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**STRUGGLING WITH EXERCISE DECISIONS: THE INFLUENCE
OF ACUTE THOUGHTS AND COPING SELF-EFFICACY**

By

Nancy Clare Gyurcsik

**A thesis
presented to the University of Waterloo
in the fulfilment of the
thesis requirement for the degree of
Doctor of Philosophy
in Kinesiology**

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Abstract

Using self-efficacy theory (Bandura, 1997) as a foundation, the primary objectives of the series of studies in this dissertation were to investigate (a) the influence of acute negative and positive thoughts as they impact on decisions to exercise, (b) the processes involved in coping with acute, negative thoughts, and (c) the impact of coping-related social cognitions on decision making, intention, and behavior. Acute thoughts were conceptualized as daily thoughts that exercisers experience as a function of deciding whether to exercise as planned. In Study One, exercisers reported a multitude of acute, negative and positive thoughts. The frequency and overall tone of these acute thoughts predicted a behavioral form of self-efficacy (i.e., attend planned exercise). This form of self-efficacy predicted exercise intention and behavior. These findings are supportive of the contentions in self-efficacy theory (Bandura, 1997) of an indirect relationship between thoughts and intention and between thoughts and behavior. Study One also revealed that negative thinkers had significantly lower self-efficacy and exercise attendance compared to positive thinkers. Interestingly, negative thinkers still managed to attend exercise at a fairly high rate (i.e., 73%). This raised the possibility that they had developed effective strategies to cope with their negative thoughts.

The purpose of Study Two was to examine this coping process. This study revealed that exercisers employed a variety of behavioral and cognitive problem-focused coping strategies. This finding is in accord with coping theory (Lazarus & Folkman, 1984). This study also revealed that exercisers' beliefs in the effectiveness of these strategies (i.e., coping response efficacy) predicted exercise intention. This finding is supportive of contentions in self-efficacy theory (Bandura, 1997).

Study Three attempted to further this understanding of the coping process. It was found that coping self-efficacy, or beliefs in abilities to execute coping strategies, was predictive of social cognitive aspects of the decision-making process. Evidence of the distinctiveness of coping self-efficacy from a behavioral form of efficacy (i.e., scheduling self-efficacy) was also obtained. In Study Three, an attempt to manipulate positive and negative thinkers' coping self-efficacy via persuasive messages (i.e., high and moderate efficacy messages) did not produce the hypothesized effects. Study attrition may have contributed to this failure. Furthermore, negative thinkers who adhered to the study and who were exposed to the high efficacy message had high premanipulation levels of coping self-efficacy. Thus, they had little room for efficacy enhancement. However, negative thinkers who adhered to the study and who were exposed to the moderate message showed an effect in the expected direction. This group had a moderate level of premanipulation coping self-efficacy. Other effects of study attrition and message manipulation are also reported.

Taken together, the findings of these three studies support contentions from self-efficacy theory (Bandura, 1997) and suggest that the influence of acute, exercise-related thoughts on exercise behavior is a topic worthy of continued research. This research should also examine the process involved in coping with acute, negative thoughts and the influence of coping-related social cognitions (i.e., coping self-efficacy and coping response efficacy) on decision-making variables, exercise intention, and exercise behavior. Finally, examination of methods to manipulate coping self-efficacy is also encouraged.

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Table of Contents

STRUGGLING WITH EXERCISE DECISIONS: THE INFLUENCE OF ACUTE THOUGHTS AND COPING SELF-EFFICACY

	Page
Title Page	i
Author's Declaration	ii
Borrowers' Page	iii
Abstract	iv
Acknowledgements	vi
Table of Contents	vii
List of Tables	xiii
List of Figures	xiv
General Introduction	1
Influence of Social Cognitions on Intent and Behavior	1
Do Acute Cognitions Influence Intent and Behavior?	4
Perspectives from Social Cognitive and Self-Efficacy Theories	6
Perspectives from Coping Theory	8
Coping: Response Efficacy and Self-Efficacy	10
Study One	16
Introduction	16
Acute Thoughts	17
Measurement of Acute Thoughts	19
Relationship of Acute Thoughts to Exercise Intention and Behavior	21
Summary	22
Method	24
Participants	24
Measures	24
Retrospective Exercise Thoughts Measure (RET)	24
Prospective Exercise Thoughts Measure (PET)	25
Self-Efficacy (SE)	25

Behavioral Intention (BI)	26
Exercise Attendance (ATTD)	26
Procedure	26
Results	27
Descriptives	27
Retrospective Exercise Thoughts	28
Prospective Exercise Thoughts	29
Self-Efficacy, Intention, and Behavior	32
Comparison of Positive and Negative Thinkers	32
Retrospective Exercise Thoughts	32
Prospective Exercise Thoughts	34
Relationship of Exercise Thoughts to Intention and Behavior	36
Prediction of Exercise Intention	36
Retrospective Exercise Thoughts	36
Prospective Exercise Thoughts	37
Prediction of Exercise Behavior	39
Retrospective Exercise Thoughts	39
Prospective Exercise Thoughts	39
Secondary Analyses	39
Summary of Findings	39
Discussion	40
Strengths and Limitations	43
Future Directions	44
Study Two	46
Introduction	46
Coping	46
Thoughts as Internal Demands	47
Coping Strategies and Categories	48
Coping Response Efficacy	52
Summary	53
Method	54
Participants	54
Measures	55
Negative Exercise Thoughts	55
Perceived Impact on Initial Exercise Intention	56
Coping Strategy	56
Coping Response Efficacy	57
Perceived Change in Exercise Intention Postcoping	57
Procedure	58
Questionnaire Administration	58
Coding of Coping Strategies	58
Results	59

Descriptive Statistics	59
Negative Exercise Thoughts	59
Perceived Impact on Initial Exercise Intention	62
Coping Strategies	62
Coping Response Efficacy	64
Perceived Change in Exercise Intention Postcoping	64
Relationship Between Coping Response Efficacy and Change in Intention	64
Perceptions of Negative Thought Impact: Individual Differences	65
Prior Exercise History and Negative Thoughts	65
Coping Response Efficacy and Perceived Change in Intention	69
Postcoping	
Summary	72
Discussion	72
Influence of Negative Thoughts on Initial Exercise Intention	73
Coping Response Efficacy and Perceived Change in Intention Postcoping	74
Coping Strategies	76
Strengths and Limitations	77
Future Directions	78
Study Three	80
Introduction	80
Influence of Coping Self-Efficacy	81
Influence of Coping Self-Efficacy on Intention, Struggle, and	81
Exercise Decision	
Influence of Coping Self-Efficacy on Behavior	83
Influence of Coping Self-Efficacy on Affect	85
Summary	86
Controlling for Moderations in the Manipulation of Coping Self-Efficacy	87
Impact of Persuasive Messages on Self-Efficacy	89
Persuasive Messages Used in the Present Study	90
Disincentiveness of Coping Self-Efficacy	91
Method	93
Participants	93
Measures	94
Frequency of Acute Exercise Thoughts	94
Decision Struggle	95
Coping Strategies	95
Coping Self-Efficacy	96
Scheduling Self-Efficacy	97
Exercise Decision	97
Intention	98
Coping-Related Behavior	99
Affect	101

Procedure and Design	101
Coping Self-Efficacy Manipulation	104
Message Quality	106
Analyses	106
Presentation of Results	106
Missing Data	107
Outliers	108
Results	109
Study Attrition	109
Time 1 (Premanipulation) Descriptives	112
Primary Variable Descriptives	112
Secondary Variable Descriptives	115
Time 1 (Premanipulation) Bivariate Correlations	115
Time 1 (Premanipulation) Hierarchical Multiple Regressions	118
Decision Struggle	118
Exercise Decision	119
Exercise Intention	121
Affect	121
Time 1 (Premanipulation) Multivariate Analyses	123
Time 2 (Postmanipulation) Descriptives	126
Primary Variable Descriptives	126
Secondary Variable Descriptives	130
Message Quality and Content	130
Time 2 (Postmanipulation) Bivariate Correlations	132
Time 2 (Postmanipulation) Hierarchical Multiple Regressions	134
Analysis Issues	134
Decision Struggle	138
Exercise Decision	140
Exercise Intention	142
Affect	144
Coping-Related Behavioral Intention	146
Coping-Related Behavior	148
Time 2 (Postmanipulation) Analyses of Covariance	148
Coping Self-Efficacy ANCOVA	149
Remaining ANCOVAs	152
Study Attrition Analyses	156
Descriptives and Analyses of Time 1 Variables Within Positive and Negative Groups	157
Descriptives and Analyses of Variables Between Thinker by Message Conditions	161
Summary	167
Discussion	170
Relationship Between Coping Self-Efficacy and the Primary Variables	170

	Coping Self-Efficacy and Decision Struggle	170
	Coping Self-Efficacy and Exercise Decision	172
	Coping Self-Efficacy and Exercise Intention	172
	Coping Self-Efficacy and Affect	173
	Coping Self-Efficacy and Coping-Related Behavioral Intention	174
	Coping Self-Efficacy and Coping-Related Behavior	175
	Distinctiveness of Coping Self-Efficacy	175
	Differences Between Positive and Negative Thinkers	176
	Manipulation of Coping Self-Efficacy	178
	Unexpected Reactions to the Persuasive Message	180
	Strengths, Limitations, and Caveats	181
	Future Directions	183
General Discussion		185
	Strengths, Limitations, and Caveats	192
	Future Directions	194
References		198
Appendixes		208
A	Study One: Questionnaire	208
B	Study One: Bivariate Correlations Between Primary Variables: Retrospective	217
	Bivariate Correlations Between Primary Variables: Prospective	219
C	Study Two: Questionnaire	220
D	Study Two: Coping Categories for Time-Related Thoughts	229
	Coping Categories for Specific Commitment Thoughts	232
	Coping Categories for Motivational/Affective Thoughts	233
	Coping Categories for Physical Thoughts	234
	Coping Categories for Class-Related Thoughts	235
	Coping Categories for Ungrouped Thoughts	236
E	Study Two: Problem-Focused Cognitive Coping Strategies	237
	Problem-Focused Behavioral Coping Strategies	239
	Problem-Focused Combination Coping Strategies	240
F	Study Two: Distribution of the Perceived Impact of Thoughts on Initial Intention: Previously Actives	241
G	Study Three: Time 1 (Premanipulation) Questionnaire	243
H	Study Three: Time 2 (Postmanipulation) Questionnaire	253
I	Study Three: High Coping Self-Efficacy Message	265
	Moderate Coping Self-Efficacy Message	268
J	Study Three: Debriefing Letter: High Coping Self-Efficacy Message	270

		Debriefing Letter: Moderate Coping Self-Efficacy Message	274
K	Study Three	Time 1: Type and Frequency of Acute Positive Thoughts	277
		Time 1: Type and Frequency of Acute Negative Thoughts	279
L	Study Three	Time 1 Coping Strategies Used by Positive and Negative Thinkers	280
M	Study Three	Time 1 Correlations Between Primary Variables: Positive Thinkers	282
		Time 1 Correlations Between Primary Variables: Negative Thinkers	284
N	Study Three	Time 2: Type and Frequency of Acute Positive Thoughts	285
		Time 2: Type and Frequency of Acute Negative Thoughts	287
O	Study Three	Time 2 Coping Strategies Used by Positive and Negative Thinkers	288
P	Study Three	Message Quality: Type of Thinker by Type of Message	290
Q	Study Three	Time 2 Correlations Between Primary Variables: Positive Thinkers	292
		Time 2 Correlations Between Primary Variables: Negative Thinkers	294
R	Study Three	Correlations: Dummy Variables, Time 1 Struggle Covariate and All Time 2 Predictors	295
S	Study Three	Adjusted Struggle, Decision, and Affect Means for Main Effects	297
		Adjusted Struggle, Decision, and Affect Means for Interactions	299
T	Study Three	Time 1 and 2 Decision Struggle in Study Adherers	300
		Time 1 and 2 Exercise Decision in Study Adherers	302
		Time 1 and 2 Exercise Intention in Study Adherers	303
		Time 1 and 2 Scheduling Self-Efficacy in Study Adherers	304

List of Tables

Table	Title	Page
1	Number of Participants Experiencing Retrospective and Prospective Thoughts	31
2	Means for Overall Positive and Negative Thinkers	35
3	Prediction of Intention by Retrospective and Prospective Thoughts and Related Efficacy	38
4	Type and Frequency of Acute Negative Thoughts	61
5	Coping Categories: Use, Frequency, and Response Efficacy	63
6	Comparing Initial Impact Groups: Exercise History and Acute Negative Thoughts	68
7	Comparing Initial Impact Groups: Response Efficacy and Intention	71
8	Study Attrition by Condition	111
9	Time 1 Primary Variables: Descriptives for Positive and Negative Thinkers	113
10	Time 1 Bivariate Correlations Between Primary Variables	117
11	Time 1 Hierarchical Multiple Regressions: Decision Struggle and Exercise Decision	120
12	Time 1 Hierarchical Multiple Regressions: Exercise Intention and Affect	122
13	Time 1 Comparison of the Means of Positive and Negative Thinkers	125
14	Time 2 Primary Variables: Descriptives for Positive and Negative Thinkers	128
15	Participants' Views of Message Quality and Acceptance	131
16	Time 2 Bivariate Correlations Between Primary Variables	133
17	Comparison of the Means of Study Adherers at Time 1	136
18	Prediction of Time 2 Decision Struggle	139
19	Prediction of Time 2 Exercise Decision	141
20	Prediction of Time 2 Exercise Intention	143
21	Prediction of Time 2 Affect	145
22	Prediction of Coping-Related Behavioral Intention	147
23	Adjusted Mean Coping Self-Efficacy by Condition	151
24	Analysis of Covariance of Time 2 Decision Struggle	153
25	Analysis of Covariance of Time 2 Exercise Decision	154
26	Analysis of Covariance of Time 2 Affect	155
27	Primary Variable Descriptives for Negative and Positive Dropouts and Adherers	159
28	Coping Self-Efficacy in Study Adherers	163
29	Affect in Study Adherers	166
30	Mean Comparisons: People who Chose or Chose Not to Learn About Coping	169

List of Figures

Figure	Title	Page
E1	Distribution of the Perceived Impact of Thoughts on Initial Intention: Previously Actives	242

General Introduction

Research continues to show that regular physical activity results in numerous physical and psychological benefits. For example, a regular program of exercise decreases the risk of developing cardiovascular diseases and specific types of cancers and is related to increases in health-related quality of life, psychological well-being, and acute mood (Surgeon General's Report: U.S. Department of Health and Human Services, 1996). However, Canada's recent Physical Activity Guide for Healthy Active Living revealed that 60% of Canadian adults are not sufficiently active to achieve any benefits from exercise (Health Canada, 1998). Furthermore, for those people who do initiate a regular program of exercise, approximately 50% will dropout (Surgeon General's Report: U.S. Department of Health and Human Services, 1996). These statistics suggest that two broad issues must be addressed in the exercise domain. Exercise initiation is one issue. Specifically, exercise researchers must determine the method(s) that best convince people to initiate a regular physical activity program. Exercise nonadherence is the second issue. Specifically, exercise researchers must identify the psychological determinants of exercise nonadherence. Doing so should help people maintain their initial exercise motivation as they attempt to adhere to their exercise programs over time. The focus of this dissertation is on the latter issue.

