001                            | 0.13  | .716 |                      |       |      |
| Proxy-efficacy      |                                 |       |      | -.039                | -0.36 | .716 |

Table F2 - Prediction of in-class satisfaction

|                          | <u>Individual Contributions</u> |       |      | <u>Overall Model</u> |       |      |
|--------------------------|---------------------------------|-------|------|----------------------|-------|------|
|                          | R <sup>2</sup> Δ                | FΔ    | p    | β                    | t     | p.   |
| Block 1                  | .166                            | 15.08 | .001 |                      |       |      |
| Self-regulatory efficacy |                                 |       |      | .268                 | 2.26  | .027 |
| Block 2                  | .087                            | 4.32  | .017 |                      |       |      |
| Instructor-efficacy      |                                 |       |      | .196                 | 1.64  | .105 |
| RISE beliefs             |                                 |       |      | -.061                | -0.50 | .618 |
| Block 3                  | .096                            | 10.71 | .002 |                      |       |      |
| Proxy-efficacy           |                                 |       |      | .353                 | 3.27  | .002 |

Table F3 - Prediction of in-class intended effort

|                     | <u>Individual Contributions</u> |       |      | <u>Overall Model</u> |      |      |
|---------------------|---------------------------------|-------|------|----------------------|------|------|
|                     | R <sup>2</sup> Δ                | FΔ    | p    | β                    | t    | p.   |
| Block 1             | .126                            | 10.98 | .001 |                      |      |      |
| Task-efficacy       |                                 |       |      | .207                 | 1.78 | .080 |
| Block 2             | .063                            | 2.86  | .063 |                      |      |      |
| Instructor-efficacy |                                 |       |      | .004                 | .034 | .973 |
| RISE beliefs        |                                 |       |      | .165                 | 1.36 | .178 |
| Block 3             | .068                            | 6.72  | .011 |                      |      |      |
| Proxy-efficacy      |                                 |       |      | .298                 | 2.59 | .011 |

Table F4 - Prediction of reliance

|                          | <u>Individual Contributions</u> |       |      | <u>Overall Model</u> |       |      |
|--------------------------|---------------------------------|-------|------|----------------------|-------|------|
|                          | R <sup>2</sup> Δ                | FΔ    | p    | β                    | t     | p.   |
| Block 1                  | .007                            | 0.52  | .471 |                      |       |      |
| Self-regulatory efficacy |                                 |       |      | -.235                | -1.78 | .080 |
| Block 2                  | .169                            | 15.42 | .001 |                      |       |      |
| Proxy-efficacy           |                                 |       |      | .379                 | 3.15  | .002 |
| Block 3                  | .009                            | 0.39  | .681 |                      |       |      |
| Instructor-efficacy      |                                 |       |      | .107                 | 0.80  | .427 |
| RISE beliefs             |                                 |       |      | .023                 | 0.17  | .866 |

APPENDIX G - Study 3 Contact by Context Analyses of Social-Cognitions and Intentions

Table G1 - Study 3 Main Effect for Exercise Context on Task Efficacy

|               | Normal | Challenge | F     | $\eta^2$ | P    |
|---------------|--------|-----------|-------|----------|------|
| Task efficacy | 77.50  | 64.85     | 12.89 | .15      | .001 |

*Note.* Efficacy 0 - 100% scales

Table G2 - Study 3 Main Effect for Exercise Context for Intention Strength and Intensity

|                    | Normal | Challenge | F     | $\eta^2$ | P    |
|--------------------|--------|-----------|-------|----------|------|
| Intention Strength | 7.93   | 7.15      | 9.53  | .11      | .003 |
| Intended Intensity | 16.49  | 15.18     | 10.27 | .12      | .002 |

*Note.* Intention strength 1-9, Intended intensity 6 - 20 scale.

Table G3 - Study 3 Contact by Context Interaction for Intention Frequency and Strength

|                     | <u>High Contact</u> |                   | <u>Low Contact</u> |           |
|---------------------|---------------------|-------------------|--------------------|-----------|
|                     | Normal              | Challenge         | Normal             | Challenge |
| Intention frequency | 3.59 <sup>a</sup>   | 3.14              | 2.17 <sup>a</sup>  | 3.08      |
| Intention strength  | 8.11 <sup>b</sup>   | 6.80 <sup>b</sup> | 7.75               | 7.50      |

*Note.* <sup>a</sup>  $p < .05$ , <sup>b</sup>  $p < .05$

## Appendix H - General Summary of Results



| Finding   | Support | Theoretical Relevance  |
|---|---------|--|
| 1) Contact by context interactions                          | Strong  | Proxy-agency may impede development of important skills needed for efficacious action Bandura (1997)                                     |
| 2) Preferred contact main effects                           | Modest  |  |
| 3) ↑ Proxy-efficacy associated with ↑ reliance              | Strong  | People foster self-induced dependencies when they can obtain outcomes with help of proxy-agent (Bandura, 1997).                          |
| 4) High contact associated with ↓ independent exercise      | Unique  | Individuals <i>choose</i> to use proxy-agency because they have not developed the means, and/or they do not want personal responsibility |
| 5) High contact associated with ↑ instructor responsibility | Unique  |  |
| 6) Relational efficacies associated with social-cognitions  | Unique  | Network of relational efficacy perceptions that influence personal and relationship outcomes (Lent & Lopez, 2002)                        |

*Note.* Strong support (all 3 studies), Modest support (2 studies) and unique support (1 study)

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