Influence of Social Cognitions on Intent and Behavior

In the exercise psychology domain, one way to address the issue of nonadherence is to investigate individuals' cognitions and to attempt to identify those cognitions that either encourage or discourage exercise intention and behavior. For example, investigations have focused on various cognitions such as attitudes, expected health and other benefits, normative

beliefs, self-schemata for exercise, self-efficacy, and outcome expectancies (see Dishman & Sallis, 1994 for a review of cognitive determinants of exercise). It has been argued that individuals may experience a variety of influential cognitions when exercise is not a habitual behavior and individuals are struggling to adopt, change, or maintain a regular pattern of exercise (Bandura, 1997; Maddux, Brawley, & Boykin, 1995). Considered more specifically, both (a) cognitive beliefs which are relatively stable, although amenable to change, over time (e.g., attitudes, perceived control, self-efficacy) and (b) acute cognitions that arise on a more day-to-day basis in response to struggles with daily adherence (e.g., on the specific day of planned exercise: acute excuses, attributions, reasons) may influence the decision to exercise and, thus, whether exercise is actually performed.

Meichenbaum and Fong (1993) provided evidence that these two types of cognitions influence noncompliance/nonadherence to health behaviors. Specifically, individuals were asked to explain the reasons why they did not perform a positive health behavior of their choice (e.g., annual medical checkup; flossing teeth). Regardless of the type of behavior, analyses revealed that individuals typically provided three levels of reasons: (a) evidence-based: individuals assessed the evidence relating to whether they should follow health-related advice and did not agree with it, (b) self-relevant: individuals provided a variety of reasons for not performing the health behavior (e.g., not having the time, concern with negative consequences of performing the behavior), and (c) affective schema-related: highly affectively charged, schema-related beliefs that encouraged individuals not to perform the behavior (e.g., avoidance, helplessness, fear).

According to Meichenbaum and Fong (1993), the first type of reason arises from faulty

judgement or knowledge, the second type from consideration of various barriers or costs to performing the behavior, and the third type from more stable, cognitive affective schemas. They suggest that the first two types of reasons are amenable to change because immediate and effective counterarguments can be made. In contrast, affective schema-related reasons are very hard to change because of their deep-rooted, psychological stability. Meichenbaum and Fong (1993) also suggest that interventions aimed at encouraging the adoption and/or maintenance of health behaviors should match the type of reason(s) provided by individuals for their noncompliance/nonadherence. This study suggests that both relatively stable beliefs and cognitions (e.g., schema-related beliefs) and relatively acute cognitions (i.e., evidence-based; self-relevant) may be important to examine in the health and exercise domains.

In these domains, the majority of research has examined the relatively stable beliefs and cognitions. For example, social cognitions such as self-efficacy, outcome expectancies, attitudes, perceived control, and perceived benefits have been investigated (e.g., self-efficacy in the exercise domain: see McAuley & Mihalko, 1998 for a review; perceived barriers and perceived benefits: Myers & Roth, 1997; outcome expectancies/incentives: see McCullagh & Noble, 1998 for a review). Generally, social cognitions are investigated within a larger theoretical framework or model such as the theory of planned behavior (Ajzen, 1985), self-efficacy theory (Bandura, 1997), and the health belief model (Janz & Becker, 1984). In general, this research has concluded that although these cognitions are relatively stable, they can change over time (e.g., eight weeks: DuCharme & Brawley, 1995). Furthermore, these aforementioned cognitions generally operate to either positively impact (e.g., high self-efficacy encourages) or negatively impact (e.g., low self-efficacy discourages) exercise intention and

behavior.

Do Acute Cognitions Influence Intent and Behavior?

In contrast to the ample research on the relatively stable beliefs and cognitions, little research has examined the more acute or day-to-day social cognitions (e.g., excuses, attributions, and reasons) that may affect motivated exercise behavior. These types of cognitions may not only be precursors to stable beliefs but they may also immediately influence exercise intention and behavior. Specifically, it has been suggested that acute cognitions or thoughts occur at that juncture when individuals consider whether to translate their initial plan to exercise into action on a day-to-day basis (Kendzierski & Johnson, 1993). They have called this juncture decisional implementation. However, since this juncture consists of acute thoughts and the consideration and weighing of these thoughts as part of the decision-making process prior to the implementation of the decision to act on that day, it is labelled as decision-making in this paper. This label better represents the concepts and processes under study. Acute thoughts that occur at this juncture may either discourage (i.e., acute negative thoughts), promote (i.e., acute positive thoughts) one's decision to exercise as planned, or cause the individual to struggle with indecision about taking exercise action.

The notion that acute thoughts may be important to examine has received attention in the general psychological domain. For example, Muris, Merckelbach, Horselenberg, Sijsenaar, and Leeuw (1997) found that spider phobics had significantly higher levels of spider-related thoughts than non-phobics. Ozer and Bandura (1990) found that as women's thoughts about sexual assault increased, anxiety also increased whereas participation in various behaviors outside of the home (e.g., jogging, walking, going to a social function) decreased.

In the health and exercise domains, of the few studies that have been conducted, the results are thought-provoking. For example, in the health domain, Gil and colleagues found that the negative thoughts of adults with sickle cell disease predicted increased pain levels as well as psychosocial and functional adjustment (Gil, Abrams, Phillips, & Keefe, 1989; Gil, Abrams, Phillips, & Williams, 1992; Gil et al., 1995). In the exercise domain, Kendzierski and Johnson (1993) found that as healthy college students' acute, negative thoughts about exercise (e.g., too tired, too busy) increased, exercise intention and behavior decreased. Furthermore, evidence in the exercise domain suggests that, in some instances, perceived barriers to exercise prompt people to avoid exercise as initially planned (see Brawley, Martin, & Gyurcsik, 1998 for a review). These barriers may be transitory excuses, attributions, and reasons for avoidance or indecision (Brawley et al., 1998). Furthermore, these barriers may arise in response to acute circumstances or they may be well-learned and stable over time. As well, these barriers may be true obstacles (e.g., situational, structural: Bandura, 1986) or they may be cognitions that are used to explain, apriori or post-hoc (e.g., excuses, attributions), nonadherence or noninitiation of exercise (Brawley et al., 1998).

Taken together, the psychological, health, and limited exercise research suggests the possibility that acute thoughts have the potential to influence motivated behavior. Specifically, even though one may (a) have stable cognitions and beliefs regarding the benefits of regular exercise and (b) have plans to exercise later in a specific day, acute thoughts about exercise may still arise to either encourage or discourage the exercise decision and plan. For example, an acute, positive thought about the use of exercise as a tool for helping to reduce daily, personal stress may encourage and strengthen an individual's decision to exercise as planned.

In contrast, an acute, negative thought about fatigue may discourage an individual's decision to exercise.

Perspectives from Social Cognitive and Self-Efficacy Theories

Examining this possibility from a theoretical viewpoint sheds some preliminary light on the influence that acute thoughts may have on motivated behavior. Specifically, social cognitive theory (Bandura, 1986) suggests that both the prevalence (i.e., frequency) and the tone (i.e., overall positive or negative) of one's thoughts have influential impacts on motivated behavior. For example, individuals who experience a large number of negative cognitions (i.e., negative thinking) when deciding whether to exercise as planned undermine their motivation for and performance of their exercise. This undermining can occur regardless of the specific type(s) of negative thoughts (e.g., true barriers, negative outcome expectancies, excuses).

Partial support of this hypothesis, in relation to acute thoughts, exists in the exercise domain. Recall that Kendzierski and Johnson (1993) found that the frequency of negative exercise-related thoughts was negatively correlated with exercise intention and behavior. However, this evidence begs additional questions. Are acute, positive thoughts positively correlated with exercise intention and behavior? Do positive thoughts buffer or counteract the impact of negative thoughts on motivated behavior? According to social cognitive theory (Bandura, 1986), positive thoughts are important to examine because the overall tone (i.e., positive or negative) of one's thoughts is hypothesized to impact motivated behavior. Thus, examination of how the total of acute positive and negative thoughts collectively influence individuals' decisions to exercise is needed.

Thus, a purpose of the first study in this dissertation was to explore whether the

experience of acute or day-to-day positive and negative thoughts that individuals experienced as a function of deciding whether to exercise influenced their intention and behavior.

Furthermore, exploration of how this influence occurred was conducted. Social cognitive and self-efficacy theories (Bandura, 1986; 1997) suggest that acute positive and negative thoughts may influence exercise intention and behavior indirectly. That is, acute thoughts may influence self-efficacy beliefs. This influence occurs because individuals think about and visualize possible scenarios when considering whether to perform a given behavior (e.g., exercise). Depending on the frequency of thoughts and their overall tone (positive or negative), self-efficacy beliefs may be positively or negatively impacted. For example, behavioral self-efficacy may be undermined in individuals who have primarily acute negative thoughts (e.g., too much to do; not motivated) about an upcoming action (e.g., exercise). In turn, self-efficacy would be expected to negatively impact behavioral intention and behavior (self-efficacy theory: Bandura, 1997).

If it is found that individuals who have primarily positive thoughts (i.e., positive thinkers) also have high behavioral self-efficacy, exercise intention, and behavior, and that individuals who have primarily negative thoughts (i.e., negative thinkers) express lower amounts of these variables, then an interesting research question would follow. Specifically, it would be interesting to determine whether individuals exert efforts to cope with their acute, negative thoughts when deciding about planned exercise. The implication that would arise from evidence favouring self-regulation of acute thoughts (i.e., individuals exert coping attempts and successfully overcome their acute negative thoughts) would be that any detrimental, acute, thought-related impact on exercise intention and adherence could be

prevented. In contrast, if individuals are unable to cope with their acute negative thoughts, then an unwanted, detrimental, acute, thought-related impact on intention and behavior could result.

Perspectives from Coping Theory

One theory which may illuminate the process involved in attempting to cope with acute, negative thoughts is coping theory (Lazarus & Folkman, 1984). In this theory, coping is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). Negative thoughts are one type of internal demand with which individuals attempt to cope. In the general psychology domain, research has shown the benefits of coping with negative thoughts. For example, Dua and Price (1993) found that a four-week intervention designed to teach healthy adults a method for coping with negative thoughts (i.e., a negative thought reduction or a positive thought replacement intervention) resulted in significantly lower postintervention thought-related distress.

According to coping theory (Lazarus & Folkman, 1984), people generally cope with an internal or an external demand through the exertion of behavioral and/or cognitive efforts. For example, if an individual thinks that she is too tired to exercise on a particular day, she may take a nap prior to exercise (i.e., a behavioral effort) and/or she may think that the exercise will wake her up (i.e., a cognitive effort). Regardless of the specific behavioral and cognitive coping efforts, coping theory (Lazarus & Folkman, 1984) hypothesizes that all coping efforts fall into two major categories depending on their aim. The first category is problem-focused coping. This category encompasses all behavioral and cognitive coping efforts aimed at

managing or altering the demand. The second category is emotion-focused coping. This category encompasses all behavioral and cognitive coping efforts aimed at regulating emotional responses to the demand. The former category of coping proliferates when the demand is perceived as being within the control of individuals. In contrast, the latter category proliferates when a perceived lack of control over the demand exists and, thus, people attempt to control their reactions to the demand.

In attempting to cope with thoughts, emotion-focused coping would be expected to be employed when thoughts are perceived as being uncontrollable. These uncontrollable thoughts normally exist only as central manifestations of various disorders such as obsessive-compulsiveness and post-traumatic stress (Wells & Davies, 1994). Such thoughts typically occur on a persistent basis (Purdon & Clark, 1994). In contrast, the use of problem-focused coping would be expected when individuals attempt to cope with their acute, negative, exercise-related thoughts. Specifically, exercisers should perceive some level of control over these more acute, day-to-day thoughts and these thoughts would be distinct from the more persistent thoughts associated with psychological disorders.

In sum, coping theory (Lazarus & Folkman, 1984) suggests that individuals attempt to cope with demands through a variety of behavioral and cognitive efforts/strategies. Clearly, in the exercise domain, identifying the specific types of strategies that exercisers employ in their attempts to cope with acute, negative thoughts would provide valuable qualitative information. To date, such an identification has not been conducted within the theoretical framework of coping theory (Lazarus & Folkman, 1984) in the exercise literature. Furthermore, it has been suggested that it may also be useful to identify the specific strategies out of the multitude that

exercisers believe to be the most effective (cf. Aldwin & Revenson, 1987). Doing so may aid coping researchers in the dissemination of general guidelines to help exercisers cope with their negative thoughts.

Coping: Response Efficacy and Self-Efficacy

Exercisers' beliefs about the effectiveness of their coping efforts is termed coping efficacy (see Aldwin & Revenson, 1987; Keefe et al., 1997). Coping efficacy is defined as an individual's "perception that the coping effort was successful in achieving the individual's goal in a particular situation" (Aldwin & Revenson, 1987, p. 339). For example, in the exercise domain, one goal of a coping effort may be to reduce the impact of acute, negative thoughts on decisions to exercise. Within self-efficacy theory (Bandura, 1997), this type of efficacy is conceptualized as a measure of response efficacy. Specifically, coping response efficacy is a measure of one's belief that a particular mean (i.e., a behavioral or cognitive coping strategy) produces a particular end (i.e., reduces the impact of acute, negative thoughts).

Although coping response efficacy has not been examined in the exercise domain, evidence from other domains suggests that coping response efficacy may be an important belief to possess. For example, in the health domain, Keefe et al. (1997) found that in an arthritic sample, as efficacy in the methods used to cope with pain increased, reported pain and negative mood decreased. This evidence suggests it may be important for individuals to have not only the means to cope but also to believe in the response efficacy of these means. The importance of these two factors has also been highlighted in the chronic pain area. Specifically, it has been suggested that interventions designed to rehabilitate individuals with chronic pain should include two components (Turk, 1999). First, the intervention should teach individuals the

strategies that they can employ for responding to problems associated with chronic pain.

Second, the intervention should convince the individuals that the strategies will be of benefit.

For those interested in encouraging/changing exercise adherence, identification of the behavioral and cognitive means exercisers use to cope with their negative thoughts and the associated efficacy of those means seems appealing. However, this has received little attention to date. Thus, a purpose of the second study in the current series was to: (a) identify the strategies that exercisers employed in their attempts to cope with their acute, negative thoughts when deciding whether to exercise, (b) determine the degree of confidence exercisers had about the effectiveness of these strategies (i.e., coping response efficacy), and (c) investigate the relationship between coping response efficacy and exercise intention.

If preliminary evidence indicates that coping response efficacy is influential (e.g., predicts exercise intention), then another theoretically-based investigation would be needed. This is because such evidence would suggest that exercisers perceive some benefit to having the means (i.e., coping strategies) to cope with their thoughts (i.e., an end). However, having a high coping response efficacy does not ensure that a coping effort will be exerted. Rather, self-efficacy theory (Bandura, 1997) suggests individuals must also believe that they (i.e., the agent) have the abilities to execute the coping strategies (i.e., the means). This latter belief is termed coping self-efficacy and it is clearly distinct from coping response efficacy. That is, coping self-efficacy is concerned with beliefs about the agent and the means. In contrast, coping response efficacy is concerned with beliefs about the means and the end. Both type of beliefs are important to possess because they enhance subjective perceptions of control over coping with acute, negative thoughts (see DuCharme, Gyurcsik, Culos-Reed, & Brawley, in press;

Skinner, 1996 for reviews of perceived control; Turk, 1999). The perception of coping self-efficacy should encourage active attempts to cope because individuals perceive that they can exert some coping effort (i.e., behavioral or cognitive) that allows them to overcome their negative thoughts and decide to exercise as planned (cf. Skinner, 1996).

Thus, in the examination of coping with acute, negative thoughts in the exercise domain, investigation of coping self-efficacy would be beneficial. Self-efficacy theory (Bandura, 1997) suggests that individuals will exert a coping action when they (a) have the skills at their disposal to perform the action and (b) are efficacious that they can effectively use these skills. For example, one may have an acute, negative thought, such as thinking that one does not have the energy to exercise, when deciding whether to exercise as planned. In an attempt to cope, one must know how to attempt to cope with the thought (i.e., use a behavioral or cognitive coping strategy) and one must be confident that one has the ability to employ the coping strategy.

Self-efficacy theory (Bandura, 1997) also suggests that if individuals have high levels of coping self-efficacy, they will exert greater and more persistent coping actions. The benefits arising from such actions are clear. Specifically, exercisers should experience a greater success in overcoming their acute, negative thoughts. This success should then lead to an increase in a variety of outcomes such as exercise intention, behavior, and positive affect (self-efficacy theory: Bandura, 1997). Evidence of the relationships between coping self-efficacy and these outcomes would provide valuable information on the predictive validity of the coping self-efficacy construct in the exercise domain.

Providing evidence of the predictive validity of the coping self-efficacy construct is also

important from another standpoint. If the eventual goal of research is to design an intervention aimed at enhancing exercise intention, positive affect, and, perhaps most importantly, exercise adherence, then the first step must be to provide evidence that coping self-efficacy is predictive of these outcomes (see Baranowski, Anderson, & Carmack, 1998). The second step would be to provide evidence that an intervention is capable of altering coping self-efficacy (Baranowski et al., 1998).

Baranowski et al.'s (1998) suggestions raise the question of what components should be included in an intervention designed to alter coping self-efficacy? According to self-efficacy theory (Bandura, 1997), four main determinants are capable of altering self-efficacy beliefs: (a) enactive mastery experiences, (b) vicarious experiences, (c) verbal persuasion, and (d) physiological and affective states. First, mastery experiences are obtained through performance accomplishments and are the most influential determinant of self-efficacy beliefs. Mastery experiences are so influential because they provide direct evidence of one's ability to successfully carry out effective courses of action. Second, vicarious experiences are obtained through modelling. The extent to which vicarious experiences influence self-efficacy depends on the individual's perceived similarity to the model. That is, the more similar the model is perceived to be, the more that self-efficacy will be influenced. Third, verbal persuasion reflects approaches used to convince individuals that they possess the capabilities to succeed in a given domain. Fourth, physiological and affective states produce somatic information that individuals rely upon when appraising their self-efficacy in a given domain. For example, one may perceive that one's racing heart, profuse sweating, and extreme feelings of nervousness when shooting a basketball free throw are indicants of one's inability to successfully shoot the

ball.

Since all four determinants are capable of altering self-efficacy, inclusion of any one or any number of these determinants in an intervention would be suitable. Evidence from the health, exercise, and sport domains has illustrated the effectiveness of these determinants in altering various forms of behavioral self-efficacies. For example, in the health domain, Rejeski, Ettinger, Martin, and Morgan (1998) investigated whether an aerobic exercise or a resistance training intervention (i.e., mastery experiences) enhanced self-efficacy for stair climbing in individuals with osteoarthritis. It was found that individuals in the aerobic and resistance-training exercise groups had significantly higher self-efficacy than those in the control group.

Although no interventions have been designed to manipulate coping self-efficacy in the exercise domain, research in the general psychology domain provides preliminary evidence that the determinants of coping self-efficacy are similar to those proposed for behavioral efficacies. Specifically, Ozer and Bandura (1990) implemented a 5-week combined mastery and modelling intervention in order to enhance women's efficacy for coping with a sexual assault attempt by an unarmed assailant. They found that the women's efficacy for coping with negative thoughts about sexual assault was significantly higher at postintervention.

In sum, information is needed on the predictive validity of the coping self-efficacy construct in the exercise domain. According to self-efficacy theory (Bandura, 1997), coping self-efficacy would be expected to predict exercise intention, behavior, and affect. If such relationships are found, then the benefits of being able to manipulate exercisers' coping self-efficacy are clear. Thus, the third study in this dissertation investigated whether (a) the strength

of exercisers' self-efficacy for coping with acute, negative thoughts could be manipulated by a hypothesized determinant of self-efficacy beliefs (i.e., a verbally persuasive communication) and (b) coping self-efficacy directly influenced the social cognitive aspects of the decision-making process, exercise intention, behavior, and affect.

STUDY ONE

Influence of Acute Positive and Negative Thinking on Motivated Exercise Behavior

The primary objective of this study was to examine whether the experience of acute or day-to-day cognitions that result as a function of deciding whether to exercise influences exercise intention and behavior of individuals. Acute thoughts are important to examine because they may not only be precursors to stable beliefs (e.g., attitudes) but they may also immediately impact upon whether individuals exercise as planned. Kendzierski and Johnson (1993) provided preliminary evidence about the frequency and the tone (i.e., positive or negative) of acute thoughts that suggested their importance for motivated exercise behavior. They found that the frequency with which college students experienced acute, negative thoughts was negatively correlated with exercise intention and behavior. However, it has been suggested that individuals also experience acute, positive thoughts (Bandura, 1986; Maddux et al., 1995). Further, contentions from self-efficacy theory (Bandura, 1997) suggest that thoughts indirectly impact upon exercise intention and behavior. Specifically then, the overall frequency and tone of thoughts influence self-efficacy beliefs. These beliefs influence intention and behavior.

The specific purposes of the current study were to investigate (a) the acute, exercise-related thoughts that result as a function of deciding whether to exercise, (b) the relationship between these acute thoughts, self-efficacy, exercise intention, and behavior, and (c) if the self-efficacy, intention, and behavior of exercisers who had mainly positive thoughts when deciding whether to exercise differed from those who had mainly negative thoughts.

Acute Thoughts

Minimal exercise research has examined the influence that acute thoughts have on exercise intention and behavior. These thoughts occur at that juncture when individuals consider whether to engage in planned exercise and typically involve consideration of the pros (e.g., acute, positive thoughts) and the cons (e.g., acute, negative thoughts) of performing the behavior (e.g., exercise; Kendzierski & Johnson, 1993; Maddux et al., 1995). This cognitive rumination process is activated when exercise behavior is not habitual and individuals struggle to adopt, change, or maintain a regular pattern of activity (Bandura, 1997; Maddux et al., 1995). In these situations, social cognitive theories (e.g., theory of planned behavior: Ajzen, 1985; health belief model: Janz & Becker, 1984; social cognitive theory: Bandura, 1986) suggest that an individual's intentions to carry out planned exercise may be influenced by both positive thoughts (e.g., benefits, positive outcome expectancies) and negative thoughts (e.g., barriers, excuses) about the behavior. For example, when contemplating bicycling as an exercise for a given day, an individual who has a high number of acute, negative thoughts (e.g., too tired, not motivated, no time) and very few acute, positive thoughts (e.g., feel more energetic after exercising) may ultimately decide against the ride that day.

Social cognitive theory (Bandura, 1986) suggests that the valence or overall tone (i.e., negative, positive) of one's thoughts has an influential impact on motivated behavior. For example, individuals who experience negative cognitions (e.g., negative thinking) when deciding whether to undertake a behavior undermine their motivation for and actual performance of a behavior. This impact can occur regardless of the type of negative thoughts (e.g., true barriers versus excuses) that one experiences. For example, if various types of

negative thoughts (e.g., thoughts about true barriers, negative attributions and excuses) influence an individual's subjective perceptions of control over a behavior (e.g., self-efficacy), then it is important to examine the overall influence of these thoughts. Thus, examination of how the sum total of acute negative and positive thoughts collectively influence an individual's decision to carry out exercise may be important in understanding the relationship between thoughts that precede an eventual behavior and performance of the behavior.

Acute thoughts are not new social cognitive variables. Negative and positive cognitions have been and will continue to be examined within the context of the beliefs associated with various social cognitive theories (e.g., expected benefits, perceived barriers: theory of planned behavior, Ajzen, 1985; perceived benefits of recommended behavior, perceived barriers to action: health belief model, Janz & Becker, 1984). Within these models, beliefs about outcomes, ability, or control are assumed to be relatively stable and, as a result, have been used to predict behavior for a specific time period (e.g., one month). Typically, the protocol for assessment of beliefs requires individuals to indicate the strength of their response to a particular belief in relation to its operation for a specific, longer time period (e.g., barriers: Godin & Gionet, 1991; benefits and barriers: Myers & Roth, 1997; outcome expectancies: Theodorakis, 1994).

However, as previously suggested (Kendzierski & Johnson, 1993; Maddux et al., 1995), it may also be important to examine more acute thoughts that occur around the immediate time and quite probably as a function of when one is contemplating and deciding whether to exercise. Thus, a means of assessing these acute cognitions needs to be developed. The next section reviews the specific features of acute, exercise-related thoughts that should be part of

an assessment.

Measurement of acute thoughts. Since both the prevalence (i.e., frequency) and the tone (i.e., negative, positive) of various acute thoughts (i.e., sum total of barriers, cons, benefits, etc.) may operate in concert to affect motivated behavior (Bandura, 1986), these two aspects should be assessed. Acute, positive thoughts can be defined as those that encourage an individual's immediate decision to carry out upcoming exercise as planned (e.g., benefits, pros, positive outcome expectations), while acute, negative thoughts can be defined as those that hinder an individual's decision to exercise (e.g., barriers, excuses, cons).

In one of the first attempts to measure and study the influence of acute thoughts in the exercise setting, Kendzierski and Johnson (1993) examined the relationship between the number of negative thoughts that individuals experienced when deciding whether to exercise and their exercise intention and behavior. They developed a 25-item Exercise Thoughts Questionnaire (ETQ) to identify frequent, negative exercise thoughts. Some example thoughts from the ETQ were: "I'm too tired to exercise," "I haven't got the time," and "It will take a lot of energy." Respondents were administered the ETQ and they indicated the frequency with which they had each thought in the last week when considering whether to exercise on a 1 (not at all) to 5 (all the time) scale. A summed score for the thought frequency scale was obtained.

For healthy college students, Kendzierski and Johnson (1993) found that the frequency of negative exercise thoughts in the last week was negatively correlated with exercise intention and self-reported behavior during that week, as well as with self-reported exercise behavior three months later. While this initial study suggests that a relationship exists between acute retrospective negative thoughts and exercise intention and behavior, the results must be

considered in light of three measurement issues.

First, the actual frequency with which students had negative exercise thoughts was not clear because the ETQ scale required a scaled categorical response rather than requiring respondents to provide specific thought frequencies. Thus, the frequencies that respondents considered as representing scale endpoints may have varied greatly. Second, summing all 25 negative thoughts may not have accurately reflected thought impact. Specifically, participants responded to all 25 thoughts as though they were equally important and therefore, the sum may have considered a majority of thoughts that either did not apply or differed in the weight of their impact (e.g., high thought frequency but low impact). As a result, the impact of a few, highly frequent and influential thoughts may have been diluted. Third, Kendzierski and Johnson (1993) suggested that the close-ended nature of the ETQ restricted a response about potentially influential negative thoughts not on the list. A related issue is that the ETQ only queried respondents about negative thoughts thereby excluding the potential buffering influence of salient, positive thoughts.

Thus, in the present study, open-ended measures were used to assess acute, retrospective and prospective exercise-related thoughts. The advantage to employing open-ended measures was that exercisers were used as active-agents (Sherif & Sherif, 1969) in the identification of salient, acute thoughts. The use of an active-agents approach allowed exercisers to identify salient acute thoughts without constraining whether they were all negative, all positive, or some combination of these two types. This was in contrast to requiring exercisers to respond to an investigator-provided list that may not have included all thoughts that were salient to all participants or that imposed acute thoughts that were not

important.

Both acute retrospective and prospective thoughts were important to assess because of contentions from social cognitive theory (Bandura, 1986). According to the principle of reciprocal determinism, since inner personal (i.e., cognition, emotion, biological events), behavioral, and environmental factors continually and interactively operate to affect each other, an individual's actions (e.g., exercise) at a certain point in time may arise from both past and anticipated future sources or events. Thus, consideration of how (a) retrospective and (b) prospective exercise thoughts influence motivated exercise behavior may help in the understanding of exercise adherence. Further, consideration of whether retrospective and prospective thoughts exert a similar pattern of influence on these variables may provide insight for future research (e.g., assess immediate acute thoughts – past and present – on the same measure if these patterns of influence are similar).

Relationship of acute thoughts to exercise intention and behavior. Kendzierski and Johnson (1993) suggested that a clearer picture of thought impact may emerge through examination of whether acute thoughts affect social cognitions (i.e., other than exercise intention) that may be important for exercising. According to Bandura (1986; 1997), one such variable may be self-efficacy beliefs. Specifically, self-efficacy beliefs may be influenced by the myriad of negative and positive thoughts or cognitive simulations that one experiences when deciding whether to undertake a specific behaviour (i.e., these thoughts are a source variable for efficacy). Specifically, since individuals have a high capacity for symbolic cognitive activity, they are able to think about and visualize possible scenarios when considering whether to perform a given behavior (e.g., exercise). Depending on the content

(e.g., successful or unsuccessful) and the tone (e.g., positive or negative) of this cognitive representation, efficacy beliefs may be positively or negatively impacted. For example, behavioral self-efficacy may be undermined in individuals who have primarily negative thoughts about an upcoming action. As a result, motivation and performance of the behavior may then be negatively impacted (Bandura, 1986; 1997). These hypothesized relationships between acute thoughts, self-efficacy, exercise intention, and behavior were examined in the current study.

Summary

Research is needed to examine whether the prevalence (i.e., frequency) and the tone (i.e., negative, positive) of the acute thoughts that one has as a function of deciding whether to exercise is predictive of efficacy and whether efficacy is predictive of subsequent motivated exercise behavior. As a result, this research must begin by examining nonhabitual exercisers who would engage regularly in a decision-making processes about whether to exercise but who struggle with carrying out the final action. Such individuals should engage in active forethought and rumination about their actions which may include thoughts about challenges, obstacles, and self-doubt (Bandura, 1997; Maddux et al., 1995). These individuals can range from beginner exercisers to exercisers who adhere regularly but not perfectly (i.e., not all the time). Although this latter group may exercise regularly, it has been suggested that they continue to engage in conscious decision-making of whether to exercise due to the complex social cognitive and behavioral (e.g., scheduling exercise) precursors to exercise behavior (Maddux, 1997). These individuals are in contrast to habitual exercisers who do not typically engage in conscious decision-making about exercise unless some obstacle or hindrance arises

(Maddux et al., 1995). It is important to note that the idea that regular exercise ever becomes a habitual behavior has been recently questioned because of the high degree of practice and planning that goes into exercising (see Maddux, 1997). Thus, including a range of exercisers (i.e., beginner to regular) in the investigation of acute, exercise-related thoughts is warranted because they all engage in conscious decision-making.

Research should also address the measurement issues arising from Kendzierski and Johnson's (1993) study by having respondents indicate how frequently they experience salient negative and positive retrospective and prospective thoughts. This would offer the opportunity to determine whether the frequency with which exercisers experience acute negative and positive thoughts is about equal or whether exercisers adopt either a negative or a positive approach to their thinking.

In sum, the purpose of the current study was to determine if the frequency of acute exercise thoughts (i.e., retrospective, prospective) experienced by participants was related to self-efficacy beliefs, intentions, and exercise behavior. Specifically, two hypotheses consistent with self-efficacy theory (Bandura, 1997) were tested. The first hypothesis was that acute thoughts were predictive of self-efficacy (i.e., retrospective and/or prospective thoughts predicted efficacy) and the second hypothesis was that self-efficacy predicted intention and behavior. A related study objective was to determine if the social cognitions (i.e., self-efficacy, intention) and behavior of those who had mainly positive thoughts when deciding whether to exercise differed from those who had mainly negative thoughts.

Method

Participants

Participants in this study were 82 healthy adults between the ages of 18 to 49 with a mean age of 23.7 years ($SD = 5.8$ years). University students composed 93% ($n = 76$) of the sample while individuals from professional, managerial, and technical occupations characterized the remaining 7% ($n = 6$). Seventy-six (93%) of the volunteers were female which was similar to the majority of individuals studied in previous structured aerobic class research. All study volunteers were enrolled in a 10 week aerobic exercise program with classes being offered either two or three times per week. Immediately prior to enrolment, the participants' exercise history varied with 70% ($n = 57$) regularly exercising and the remaining 30% ($n = 25$) being completely inactive. Of those participants who had a history of regular exercise, 20% ($n = 16$) were enrolled in structured aerobic classes, 17% ($n = 14$) were involved in unstructured exercises (e.g., weights, biking) at health clubs, and 33% ($n = 27$) were exercising on their own.

Measures

In order to address the previously outlined measurement issues, open-ended measures of acute positive and/or negative thoughts were developed. The measures were specific to the context of the 10 week aerobic exercise program.

Retrospective exercise thoughts measure (RET). This measure required participants to (a) list the three most frequent thoughts they had during the past week when deciding whether to attend their scheduled aerobic classes and (b) indicate how frequently they had each specific thought. These instructions permitted participants to list their three most salient thoughts

without constraining whether they were all negative, all positive, or some combination of the two. An overall frequency score from the RET was obtained by subtracting the total number of negative thoughts from the total number of positive thoughts. For example, if an individual listed two positive thoughts and responded that each occurred twice (i.e., positive sum = 4) and one negative thought that occurred twice (i.e., negative sum = 2), the overall thought frequency value would have been two (i.e., positive sum - negative sum: $4 - 2 = 2$). This procedure for determining thought frequency has been employed in previous research (see Shapiro, 1994 for a review of thought-list procedures in psychology).

Prospective exercise thoughts measure (PET). This measure required participants to (a) list the three most frequent thoughts they anticipated having in the upcoming week when deciding whether to attend their scheduled classes and (b) indicate how frequently they expected to have each thought. Similar to the RET, participants could potentially list all positive thoughts, all negative thoughts, or some combination of the two. An overall thought frequency score was calculated in the same manner as the overall RET frequency score. Given that this assessment was made after the participants had exercised in their current program for two months, they had experience which formed the basis for prospective thoughts.

Self-efficacy (SE). This instrument measured participants' efficacy in their abilities to attend their scheduled aerobic classes in the next three weeks after considering their listed thoughts (i.e., RET or PET). Thus, self-efficacy was assessed twice; once each for the RET (SE_{RET}) and PET (SE_{PET}). Efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale. In recent measurement reviews, the specificity of measurement has been emphasized as important in reducing measurement error and heightening salience

when participants respond to questions about the efficacy they have for their abilities. Thus, time, context, and action were mentioned as part of each efficacy item (cf. Brawley et al., 1998; McAuley & Mihalko, 1998).

Behavioral intention (BI). Exercise intention was obtained using a measure of the participants' behavioral self-prediction (cf. Fishbein & Stasson, 1990). First, they indicated how many times per week they would attend their scheduled aerobic classes by filling in the statement "I will attend my aerobics class ____ times per week in the next 3 weeks." Then, the strength of this behavioral self-prediction statement was indicated on a 1 (definitely will not) to 9 (definitely will) scale. The latter strength value was used in subsequent analyses and its tie to frequency maintained scale correspondence with the dependent measure of exercise attendance behavior (cf. Courneya & McAuley, 1993).

Exercise attendance (ATTD). Exercise attendance at scheduled aerobic classes over a three week period, beginning immediately after questionnaire completion, served as a measure of exercise behavior. As required by the program, participants recorded their attendance on sheets located in the aerobic rooms at the end of each class. Periodic checks after each class by the investigators and daily monitoring by instructors ensured that this procedure was being followed by each participant. To standardize the unequal maximum number of weekly sessions available to participants (i.e., two or three times per week), the mean percentage of weekly attendance was calculated and used in subsequent analyses.

Procedure

Measures were obtained at the beginning of week seven of a 10 week aerobics program to ensure that adherent participants had sufficient experience with the program to form the

basis of thoughts and social cognitions regarding their current exercise behavior (cf. Bandura, 1997; McAuley & Mihalko, 1998). Each questionnaire included a background information section, followed by the RET, related efficacy, PET, related efficacy, and BI measures as previously described (see Appendix A for the questionnaire). The questionnaires were administered at the end of each aerobics class by one of the investigators. Questionnaires were completed at this time and returned to the investigator. A small number of respondents ($n = 15$) returned the questionnaire within two days of administration in a designated drop box located in the fitness area. There were no anomalous questionnaire responses in comparison of this group with the remainder of the sample.

Attendance was recorded continuously for the subsequent 3 weeks. Similar to previous studies (e.g., DuCharme & Brawley, 1995) and after considering issues raised by Perkins and Epstein (1985), adherers were behaviorally differentiated from dropouts using the following criterion: dropouts were those who missed two consecutive weeks of exercise classes with no subsequent return. This group was excluded from the analyses since the focus of the investigation was on exercise adherence.

Results

Descriptives

At the end of the data collection period, 56 of the 82 respondents were classified as adherers to the fitness program. Of these adherers, 80% were not previously participating in structured fitness classes (i.e., 15 were inactive and 30 were exercising on their own). The remaining 20% ($n = 11$) were not considered to be habitual fitness class exercisers because they were able to complete the social cognitive measures. In contrast, as suggested by Maddux et al.

(1995), habitual exercisers do not typically engage in controlled cognitive processing and thus would have experienced great difficulty in completing the social cognitive assessments.

Retrospective exercise thoughts. Retrospective thoughts were classified as either positive or negative by researchers who were knowledgeable about the social cognitive literature in the exercise domain. In a fashion similar to Kendzierski and Johnson's (1993) study, negative thoughts were defined as those thoughts that may have hindered one's decision to attend fitness classes as planned (i.e., barriers, excuses, cons, negative outcome expectancies). Positive thoughts were defined as those thoughts that may have encouraged one's decision to attend scheduled fitness classes (i.e., benefits, pros, positive outcome expectancies). In order to ensure that these two types of thoughts were measured accurately and were conceptually distinct from the attendance self-efficacy construct (i.e., not confounding the two measures), any respondent who provided either positive or negative thoughts about their abilities to attend fitness classes (i.e., positive: being able to make the class time; negative: not being able to attend the class because it was at a bad time) did not have their data used in analyses of the retrospective thought measure. As a consequence, the data from only two subjects were excluded. These negative and positive operational definitions resulted in the identification of 15 different thoughts.

Specifically, 52% ($n = 29$) of the participants had at least one positive thought and, in total, seven different positive thoughts were listed. As seen in Table 1, positive short and longer-term physical and psychological outcome expectancies or benefits of exercising, motivational, social, or affective (i.e., enjoyment) type thoughts were identified. On average, respondents estimated that each of the positive thoughts that they provided occurred three times

(SD = 1.32) during the previous seven days when they were deciding about exercise.

In contrast, 77% (n = 43) of the respondents experienced at least one negative thought. Across these participants, eight different negative thoughts were identified and, as seen in Table 1, the most frequent thoughts were similar to those characterized as barriers or excuses in past studies (see Brawley et al., 1998 for a review) or were motivational in nature. Each of these thoughts occurred, on average, two times (SD = 1.30) during the previous week when they were deciding about exercise.

Overall, participants had more negative than positive thoughts when they deciding whether to exercise. Specifically, an overall mean thought frequency of -0.32 (SD = 5.79; n = 50) was obtained and this value ranged from a low of -12 (i.e., high frequency of negative thoughts) to a high of 19 (i.e., high frequency of positive thoughts).

Prospective exercise thoughts. Prospective positive and negative thoughts were classified in the same manner as previously outlined for the retrospective thoughts. One respondent who had two thoughts involving abilities to attend fitness classes (i.e., efficacy-related thoughts) was excluded from subsequent analyses of the prospective thought data. In total, 15 thoughts were identified. Recall that these exercisers had seven weeks of experience that served as the basis for their anticipation.

Specifically, 38% of respondents (n = 21) expected to have at least one positive thought. As seen in Table 1, eight different thoughts were identified by the sample. The most frequent thoughts were similar to those identified on the retrospective measure. Each of these thoughts was anticipated to occur, on average, four times (SD = 2.56) in the upcoming week.

In contrast, 79% (n = 44) of the respondents anticipated having at least one negative

exercise thought during the subsequent week. In total, seven different negative thoughts were identified with the most frequent thoughts being similar to those identified on the retrospective measure (see Table 1). On average, participants expected to have each negative thought three times (SD = 1.67) during the upcoming week.

The overall thought frequency value from the PET indicated that respondents anticipated more negative than positive thoughts in the next week. Specifically, this value was -1.31 (SD = 7.04; n = 52) and ranged from -28 (i.e., high frequency of negative thoughts) to 17 (i.e., high frequency of positive thoughts).

Table 1

Number of Participants Experiencing Retrospective and Prospective Thoughts

	Retrospective	Prospective
Positive thought	<u>n</u>	<u>n</u>
1. Physical outcomes (i.e., gain muscle, weight loss)	12	11
2. Motivation to exercise	11	8
3. Class enjoyment	10	3
4. General feelings of increased energy	9	6
5. Psychological outcomes s (i.e., stress reduction)	4	6
Negative thought		
1. Physical (i.e., muscle soreness, too tired)	29	18
2. Other specific commitments	26	35
3. General thoughts about lack of time	12	16
4. Instructor-related (i.e., bad instructor)	4	5
5. Lack of motivation to exercise	3	5
6. Clothing attire (e.g., not having proper attire)	3	1
7. Inclimate weather	2	1

Note. Each n represents the total number of participants who experienced the specific thought.

Self-efficacy, intention, and behavior. As might be expected of adherent exercisers, participants were fairly confident in their abilities to attend exercise after considering the thoughts they listed on the (a) RET ($M = 79.80\%$, $SD = 17.72$) and (b) PET ($M = 80.00\%$, $SD = 17.20$). In addition, these adherers had high intentions to attend exercise classes ($M = 7.94$, $SD = 1.24$) which was reflected by their actual attendance rate of 76.83% ($SD = 20.00$).

Comparison of Positive and Negative Thinkers

Retrospective exercise thoughts. Participants who had an overall positive or negative valence that characterized their retrospective thinking when deciding whether to exercise were compared to determine if their social cognitions and behavior differed. Respondents were divided into two extreme groups for analyses. It is important to note that typical extreme group analyses take the upper and lower thirds of normally distributed data which results in equal group sizes. However, the current thought frequency data indicated that more respondents had negative thoughts and, as a result, using the upper and lower thirds to place individuals in groups would have resulted in some respondents who were not clearly positive (i.e., closer to an equal number of positive and negative thoughts) being placed in the positive group. In order to obtain groups who had extreme thoughts (i.e., positive or negative), the cutoff value of minus or plus two was chosen.

Specifically, the rationale for this procedure was that individuals most likely to exhibit characteristic differences in their social cognitions and behavior would be those people most extreme (and different) in their acute thinking about exercise. If such differences could not be detected among these individuals, it seems unlikely that it would be observed in the entire sample. That is, individuals in the middle of the thought frequency distribution who had

similar values would not be expected to give characteristic responses that were a function of their acute thinking. Clearly, this approach does not result in equal group sizes and this was taken into account in the analysis. It is also important to note that this approach maintained a sufficient number of participants in each group to investigate the research question (Tabachnik & Fidell, 1996).

The extreme group split resulted in two groups: (a) positive thinkers who had an overall retrospective thought frequency value of two or greater ($\underline{n} = 13$) and (b) negative thinkers who had an overall retrospective thought frequency value of minus two or less ($\underline{n} = 23$). Those who had an overall frequency value of minus one to plus one (i.e., including zero – an equal number of positive and negative thoughts) were excluded from the groups in order to ensure that the two groups (i.e., plus two and minus two groups) were distinctly different in their acute thinking patterns.

A t -test indicated that these two groups significantly differed on overall thought frequency, $t(17) = -7.08$, $p < .0001$. A one-way between groups MANOVA was then conducted using the type of overall retrospective exercise thinking (positive or negative) as the independent variable and self-efficacy, intention, and attendance as the dependent variables. Assumptions underlying the use of MANOVA were met as indicated by the nonsignificant Levene's and Box's tests ($ps > .01$). The overall MANOVA was significant, $F(3, 32) = 3.50$, Pillai's Trace = .25, $p < .03$. Subsequent univariate F tests revealed that the positive retrospective thinkers had significantly higher self-efficacy, $F(1, 34) = 10.42$, $p < .003$ (power = .88; $\eta^2 = .24$) and exercise attendance, $F(1, 34) = 4.22$, $p < .05$ (power = .52; $\eta^2 = .11$) than the negative retrospective thinkers (see Table 2 for means). Interestingly, exercise intention

did not significantly differ between the two groups, $F(1, 34) = 2.68, p < .11$ (power = .36; $\eta^2 = .07$) (see Table 2 for means).

Prospective exercise thoughts. Overall positive ($n = 14$) and negative ($n = 31$) prospective thinkers were grouped in the same manner and with the same rationale as outlined above for the retrospective measure. These two extreme groups significantly differed on their mean frequency of prospective thoughts, $t(46) = -8.24, p < .0001$. Subsequently, a one-way between groups MANOVA was conducted using the type of overall prospective exercise thinking (positive or negative) as the independent variable and self-efficacy, exercise intention, and attendance as the dependent variables. A significant Levene's test ($F = 8.19, p < .01$) indicated that the variances of self-efficacy for the two groups were unequal. Since these data were negatively skewed, they were transformed (i.e., reflected and square rooted: Tabachnik & Fidell, 1996) and subsequent Levene's and Box's tests were nonsignificant ($ps > .05$) which indicated that the assumptions underlying the use of MANOVA were met.

The overall MANOVA was significant, $F(3, 41) = 5.04$, Pillai's Trace = .23, $p < .01$. Similar to the retrospective findings, univariate F tests revealed that the positive group had significantly higher self-efficacy, $F(1, 43) = 13.10, p < .001$ (power = .94; $\eta^2 = .23$), and exercise attendance, $F(1, 43) = 4.63, p < .04$ (power = .56; $\eta^2 = .10$), than the overall negative group (see Table 2 for means). Once again, these two groups did not significantly differ on exercise intention, $F(1, 43) = 2.90, p < .10$ (power = .39; $\eta^2 = .06$) (see Table 2 for means).

Table 2

Means for Overall Positive and Negative Thinkers

Variable	Retrospective		Prospective	
	Positive	Negative	Positive	Negative
	<u>M</u>	<u>M</u>	<u>M</u>	<u>M</u>
Self-efficacy	91.54*	72.17*	92.14*	73.87*
	(14.05)	(18.82)	(10.51)	(17.45)
Behavioral intention	8.38	7.70	8.36	7.68
	(1.19)	(1.22)	(1.01)	(1.33)
Attendance	87.18*	72.70*	86.91*	72.94*
	(15.11)	(22.65)	(18.44)	(20.87)

Note. Standard deviations are reported in parentheses under each mean. For self-efficacy to attend after considering prospective thoughts, original means and standard deviations are reported in the table for ease of interpretation. Recall that these means were transformed to normalize the distribution (i.e., reflected and square-rooted: Tabachnik & Fidell, 1996) and were used in the analysis.

*Within retrospective or prospective groups, row means significantly differed at $p < .05$.

Relationship of Exercise Thoughts to Intention and Behavior

To further examine the relationships between the two measures of exercise thoughts and social cognitive variables as well as between social cognitive variables and rate of exercise adherence, several multiple regression analyses were conducted.¹ Specifically, regressions were conducted to determine if retrospective or prospective thoughts predicted related efficacy. Tests of the ability of each of these efficacies to predict intention and behavior were also conducted.

Lastly, as a secondary analysis to compare results with previous research, hierarchical multiple regression analyses were conducted in order to determine if self-efficacy after considering retrospective thoughts and behavioral intention were independent predictors of exercise attendance. In this analysis, intention was entered first and efficacy second in order to determine if this measure of efficacy contributed unique variance. A parallel analysis was conducted for intent and self-efficacy after considering prospective thoughts. If intention and self-efficacy were independent predictors of exercise adherence, this would agree with results from past exercise research (e.g., Poag-DuCharme & Brawley, 1993) and hypotheses advanced by theory (e.g., theory of planned behavior: Ajzen, 1985; social cognitive theory: Bandura, 1986).

Prediction of Exercise Intention

Retrospective exercise thoughts. The hypothesis that retrospective thoughts were predictive of SE_{RET} was supported. As seen in Table 3, retrospective thought frequency

¹See Appendix B for the bivariate correlations between the (a) RET, related efficacy, intention, and attendance and (b) PET, related efficacy, intention, and attendance.

significantly predicted SE_{RET} (R^2 adjusted = .23). Another regression indicated that respondents' efficacy significantly predicted exercise intention for the subsequent three weeks (R^2 adjusted = .30) (see Table 3).

Prospective exercise thoughts. The hypothesis that prospective thoughts were predictive of efficacy was also supported. As seen in Table 3, the frequency of respondents' anticipated thoughts during the next week when considering exercise significantly predicted SE_{PET} (R^2 adjusted = .11). Another regression indicated that SE_{PET} accounted for a significant 29% of the variance in exercise intention (see Table 3).

Table 3

Prediction of Related Efficacy and Intention

	Predictor	Criterion	R^2 adj.	p	n
1.	RET	SE_{RET}	.23	.0001	50
2.	SE_{RET}	BI	.30	.0001	46
3.	PET	SE_{PET}	.11	.02	51
4.	SE_{PET}	BI	.29	.0001	48

Note. Unequal sample sizes due to listwise deletion. The acronyms are: **RET** = retrospective thought measure; SE_{RET} = self-efficacy to attend after considering retrospective thoughts; **PET** = prospective thought measure; SE_{PET} = self-efficacy to attend after considering prospective thoughts; **BI** = behavioral intention.

Prediction of Exercise Behavior

Retrospective exercise thoughts. Recall that overall retrospective thought frequency predicted SE_{RET} (see Table 3). A subsequent regression indicated that SE_{RET} significantly predicted exercise behavior (R^2 adjusted = .16, $p < .002$; $n = 51$). These findings support predictions based upon self-efficacy theory (Bandura, 1997).

Prospective exercise thoughts. Recall that prospective thoughts significantly predicted related self-efficacy (see Table 3). This efficacy was found to significantly predict exercise behavior (R^2 adjusted = .33, $p < .0001$; $n = 51$) supporting self-efficacy theory hypotheses (Bandura, 1997).

Secondary analyses. An additional hierarchical multiple regression analysis indicated that BI and SE_{RET} were significant independent predictors of actual exercise adherence. Specifically, the overall model using both predictors was significant (R^2 adjusted = .19, $p < .04$; $n = 46$) and both BI and SE_{RET} accounted for significant, independent variation (R^2 change = .14, $p < .01$; R^2 change = .09, $p < .04$, respectively) in the model. Similarly, when attendance was predicted by BI and SE_{PET} , the overall model was significant (R^2 adjusted = .31, $p < .0001$; $n = 48$). Both intention and SE_{PET} were significant independent predictors (R^2 change = .13, $p < .01$; R^2 change = .21; $p < .0001$, respectively).

Summary of Findings

Both the retrospective and the prospective thought measures indicated that respondents experienced a higher frequency of negative than positive thoughts when considering whether to exercise. The one-way between-group multivariate analyses revealed that participants who were clearly positive in their thinking about past and/or future exercise had significantly higher

(a) confidence to attend their fitness classes after consideration of their thoughts and (b) a better attendance rate than those respondents who were clearly negative in their thinking. It should be noted that because all subjects were adherers, self-efficacy and attendance values were well above a 50% level, however, positive thinkers were clearly more confident and had more consistent attendance.

In addition, a priori hypothesized models were tested via multiple regressions. These procedures indicated that both retrospective and prospective thoughts were predictive of related efficacy. In addition, these two efficacy constructs were found to predict exercise intention and behavior. In general, the effect sizes for all of these regression analyses were moderate to strong (Cohen, 1992; Green, 1991).

Finally, secondary analyses revealed that a model testing intention and self-efficacy, based on retrospective thoughts, was significant with each variable contributing unique variance to the prediction of exercise attendance. This was also the case when intention and self-efficacy, based on prospective thoughts, were examined as predictors of exercise attendance. These results agree with others in the published exercise literature (e.g., Gyurcsik, Brawley, & Martin, 1997; Poag-DuCharme & Brawley, 1993) and represent moderate to strong effect sizes (Cohen, 1992; Green, 1991).

Discussion

Findings from the current investigation extend Kendzierski and Johnson's (1993) research which suggested that the acute and frequent negative thoughts experienced when contemplating exercise were important cognitions to investigate. The current study provided initial evidence that individuals had varied and specific types of both negative and positive

thoughts when deciding about immediate exercise and that these thoughts influenced exercise intention and behavior. The majority of acute retrospective and prospective negative thoughts expressed by participants in the present study would typically be classified as being about barriers (e.g., physical, other specific commitments, inclement weather, improper attire) or were expressed as excuses (e.g., general lack of time thoughts) consistent with their labelling in the literature (see Brawley et al., 1998 for a review). The majority of acute retrospective and prospective positive thoughts expressed in this study would be classified as being about positive outcome expectations or benefits (e.g., physical health, acute benefits, psychological benefits).

Typically, these thoughts have been subsumed in the measurement of various beliefs within social cognitive theories. For example, measurement protocols have assessed a stable belief for a specific time period such as one month (e.g., theory of planned behavior: Ajzen, 1985; self-efficacy theory: Bandura, 1997; see Godin & Kok, 1996 for a review). In contrast, the measurement procedure employed in the current study attempted to demonstrate that at the immediate point when individuals are deciding whether to exercise, the sum total (i.e., frequency) and tone of acute thoughts operate in concert to affect motivated behavior. These acute thoughts exert their impact at that moment of decision rather than at a distant point in the future. Whether positive thoughts buffer the impact of negative thoughts on motivated behavior or whether negative thoughts offset the influence of positive thoughts is unknown. Regardless, this finding is supportive of research in the health domain in which the balance of positive and negative thoughts has been found to influence emotions (e.g., dysphoria: Bruch, 1997).

Further insight into the role that acute negative and positive thoughts had on motivated behavior was gained through extreme group comparisons. Recall that individuals who were mainly positive in their thoughts when deciding whether to exercise (i.e., retrospective and prospective) were significantly more confident in their ability to actually attend exercise and had a better rate of adherence than those individuals who thought mainly about the negative aspects of exercising. Although these findings have not been previously investigated, they are supportive of the important role that the tone of one's cognitions have been given in social cognitive and self-efficacy theories (Bandura, 1986; 1997). An interesting speculation is whether adherent individuals whose acute thoughts were primarily negative would have eventually exhibited nonadherence. Alternatively, such adherers may have continued to have strong intentions and developed the strategies to cope with their negative thoughts. If these strategies were successful, they might help individuals maintain their efficacy, and consequently, their physical activity. Although these ideas may be intuitively appealing, they will require future investigation.

Regression analyses in the current study indicated that thoughts were predictive of self-efficacy. Then, self-efficacy was found to predict exercise intention and behavior. Although these findings are based on concurrent data, they are supportive of the contention from self-efficacy theory (Bandura, 1997) that thoughts indirectly influence intention and behavior. These findings suggest that the myriad number of negative and positive thoughts that individuals have when considering exercise has some relationship to their confidence in their behavioral abilities (i.e., attend exercise). Recall that in the current study, only adherers were included in the multiple regression analyses and, of these adherers, 80% were not previously

exercising in structured, regularly scheduled fitness classes (i.e., inactive or exercising on their own). Thus, it is suggested that their recent efficacy beliefs were being developed through mastery experiences (i.e., attending after considering negative and positive thoughts) in their current program. Their confidence in their ability to attend was reflected by the high mean values for self-efficacy which were recorded at week seven of the ten week program.

Finally, the current study's findings that efficacy and intention were significant independent predictors of exercise behavior support other recent exercise research (e.g., Gyurcsik et al., 1997; Poag-DuCharme & Brawley, 1993) and research based upon the theory of planned behavior (Ajzen, 1985; also see Godin & Kok, 1996 for a review). As suggested by Bandura (1997), the move from intention to action is not automatic and other factors, such as self-efficacy, can also affect behavior.

Strengths and Limitations

Findings from the current study have extended previous research on the influence of acute, exercise-related thoughts on exercise intention and behavior. Recall that Kendzierski and Johnson (1993) found that acute, negative thoughts were negatively correlated with exercise intention and behavior. One strength of the current study is that it is the first in the exercise setting to show that exercisers also experience acute, positive thoughts as a function of deciding whether to exercise. A second strength is that preliminary evidence about the way in which thoughts influence intention and behavior was obtained. Specifically, thoughts predicted self-efficacy beliefs. These beliefs predicted exercise intention and behavior. A third strength is that evidence revealed that individuals who differ in the frequency and the tone of their acute thoughts (i.e., positive and negative thinkers) have corresponding differences on exercise-

related social cognitions (i.e., self-efficacy) and the rate of exercise adherence. This suggests that examination of acute, exercise-related thoughts is worthy of continued investigation.

Despite these strengths, consideration of study limitations places the findings into perspective. One limitation is that although significant multivariate effects were detected between negative and positive thinkers, they pertain to a specific, university-based sample and thus are not necessarily generalizable. A second limitation is that generalizability is also limited because the sample of structured aerobic class participants represent mainly female university students although this tends to be the pattern for this type of supervised, structured exercise setting.

Future Directions

Future research should repeat this type of study with a larger and broader sample of exercisers (e.g., unstructured, structured, aerobic, weight trainers, older adults) in order to determine the reliability and generalizability of the observed effects. As well, it would be useful to conduct multiple, prospective assessments of social cognitions and behavior in order to determine whether the observed results are dynamic or stable as participants gain exercise experience and struggle with their acute thoughts and related exercise decisions.

A final future direction is to examine whether individuals exert efforts to cope with their acute, negative thoughts. The current study revealed that negative thinkers had significantly lower self-efficacy and behavior than positive thinkers. Interestingly, the negative thinkers managed to adhere at a fairly high rate (i.e., 73%). This suggests that they may have developed effective strategies to cope with their negative thoughts so that the detrimental impact of their acute, negative thoughts was decreased or negated. Study Two was undertaken

to examine this coping process.

STUDY TWO

Coping with Acute Negative Thoughts: Strategies, Response Efficacy, and Influence on Intention

One purpose of the current study was to identify the strategies that exercisers used to cope with their acute, negative thoughts. A second purpose was to determine the degree of confidence that exercisers had in the effectiveness of their coping strategies in reducing the impact of their negative thoughts. This type of belief is termed coping response efficacy and it is important to examine because individuals are more likely to employ and persist in the use of coping strategies that are perceived to be effective (self-efficacy theory: Bandura, 1997). A third purpose of the current study was to determine if coping response efficacy was predictive of individuals' exercise intentions. A rationale for these purposes follows.

Coping

Coping is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). A key feature of this definition is that coping is conceptualized as process-oriented as opposed to trait-oriented. It is concerned with the acute phenomena related to what one actually thinks and does in specific situations rather than a stable, trait-like behavioral pattern reflective of what a person usually does, would do, or should do (Lazarus & Folkman, 1984). Since coping refers to changing thoughts and actions, static measures of coping would not provide information on the dynamic nature of the coping process. As a result, coping should be examined within a specific context over time so that specific coping processes can be identified (Lazarus & Folkman, 1984).

Thoughts as Internal Demands

As described in the definition, individuals cope with either external or internal demands. A wide range of external demands have been investigated such as coping with physical threats by another individual (e.g., Ozer & Bandura, 1990), evaluation by judges in athletic events (e.g., Gould, Finch, & Jackson, 1993), and medical procedures (e.g., coronary angioplasty: Rybarczyk, Auerbach, Jorn, Lofland, & Perlman, 1993; dental procedures: Litt, Nye, & Shafer, 1993). Recently, the processes involved in coping with internal demands such as a disease (e.g., rheumatoid arthritis, fibromyalgia) and its associated symptoms (e.g., pain: Jordan, Lumley, & Leisen, 1998; Katz, 1998; Keefe et al., 1997) have also been investigated.

Another internal demand is intrusive or negative thoughts. This type of internal demand has been found to be associated with anxiety, depression, and chronic psychological disorders like obsessive-compulsiveness (e.g., Amir, Cashman, & Foa, 1997; Kent, 1987; Wenzlaff, Wegner, & Roper, 1988). For example, depressed individuals have a high accessibility to depressive thoughts (Wenzlaff et al., 1988) and spider phobics have higher levels of spider-related thoughts than non-phobics (Muris et al., 1997). In the health domain, Aydin (1997) found that negative thoughts were positively correlated with physical illness (e.g., coughs, dizziness, headaches). Also, Gil and colleagues found that the negative thoughts of adults with sickle cell disease predicted increased pain levels as well as psychosocial and functional adjustment (Gil et al., 1989; Gil et al., 1992; Gil et al., 1995).

Taken together, these results suggest that internal demands (i.e., negative thoughts) may be associated with negative psychological and behavioral outcomes. This raises the question of whether being able to cope with one's negative thoughts would produce psychological and

behavioral benefits. Social cognitive theory (Bandura, 1986) hypothesizes that it is pertinent for people to control their negative, demotivating thoughts because behavior is largely guided by what one thinks (Maddux, 1995). Although research on this topic in the exercise domain is scant, other research has shown the beneficial effects of coping with thoughts. For example, in a group of women studied by Ozer and Bandura (1990), it was found that as efficacy for controlling negative thoughts about sexual assault increased, their participation in behaviors outside of the home (e.g., walking, travel to another neighborhood, going to the movies) also increased while their anxiety arousal over the possibility of sexual assault decreased. Dua and Price (1993) found that a four-week intervention designed to teach healthy individuals different ways to cope with negative thoughts (i.e., negative thought reduction or positive thought replacement interventions) resulted in significantly lower postintervention thought-related distress compared to preintervention.

This research suggests that (a) some thoughts (e.g., intrusive, negative) act as internal demands that have the potential to affect motivated behavior and psychological well-being and that (b) coping with these thoughts produces both behavioral and psychological benefits. Thus, in the physical activity domain, consideration of the actual strategies used to cope with internal demands is warranted.

Coping Strategies and Categories

Coping is conceptualized as efforts to manage a demand (e.g., efforts to manage the pain of arthritis) and not as the actual outcome(s) produced by the coping (e.g., a reduction in pain; Lazarus & Folkman, 1984). This conceptualization suggests that any operational definition of coping must not be confounded with the coping outcomes that they are used to

explain. It also suggests that coping assessments should take into account all cognitive and behavioral attempts to cope, regardless of how well or poorly they worked (Lazarus & Folkman, 1984). In the coping literature, these coping attempts are most often referred to as coping strategies (e.g., Burckhardt, Clark, O'Reilly, & Bennett, 1997; Freeston, Ladouceur, Provencher, & Blais, 1995).

In health and sport domains, the measurement of coping strategies has been conducted in two general ways. One approach has been to employ previously developed coping instruments which contain specific coping strategies (e.g., Burckhardt et al.: Coping Strategy Questionnaire 1997; Crocker, 1992: Ways of Coping Checklist). Typically, such measures are used to determine which coping strategies are predictive of the outcome under investigation. In general, strategies included on these instruments are cognitive and behavioral in nature (e.g., diverting attention, emphasizing the positive, and increasing activity level). A second approach has been to employ open-ended assessments to identify cognitive and behavioral coping strategies. For example, Gould and colleagues used qualitative analysis of open-ended responses made by Olympic and National level athletes and detected 13 general dimensions employed to cope with stress (e.g., rational thinking, positive focus, time management, thought control: Gould, Finch et al., 1993; Gould, Eklund, & Jackson, 1993).

A recent review of coping strategies used in the sport domain (see Crocker, Kowalski, & Graham, 1998) suggested that open-ended measures should be employed when little is known about the phenomenon under investigation. These measures allow respondents to identify all salient coping strategies which may diverge from those contained in preexisting instruments because of the situational-specificity of the coping process (Lazarus & Folkman,

1984). Identifying salient strategies is important in order to determine their prevalence in specific situations. If certain strategies are reliably identified over time, then construction of an instrument is warranted. This suggests that in the exercise setting, open-ended measures should be used to assess how people cope with their acute, negative exercise thoughts due to the minimal knowledge that has been obtained about this phenomenon.

All specific behavioral and cognitive coping strategies fall into two major categories depending on their aim (Lazarus & Folkman, 1984). First, behavioral and cognitive coping efforts can be aimed at regulating emotional responses to the demand (i.e., emotion-focused coping). Second, behavioral and cognitive coping efforts can be aimed at managing or altering the demand (i.e., problem-focused coping). Such coping can be directed outward through efforts to change the environment and/or directed inward to the self through efforts to make cognitive and motivational changes. This latter coping effort suggests one possible way in which acute, positive exercise thoughts may operate in conjunction with acute, negative exercise thoughts. Specifically, positive thoughts may be an inward, problem-focused strategy aimed at buffering the impact that negative thoughts have on motivated behavior. This may help exercisers change their cognitive tone from negative to positive. Recent studies in psychology have examined this type of strategy. For example, Dua and Price (1993) found that an intervention designed to replace negative distress-producing thoughts with positive thoughts was effective in reducing distress.

Lazarus and Folkman (1984) also suggest that the use of problem- or emotion-focused coping depends on whether the external or internal demand is perceived as being within the control of the individual. Emotion-focused coping should proliferate when a lack of perceived

control exists and, thus, people attempt to control their reactions to the demand. For example, in attempts to cope with chronic diseases, people may be expected to use more emotion- than problem-focused coping due to the increased feelings of hopelessness that arise from the uncontrollable nature of such diseases (see Zautra & Manne, 1992).

In contrast, problem-focused coping should proliferate when the demand is perceived as being within the control of individuals. When this perception exists, people will try to manage or alter the problem. In the exercise setting, people should perceive some level of control over their thoughts. Even low levels of control would be unlike the uncontrollable thoughts that normally exist only as central manifestations of disorders such as obsessive-compulsiveness, generalized anxiety, and post-traumatic stress (Wells & Davies, 1994). Thus, healthy exercisers (i.e., who are adherent but vary in their weekly behavior) would be expected to employ problem- rather than emotion-focused coping when attempting to cope with acute, negative thoughts.

In summary, research in the health, sport, and general psychological domains has shown that people use a wide variety of coping strategies but the majority of these strategies are generally cognitive or behavioral in nature. As well, the evidence suggests that these cognitive and behavioral strategies are either problem-focused or emotion-focused. However, one shortcoming in this research is that little is known about which coping strategies are believed to be the most effective (Aldwin & Revenson, 1987; Keefe et al., 1997). This type of belief is termed coping response efficacy and contributes to whether people will exert and persist in their use of coping strategies (self-efficacy theory: Bandura, 1997).

Coping Response Efficacy

In general, coping response efficacy has been defined as an individual's "perception that the coping effort was successful in achieving the individual's goal in a particular situation" (Aldwin & Revenson, 1987, p. 339). The goal of a coping effort varies depending on the situation under investigation. For example, in arthritic samples, one goal of coping strategies that has been investigated was a reduction in pain (e.g., Keefe et al., 1997). It was found that as coping response efficacy increased, reported pain and negative mood decreased, whereas positive mood increased. Another goal of coping strategies that has been examined was to decrease the impact of various rheumatoid arthritis stressors (e.g., pain, fatigue, changes in physical appearance, symptom unpredictability: Katz, 1998). It was found that coping response efficacy for each stressor was negatively correlated with the perceived impact that each stressor had on participants' lives. These results provide preliminary evidence that beliefs in the effectiveness of coping strategies is important to assess. If we are to understand the beneficial effects of these beliefs on psychological and behavioral outcomes in the context of exercise, then the need for investigation is obvious.

Self-efficacy theory (Bandura, 1997) also highlights the benefits of believing in the efficacy of a given course of cognitive or behavioral action. This theory suggests that if individuals have high levels of coping response efficacy, they are more likely to exert coping efforts (i.e., coping strategies). Over time, as individuals gain mastery experiences in their use of certain strategies to cope with specific demands, their coping efforts should become more efficient. This efficiency results from their consistent selection of only effective coping strategies. Thus, asking adherent exercisers to identify coping strategies and related response

efficacy may provide some fruitful information.

Summary

To date, there has been minimal exercise research to determine whether people have ways of coping with acute, negative thoughts that are experienced when deciding whether to exercise. The primary objectives of this study were: (a) to identify strategies used by exercisers to cope with their acute, negative thoughts, (b) to determine the degree of confidence they have in the effectiveness of these strategies (i.e., coping response efficacy), and (c) to determine if coping response efficacy predicts postcoping exercise intention. It was hypothesized that individuals would report that they used cognitive and behavioral problem-focused coping strategies in keeping with the controllable nature of negative thoughts about exercise. It was also hypothesized that when employing cognitive strategies, exercisers would report that they used positive thoughts to counter the impact of their negative thoughts. As well, it was hypothesized that coping response efficacy would predict a perceived change in exercise intention following coping attempts.

A secondary study objective was to determine whether certain social cognitions and prior exercise behavior differed between two groups of exercisers. The first group was those exercisers who perceived a low impact of their thoughts on precoping exercise intention and the second group was those who perceived a high impact. Self-efficacy theory (Bandura, 1997) hypothesizes that individuals are not as perturbed by negative thoughts if they have prior mastery experiences. Mastery experiences may be obtained through experiencing acute, negative thoughts, coping with these thoughts, and, as a result, deciding to exercise. In the current study, it was hypothesized that individuals who reported a low impact on their

intentions would have significantly more prior exercise experience than those who indicated a high initial impact. It was also expected that the low impact group would have correspondingly fewer negative thoughts than the high impact group. Previous research has found that successful mastery experiences decrease the frequency with which people have negative thoughts (Ozer & Bandura, 1990).

Bandura (1986) also notes that people are not as perturbed by negative thoughts when they believe they can cope. One aspect of this belief is the perception that one can implement coping strategies that are effective (i.e., coping response efficacy). Thus, individuals who believe they can cope are better able to dismiss negative ruminations (see Ozer & Bandura, 1990). In the current study, it was expected that individuals who indicated a low initial impact of their negative thoughts would have a higher coping response efficacy than individuals who indicated a high initial impact of their negative thoughts. Furthermore, individuals in the low impact group would not perceive a large increase in their postcoping intention to exercise, whereas individuals in the high impact group would perceive that their intentions increased as a function of their ability to cope. The former individuals would not be expected to have a large increase in their postcoping intentions because they would not view their negative thoughts as influential.

Method

Participants

Participants were 100 healthy adults between the ages of 17 to 56 ($M_{age} = 26.43$ years; $SD = 8.88$ years). University students ($n = 57$) and professionals ($n = 26$) composed 83% of the sample, while managerial, technical, and clerical occupations characterized the remaining

17% of the sample ($n = 17$). At the time of data collection, all participants were actively participating in various community-based, structured fitness classes that were offered from one to seven days each week ($M_{\text{days}} = 3$; $SD = 1.41$). Similar to previous research using fitness class exercisers, the majority of the sample was female ($n = 86$).

In the four months prior to data collection, nine participants were inactive while 91 participants were actively engaged in an exercise program. These latter individuals exercised from one to seven days per week ($M_{\text{days}} = 4$; $SD = 1.22$). Each session lasted on average for 62 minutes ($SD = 20.72$ minutes) and typically involved the participants engaged in some combination of aerobic exercise and weights ($n = 66$), aerobic exercise on their own ($n = 14$), only fitness classes ($n = 7$), or only weight training ($n = 1$).

Measures

Negative exercise thoughts. This measure identified the most frequent acute negative thoughts that participants typically experienced when deciding whether to attend their planned fitness classes. In order to ensure that thoughts salient to participants were included on this measure, all of the thoughts were derived from those listed on the open-ended retrospective and prospective measures in the first study. Specifically, the 14 thoughts listed on the instrument included: physical (i.e., too tired, muscle soreness), other specific commitments (i.e., school work, job-related work, social engagement), time-related (i.e., no time, too busy), class-related (i.e., bad instructor; poor class time), motivational/affective (i.e., not motivated, don't feel like exercising, too lazy), inclimate weather, and having previously exercised.

Participants first read a definition of negative and positive thoughts. They were then instructed to place a check mark next to each negative thought, from the investigator-provided

list, that was typically experienced when deciding whether to exercise. They were also provided with a space to list additional negative thoughts that were not included on the investigator-provided list. Next, participants listed the three most frequent thoughts that they typically experienced. Questions about perceived impact on initial exercise intention, coping strategies, coping response efficacy, and perceived change in exercise intention postcoping were answered in relation to these three thoughts. A check on participants' agreement with the controlled definitions of thoughts (i.e., positive and negative) and the appropriateness for participants was conducted.²

Perceived impact on initial exercise intention. Participants indicated the impact that their three thoughts had on their intention to attend their fitness classes before any coping efforts were exerted. Impact was assessed on a 1 (not at all) to 9 (tremendously) scale. This measure was obtained in order to determine whether the participants perceived that their most frequent negative thoughts were in fact influential of their initial intention to exercise.

Coping strategy. In order to ensure that all participants used the same frame of reference when thinking about coping strategies, a definition was provided. Specifically, a coping strategy was defined as "any thinking or behavioral effort you frequently make in trying to manage the impact that negative thoughts have on your intention to attend your fitness classes". This definition was based on Lazarus and Folkman's (1984) description of coping

²Positive and negative thoughts were defined so that all participants had a common definition as a reference for their responses to subsequent questions (see Appendix C for definitions). As a check that each definition was easily understood and that it was the definition that participants felt they would normally use in responding to questions, they were asked at the end of the questionnaire if they disagreed with the definitions. If so, they were asked to write a better definition (see Appendix C). No participants disagreed with the definitions of positive and negative thoughts.

and it is similar to others used in previous coping research in the sport domain (e.g., Gould, Finch, et al., 1993). As well, the definition did not allude to, and was therefore not confounded with, the actual outcome (i.e., successful or unsuccessful) of the coping strategy. Immediately after the definition, an example of an attempt to cope with a negative thought was provided (see Appendix C). After reading the definition and example, participants were instructed to report the strategies they typically used to cope with each of their three negative thoughts. This task was completely open-ended. A check on the participants' agreement with the coping definition and its appropriateness was conducted.³

Coping response efficacy. For each coping strategy, participants indicated their confidence that the coping strategy was effective in helping to manage the impact of the specific negative thought. In keeping with Bandura's (1997) suggestions for the measurement of efficacy, it was assessed on a 0% (not at all confident) to 100% (completely confident) scale. A mean efficacy score for the three thoughts was calculated and used in subsequent analyses.

Perceived change in exercise intention postcoping. After indicating their coping response efficacy, participants indicated whether their intention to exercise changed when they coped with their thoughts. For those who indicated that intention did change, they then reported the perceived amount of this change from the time they first had negative thoughts (i.e., before coping) to the time following their attempts to cope with their thoughts. Perceived change following use of coping strategies was assessed on a 1 (no change) to 9 (enormous)

³Similar to the check on the controlled of definition positive and negative thoughts, participants indicated at the end of the questionnaire if they disagreed with the coping definition and, if so, they were asked to define a coping strategy (see Appendix C). No participants disagreed with the coping definition.

change) scale.

Procedure

Questionnaire administration. Each questionnaire contained a background information section, followed by the list of negative thoughts, perceived impact on initial exercise intention, coping strategies and related response efficacy, perceived change in exercise intention postcoping, and definition checks of negative and positive thoughts and coping strategies (see Appendix C for the questionnaire). The questionnaires were administered at the end of a designated fitness class. Questionnaires were completed and returned at this time. A number of participants ($n = 21$) returned the questionnaire within three days of administration in a drop box located in the fitness club. Responses on these questionnaires did not differ in comparison with the remainder of the sample. It is important to note that because the study focused on coping with negative thoughts, all participants had at least one month of exercise experience. This ensured that participants had some basis for their social cognitions and coping attempts.

Coding of coping strategies. In order to determine if any consistent types of coping strategies were reported by respondents, all of the strategies were coded into categories. The categories were based on the coping process proposed by Lazarus and Folkman (1984) and previous coping research which has consistently shown that various populations exert problem- or emotion-focused cognitive and/or behavioral coping efforts (e.g., arthritic: see Zautra & Manne, 1992 for a review; healthy populations: Aldwin & Revenson, 1987; athletes: Crocker, 1992).

In the current study, coping strategies were classified into one of eight coping categories: (a) problem-focused cognitive, (b) problem-focused behavioral, (c) problem-

focused combination (i.e., cognitive and behavioral strategies), (d) emotion-focused cognitive, (e) emotion-focused behavioral, (f) emotion-focused combination (i.e., cognitive and behavioral strategies), (g) no coping, or (h) unclassified. Problem-focused coping was operationalized as “coping directed at managing or altering the demand” and emotion-focused coping as “coping directed at regulating emotional responses to the demand” (see Lazarus & Folkman, 1984). Cognitive strategies were operationalized as “anything a person thinks” and behavioral strategies as “any action a person actually performs” in attempts to cope with the demand. Combination strategies were operationalized as the reported use of both cognitive and behavioral coping strategies. No coping was operationalized as a “no strategy used” response.

Using these definitions as a guide, three researchers who were knowledgeable about the coping literature but blind to study hypotheses independently coded all of the coping strategies. Strategies that did not discretely fit into the problem, emotion, or no coping categories or strategies that the researchers did not converge on in their classification were coded as unclassifiable. Descriptive statistics and coder agreement are presented in the results section.

Results

Descriptive Statistics

Negative exercise thoughts. An examination of the responses to the 14 thoughts indicated that being too tired, not having the time, and being too busy to exercise were the most frequently cited (see Table 4). About half of the sample had thoughts about not feeling like exercising and having school work to complete when deciding whether to exercise (see Table 4). Participants reported 25 additional negative thoughts on the open-ended section of this question (e.g., too hungry, not getting results, lack of social support). However, these thoughts

were not frequently cited (see Table 4).

When asked to indicate the three most frequent thoughts experienced when deciding whether to exercise, the majority of participants identified thoughts about being too tired, not having the time, and having school work to complete (see Table 4). The frequency with which the other thoughts were experienced is also reported in Table 4.

Table 4

Type and Frequency of Acute Negative Thoughts

Negative thought	Frequency as one of the three	
	Overall frequency (n)*	most common (n)*
Too tired	79	65
No time	68	47
Too busy	55	30
Don't feel like it	46	23
School work	45	35
Bad class time	30	12
Work-related	26	22
Not motivated	22	10
Social engagement	21	8
Muscle soreness	21	10
Bad weather	18	7
Too lazy	17	7
Already exercised	14	3
Bad instructor	11	1
Other	< 4	< 4

Note. The overall frequency represents the number of respondents who reported each thought.

The frequency as one of the three most common represents the total number of respondents who reported each thought as one of their most frequent.

*N = 100.

Perceived impact on initial exercise intention. Participants' three most frequent thoughts had a moderate perceived impact on their intention to attend their fitness classes before any coping efforts were exerted ($M = 5.50$; $SD = 2.01$).

Coping strategies. Five categories captured all of the strategies that participants used to cope with their three most frequent thoughts: (a) problem-focused cognitive (b) problem-focused behavioral (c) problem-focused combination (i.e., cognitive and behavioral) (d) no coping, and (e) unclassifiable. Most participants reported problem-focused cognitive, then problem-focused behavioral and problem-focused combination categories (see Table 5). A very small number of participants had no coping strategy whatsoever for some thoughts (see Table 5).⁴

A similar trend in frequencies was observed when the strategies reported within each category were summed across all participants. Specifically, participants most often cited strategies captured by the problem-focused cognitive category, followed by the problem-focused behavioral and the problem-focused combination categories (see Table 5). The unclassifiable category contained four strategies that could not be coded into any of the general coping categories and 22 strategies that the coders could not agree upon. Since the total number of reported strategies was 280, inter-coder agreement was acceptable at 92%.

Appendix E contains the specific strategies that were coded as either cognitive, behavioral, or combination coping categories. The number of participants who reported use of

⁴Coping categories that individuals typically used to deal with specific groupings of negative thoughts (i.e., time-related: no time and too busy; specific commitments: school, work, and social; motivational/affective: don't feel like it, not motivated, and too lazy; physical: too tired and muscle soreness; class-related: bad class time and bad instructor; ungrouped: bad weather, already exercised, and other thoughts) are contained in Appendix D.

Table 5

Coping Categories: Use, Frequency, and Response Efficacy

Coping category	Participants reporting use of each category (n)*	Total number of strategies coded within each category (n)**	Coping response efficacy (M)*
Problem-focused	75	136	69.73
cognitive		(49%)	(16.81)
Problem-focused	46	69	62.36
behavioral		(25%)	(19.40)
Problem- focused	23	32	67.68
combination		(11%)	(17.19)
Unclassifiable	20	26	67.00
		(9%)	(20.55)
No coping	14	17	
		(6%)	

Note. Percentages of the total number of all strategies are reported in parentheses. Standard deviations for coping response efficacy are reported in parentheses. Coping response efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale. A single participant could have reported use of up to three coping categories.

*N = 100.

**N = 280.

each strategy is also contained in this appendix. As seen, the majority of problem-focused cognitive strategies involved participants thinking about various outcome expectancies arising from exercise participation (e.g., controlling weight, feeling better, stress relief, and increased energy). The majority of the problem-focused behavioral strategies involved participants employing various time management skills (i.e., prioritizing and scheduling exercise, doing work at other times). Less frequent behavioral strategies involved meeting up with an exercise partner, arranging transportation, and doing other activities when the regular exercise session was missed (see Appendix E). The majority of the problem-focused combination strategies involved time management behavioral strategies and cognitive strategies that involved thinking about positive outcomes of exercising (see Appendix E).

Coping response efficacy. Participants were fairly confident that their strategies worked to manage the impact of their three most frequent negative thoughts ($M = 63.83\%$; $SD = 18.07\%$). Similarly, for each coping category, participants were fairly confident (see Table 5).

Perceived change in exercise intention postcoping. Ninety-two participants indicated that they perceived a change in their intention to attend their fitness classes postcoping. The reported mean strength of this perceived change was 6.33 ($SD = 1.47$) on a nine-point scale.

Relationship Between Coping Response Efficacy and Change in Intention

In order to examine the association between coping response efficacy and perceived change in intention postcoping, a correlational analysis was conducted. Only those participants (i.e., $n = 92$) who indicated that their intention to exercise changed postcoping (see question D

in Appendix C)⁵ were included in this analysis. This was done because the subsequent perceived change scale (see question E in Appendix C) queried respondents about the amount of change and the research interest was in the correlates of this change. For these individuals, change could only be in a positive direction. The correlational analysis revealed a significant, positive association ($r = .33$; $p < .01$) such that as coping response efficacy increased, perceived change in exercise intention postcoping also increased. Not surprisingly, the hypothesis that coping response efficacy was predictive of a perceived change in exercise intention postcoping was supported. Specifically, a regression analysis revealed that coping response efficacy was a significant predictor of perceived change in intention (R^2 adjusted = .10, $p < .001$; $n = 90$).

Perceptions of Negative Thought Impact: Individual Differences

Prior exercise history and negative thoughts. Participants who perceived that their three most frequent thoughts exerted a very high or a very low impact on their initial exercise intention were identified through a tertile split. The rationale for this analysis was that it would identify individuals who would be most likely to exhibit individual differences in the determinants of intention should they exist (self-efficacy theory: Bandura, 1997; Ozer & Bandura, 1990). The tertile split produced two extreme groups: (a) a low initial impact group whose individuals had a score of 4 or less on the 9-point scale for the thought impact ($n = 28$) and (b) a high initial impact group whose individuals had a score of 7 or greater ($n = 33$).⁶ It is

⁵For this group, descriptive statistics indicated that their thoughts exerted a moderate impact on their initial exercise intention ($M = 5.55$; $SD = 1.91$). They also indicated a fairly high coping response efficacy ($M = 63.81$; $SD = 15.89$). These findings were similar to the overall group.

⁶See Appendix F for the sample distribution of the tertile split.

and (b) a high initial impact group whose individuals had a score of 7 or greater ($n = 33$).⁶ It is argued that those participants who reported a moderate impact score of 5 or 6 were not likely to exhibit a consistent pattern of differences and were therefore excluded ($n = 28$). It is important to note that previously inactive participants were excluded from this analysis ($n = 9$) because they did not have a prior exercise history that would have developed the relevant determinants being tested.

A t -test indicated that the two extreme groups significantly differed on the perceived impact of their negative thoughts on initial intention, $t(59) = -19.27$, $p < .0001$. Thus, a comparison between truly different groups could proceed. A one-way between groups MANOVA analysis was subsequently conducted comparing high and low initial impact groups on the dependent variables of previous four month exercise history (i.e., number of days per week; length of time of each exercise session: see question 6i and 6ii in Appendix C) and the number of negative thoughts experienced in decisions to exercise. Assumptions underlying the use of the MANOVA were met (i.e., nonsignificant Levene's and Box's tests: $ps > .05$). The overall MANOVA was significant, $F(3, 57) = 4.23$, Pillai's Trace = .18, $p < .009$.

Subsequent univariate F -tests revealed that the low initial impact group exercised on significantly more days each week in the prior four months, $F(1, 59) = 8.55$, $p < .005$ (power = .82; $\eta^2 = .13$) and experienced significantly less negative thoughts $F(1, 59) = 4.28$, $p < .04$ (power = .53; $\eta^2 = .07$) than the high initial impact group (see Table 6 for means). The total amount of time spent exercising during each session in the prior four months did not significantly differ between the groups $F(1, 59) = 1.00$, $p > .10$ (power = .17; $\eta^2 = .02$: see

⁶See Appendix F for the sample distribution of the tertile split.

Table 3 for means). Taken together, the significant results offer support for the hypotheses that individuals low or high in their perception of initial impact would exhibit differences in their prior exercise history and in their negative thought frequency.

Table 6

Comparing Initial Impact Groups: Exercise History and Acute Negative Thoughts

Variable	Low impact on initial	High impact on initial
	intention	intention
	(M)	(M)
Days per week of prior exercise	4.25*	3.42*
	(1.17)	(1.03)
Length of prior exercise sessions	58.57	63.79
	(16.82)	(22.85)
Negative thoughts experienced	4.53*	5.70*
	(1.95)	(2.36)

Note. Standard deviations are reported in parentheses. Length of prior exercise is reported in minutes. Only previously active participants were included in the groups.

* Row means significantly differed at $p < .05$.

Coping response efficacy and perceived change in intention postcoping. In order to determine if coping response efficacy and perceived change in intention postcoping differed between low and high perceived impact on initial intention groups, another MANOVA was conducted. Another tertile split procedure was conducted to identify extreme groups because all participants were included in this analysis. The rationale for detecting individual differences was the same. The research question focused on whether initial impact groups would differ in their intention after coping with negative thoughts and in their coping response efficacy.

The tertile split of all participants resulted in a low impact group of 30 participants and a high initial impact group of 36 participants. A t -test indicated that these two extreme groups significantly differed on the perceived impact of their negative thoughts on their initial intention, $t(58) = -19.83, p < .0001$. Thus, comparisons between two truly different groups could proceed.

A one-way between groups MANOVA was then conducted comparing high and low initial impact groups on the dependent variables of coping response efficacy and perceived change in intention postcoping. In the testing the assumptions for the MANOVA, a significant Levene's test ($F = 10.32, p < .01$) indicated that the variances of coping response efficacy for the groups were unequal. The data were negatively skewed. In such instances of non-normal distributions, Tabachnik and Fidell (1996) recommend data transformation. Following the transformation (i.e., reflected and logged), subsequent Levene's and Box's tests were nonsignificant ($ps > .01$) which revealed that assumptions underlying the use of MANOVA were not violated and a MANOVA could proceed.

The overall MANOVA was not significant, $F(2, 59) = .87$, Pillai's Trace = .03, $p > .10$. Although the dependent variables did not significantly differ between groups, the direction of the means was as hypothesized. The low impact group had higher coping response efficacy and lower change in intention than the high initial impact group (see Table 7 for means).

Table 7

Comparing Initial Impact Groups: Response Efficacy and Intention

Variable	Low impact on initial	High impact on initial
	intention (M)	intention (M)
Coping response efficacy	70.71 (11.23)	63.24 (16.63)
Perceived change in intention postcoping	6.23 (2.03)	6.41 (1.46)

Note. Standard deviations are reported in parentheses. Coping response efficacy means used in the analysis were reflected and logged ($M_{\text{low impact}} = 1.44$, $SD_{\text{low impact}} = .21$; $M_{\text{high impact}} = 1.52$, $SD_{\text{high impact}} = .26$). For ease of interpretation, coping response efficacy raw means are reported in the table. Coping response efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale.

Summary

When deciding whether to exercise, the acute negative thoughts that participants most frequently experienced were being too tired, having no time, being too busy, and having work to complete. Prior to coping, the group mean for the impact of the three most frequent negative thoughts was moderate. In attempts to cope with negative thoughts, the most commonly reported strategies were problem-focused cognitive. Participants coped by thinking about the positive outcomes they obtained from exercising. The next most commonly reported strategies were problem-focused behavioral strategies (e.g., cope by managing time or meeting a friend to exercise with) and finally some combination of these cognitive and behavioral strategies (e.g., cope by managing time and thinking about one's weight loss goal).

The group mean for participants indicated that they were reasonably confident that their coping strategies worked in order to manage the impact of their frequent negative thoughts (i.e., coping response efficacy). As well, coping response efficacy was found to be predictive of this change in intention. The effect size for this latter finding was small (Cohen, 1992; Green, 1991).

Finally, the first one-way between-group multivariate analysis revealed that those participants who perceived a low impact of their thoughts on initial exercise intention had (a) exercised on significantly more days in the prior four months and (b) had significantly less negative thoughts than those participants who perceived a high initial impact.

Discussion

The impetus for the second study was the finding that exercisers who were classified as negative thinkers managed to attain a reasonably high adherence rate (i.e., 73%: Study One).

This suggested that while adherers struggled with negative thoughts, they somehow managed to exercise regularly. Questions that naturally evolve from this possibility are do negative thoughts influence intention to exercise prior to coping, and, do adherers cope effectively with negative thoughts? Thus, the specific questions investigated in the current study were whether: (a) acute, negative thoughts were perceived to impact people's intention to exercise before any coping attempts were exerted, (b) exercisers employed coping strategies to manage the impact of their negative thoughts, and (c) coping response efficacy for these strategies predicted a perceived change in exercise intention postcoping.

Influence of Negative Thoughts on Initial Exercise Intention

Participants most frequently reported having negative thoughts about having school work to complete, being too tired, not having the time, and being too busy. The frequent reporting of the first thought was not surprising because the majority of the sample were university students. The latter three thoughts have been frequently reported in previous literature (i.e., perceived barriers: see Brawley et al., 1998 for a review). Interestingly, very few participants reported negative thoughts on the open-ended part of the measure. This suggests that the investigator-provided list, which was derived from Study One, captured many of the thoughts that were frequently experienced by this group of fitness class exercisers.

It was also observed that participants' frequent, negative thoughts were perceived to exert a moderate impact on their initial exercise intention (i.e., 5.5 on a 9-point scale). Consideration of their exercise history may explain this finding. Despite experiencing negative thoughts when deciding about exercise, all participants had been adherent for at least one month. According to self-efficacy and social cognitive theories (Bandura, 1986; 1997), the

first month of mastery experiences may not only have increased their efficacy to adhere, it may also have increased their efficacy to cope with negative thoughts. Thus, adherers were minimally concerned with the impact of their negative thoughts.

The importance of mastery experiences in decreasing the perturbation of negative thoughts, as hypothesized by social cognitive and self-efficacy theories (Bandura, 1986; 1997), was further observed among those individuals who perceived a low initial impact of their acute negative thoughts. This group was found to have exercised on significantly more days each week in the previous four months and to have reported significantly less negative thoughts than a counterpart group who perceived a high initial impact. Recall that each member of these two groups had been adhering to an exercise program during the previous four months. This finding of less negative thinking among exercisers who had greater adherence mastery is not unlike the results of Ozer and Bandura (1990). They demonstrated that a group of women decreased their frequency of negative thoughts regarding sexual assault as a function of a mastery-based intervention which focused upon dealing with the assault.

Coping Response Efficacy and Perceived Change in Exercise Intention Postcoping

The current study yielded two basic findings about the relationship between coping and the resultant change in exercise intention postcoping. First, after exerting coping efforts, participants perceived an above average increase in their exercise intention. Second, coping response efficacy accounted for a significant, albeit modest, amount of the variance in this intention construct.

These two findings suggest that coping response efficacy may be important even among exercise adherers. The importance of this type of efficacy in the exercise setting parallels

findings from other domains. For example, in arthritic populations, as response efficacy for coping with various rheumatoid arthritis stressors (e.g., pain, fatigue) increased, the perceived impact that these stressors had on the participants' lives decreased (Katz, 1998). From a theoretical perspective, recall that self-efficacy theory (Bandura, 1997) hypothesizes that when individuals have high levels of coping response efficacy, they are more likely to exert coping efforts. This then should produce an increase in intention. This would seem to be the case for adherers in the present study.

An above average level of the efficacy of participants' coping strategies for their three most frequent thoughts was observed in the current study (i.e., 64%). Participants' response efficacy for each of the three problem-focused coping categories was equally high (i.e., all greater than 63%). These efficacy levels were not surprising considering the nature of the sample and their prior mastery experiences (i.e., minimum of one month adherence) in dealing with their negative thoughts. One implication for intervention might be to provide exercisers with both cognitive and behavioral strategies to deal with their acute, negative, exercise-related thoughts. Such an intervention may increase intention to adhere. However, more research is needed to determine the reliability of the current findings and whether such an implication has merit.

Interestingly, coping response efficacy and perceived change in intention postcoping did not differ for individuals who perceived a low initial impact of their thoughts on intention and those who perceived a high initial impact. One reason for the lack of significant differences may have been due to the small sample sizes employed in the MANOVA analysis. Having such a low number of people in each group may have increased the chances of

committing a type II error (Cohen, 1992). Additional research with larger samples may provide a more accurate test of the hypothesized differences.

Coping Strategies

Coping strategies for the participants' three most frequent thoughts were classified into one of five general coping categories: (a) problem-focused cognitive, (b) problem-focused behavioral, (c) problem-focused combination (i.e., cognitive and behavioral), (d) no coping, and (e) unclassifiable. Classification of strategies to the problem-focused categories was consistent with the observations in the general coping literature. Specifically, problem-focused coping predominates when a perceived level of control exceeds the demand (Lazarus & Folkman, 1984). In the present exercise setting, a demand was assumed to be negative thoughts. Exercisers may have perceived some level of control over their negative thoughts because they provided examples of coping efforts aimed at managing the impact of their thoughts (i.e., problem-focused coping; Lazarus & Folkman, 1984).

Recall that problem-focused coping can occur in two ways. First, people may put forth behavioral efforts to manage the demand. In the current study, participants most often reported use of time management behaviors (e.g., schedule exercise into a day planner; do work ahead of time, reschedule social engagement). Second, people may put forth cognitive efforts to manage the demand. In the current study, participants reported a variety of cognitive coping strategies (e.g., think about the weight lost as a result of exercise, think about how much better exercise makes one feel). In general, these strategies involved thinking about the positive outcomes that were expected from exercising (i.e., positive outcome expectancies: see Bandura, 1997). These thoughts about positive outcome expectancies were similar to the

positive thoughts reported in Study One. As hypothesized, participants reported use of positive thoughts when asked how they dealt with the impact of their negative thoughts.

Use of this type of coping strategy has been examined in a controlled intervention which was designed to replace negative distress-producing thoughts with positive thoughts. The intervention was effective in reducing distress in a general population (Dua & Price, 1993). The effectiveness of such interventions and participants' everyday use of positive outcomes as a coping strategy underscores the importance that Bandura (1997) places upon the incentive necessary for efficacy to influence behavior. The results suggest that outcome expectancies may function in concert with efficacy to help to motivate exercisers to change their behavioral intentions. Without the incentive from actively dwelling on positive outcomes of exercising, confidence in the effectiveness of coping alone (i.e., reduce impact of negative thoughts) may not offset negative thoughts and promote change in intention and subsequent exercise.

Strengths and Limitations

Findings from the current study have clarified the relationships between coping strategies employed by exercisers and the social cognitive variables that promote their efforts to deal with their acute, negative thoughts. Recall that Kendzierski and Johnson's (1993) study and Study One showed that exercisers experienced acute, negative thoughts when deciding whether to engage in planned exercise. The current study extends this research by providing initial descriptions of the actual strategies used to cope with acute, negative exercise thoughts. A methodological strength is that the identification of salient coping strategies was encouraged because participants were used as active agents in offering their own strategy descriptions

versus responding to a list of assumed strategies provided by the investigator (Sherif & Sherif, 1969). Another strength is that the study provided initial evidence that coping response efficacy may be an important social cognitive variable in exercise decision making. A final strength is that this study is the first in the exercise setting to show that the impact of acute, negative thoughts on exercise intention is affected by prior mastery experiences (i.e., adherence).

Despite these strengths, consideration of study limitations places the findings into perspective. One limitation is that the sample consisted of mainly female volunteers who were actively engaged in structured fitness class programs. Generalizing the findings from this study to other exercise populations may be premature. At the same time, it is important to note that a great deal of research on exercise adherence has utilized similar samples. A second limitation is the relatively low statistical power associated with the multivariate analyses. Despite this limitation, one significant omnibus effect was observed and follow-up tests revealed predicted differences. Future research should employ larger sample sizes in order to provide sufficient power to detect at least a medium-sized effect.

Future Directions

A logical question that arises from this research is whether the observed relationships are reliable. Thus, future research should obtain repeated measures of the variables examined in this study. This would provide insight about the dynamic and possibly changing nature of the observed relationships. Such a longitudinal study would be in contrast to the current study which only provided a snapshot view of the relationships under investigation.

A second future direction is to continue examining the process that exercisers engage in

when they attempt to cope with their acute, negative thoughts. Results from Study Two provided initial evidence that exercisers perceived some benefit to coping with their acute, negative thoughts. Coping response efficacy predicted an increase in exercise intention for a group of adherers. This finding was supportive of hypotheses advanced by self-efficacy theory (Bandura, 1997). This theory also suggests that another belief, coping self-efficacy, may play an important role in the execution of coping efforts. Specifically, individuals will only attempt to cope when they are confident in their abilities to execute coping strategies, regardless of how effective they believe these strategies to be (i.e., coping response efficacy). Thus, Study Three was undertaken to examine coping self-efficacy.

STUDY THREE

Manipulating Exercisers' Coping Self-Efficacy: Impacts on Decision-Making, Intention, Behavior, and Affect

Coping self-efficacy has not been examined in the exercise literature to date and a study is warranted. This examination should involve exercisers who may not have sufficient mastery experiences in coping with their acute, negative thoughts (i.e., beginner or inconsistent exercisers). These exercisers would be expected to have variable coping self-efficacy beliefs as compared to more experienced exercisers (self-efficacy theory: Bandura, 1997). They may experience a greater struggle in their attempts to cope with their acute, negative thoughts and, as a result, they may experience difficulties in deciding whether to exercise as initially planned. An investigation focussing upon these exercisers may help to answer the following research questions. First, does coping self-efficacy exert an impact on (a) the extent to which beginner or inconsistent exercisers struggle with their decisions to exercise prior to coping (i.e., struggle) and (b) the ease/difficulty of making a decision of whether to exercise after coping efforts are exerted (i.e., exercise decision)? Second, does coping self-efficacy influence these exercisers' intention to exercise? Third, does coping self-efficacy directly influence other psychological and behavioral factors (i.e., affect and behavior) as hypothesized by self-efficacy theory (Bandura, 1997)? Fourth, is the strength of coping self-efficacy a function of the same types of determinants proposed for behavioral efficacy? If the manipulation of these determinants can alter coping self-efficacy, then it is also conceivable that there should be a related influence on intention, behavior, and affect (self-efficacy theory: Bandura, 1997).

Thus, one purpose of the current study was to determine if exercisers' confidence in

their abilities to cope (i.e., coping self-efficacy) with their acute, negative thoughts predicted their (a) struggles with deciding to exercise prior to coping, (b) ease/difficulty of deciding whether to exercise postcoping, (c) exercise intention, (d) behavior, and (e) affect. A second purpose was to determine if a verbal persuasion message (i.e., a determinant of efficacy) that focused on the ease or difficulty of learning and implementing coping strategies could alter exercisers' coping self-efficacy and, as a consequence, influence the aforementioned variables in the first purpose. A rationale for these purposes follows.

Influence of Coping Self-Efficacy

Influence of coping self-efficacy on intention, struggle, and exercise decision. Self-efficacy theory (Bandura, 1997) hypothesizes that efficacy beliefs directly influence behavioral intention. Generally, the more efficacious that people are in their abilities to exert effortful and persistent actions in order to achieve desired outcomes, the more they will intend to carry out these actions. In the exercise setting, this relationship has been supported across a wide range of populations (e.g., experienced and beginner exercisers; adolescents and adults: see McAuley & Mihalko, 1998 for a review). For example, Fruin, Pratt, and Owen (1991) found that healthy adolescents who had a high exercise efficacy (i.e., confidence in abilities to engage in physical activity) also indicated a higher intention to exercise than adolescents with a low exercise efficacy. Poag-DuCharme and Brawley (1993) examined two types of self-efficacy: (a) barrier self-efficacy (i.e., confidence in abilities to overcome obstacles to exercise) and (b) scheduling self-efficacy (i.e., confidence in abilities to schedule regular exercise). Both forms of efficacy were found to predict intention to exercise at a fitness club for a group of beginners. These and other studies contribute to the evidence that indicates efficacy in abilities to perform specific

actions related to exercise (e.g., performing the exercise actions; schedule well) influences exercise intention.

While behavioral efficacy beliefs predict intention, would individuals' efficacy beliefs about their abilities to cope with acute, negative thoughts predict their exercise intention? Further, does coping self-efficacy influence other variables that may contribute to whether exercise is performed? Consideration of when individuals experience acute thoughts and exert coping efforts in relation to their exercise behavior may provide clues to the answers of these questions. Recall that negative thoughts are typically experienced when people are deciding whether to exercise as initially intended. Thus, acute thoughts may interfere with at least two facets of the decision-making process: (a) the struggle, or the cognitive rumination and effort, associated with considering whether to exercise prior to exerting coping efforts (i.e., called struggle) and (b) the overall ease/difficulty of making a decision of whether to exercise after exerting coping efforts (i.e., called exercise decision).

When individuals make decisions, they consciously consider the benefits (e.g., acute, positive thoughts) and the costs (e.g., acute, negative thoughts) of exercising (cf. Maddux et al., 1995). This suggests that when individuals first consider whether to exercise and perceive many costs (e.g., have numerous acute, negative thoughts), they may struggle and exert a great deal of cognitive effort about their decision to exercise. In contrast, when individuals perceive many benefits (e.g., have numerous acute, positive thoughts), this struggle may be diminished or may not occur. However appealing these notions may be, they have not been examined to date in the exercise literature.

In addition to the overall tone of acute thoughts, coping self-efficacy may also influence

the initial struggle that individuals experience. Specifically, individuals who are efficacious in their abilities to cope with their acute, negative thoughts are not as initially perturbed by these thoughts (self-efficacy theory: Bandura, 1997). Thus, even before exerting coping efforts, they do not struggle, or ruminate, as much about whether to exercise compared to less efficacious individuals. Further, once efforts are mobilized to cope with acute, negative thoughts, efficacious individuals should experience a relative ease in reaching a decision of whether to exercise. This is because efficacious individuals exert greater and more persistent coping efforts compared to less efficacious individuals (self-efficacy theory: Bandura, 1997). Such efforts increase the likelihood of successful coping which should increase the ease of deciding whether to exercise in the face of acute thoughts. In much the same fashion, the impact of acute, negative thoughts on exercise intention (i.e., the behavioral goal/plan) should also be reduced or negated.

In short, efficacious individuals should struggle less with their decisions to exercise prior to exerting any coping efforts. After mobilizing coping resources and making persistent coping efforts, they should perceive an ease of reaching an exercise decision (i.e., since they are efficacious in their coping abilities). They should also have a high intention to exercise. In contrast, less efficacious individuals should struggle more with their decisions to exercise prior to coping. With fewer coping resources, they should also perceive a greater difficulty in reaching an exercise decision. They should also have less intention to exercise.

Influence of coping self-efficacy on behavior. The next logical question is whether or not coping self-efficacy is related to behavior. Recall that coping self-efficacy reflects exercisers' confidence in their abilities to cope with acute, negative thoughts that arise when

they are deciding whether to exercise as planned. Clearly, coping self-efficacy is not identical to confidence in abilities to perform self-regulatory, exercise-related behaviors (e.g., scheduling). Thus, coping self-efficacy is a step removed from these behavioral beliefs. As outlined, it is expected that coping self-efficacy should be related to facets of the decision-making process (i.e., struggle with the decision and final decision) and intention to exercise. By contrast, coping self-efficacy should be less related to the actual exercise behavior. Scheduling or exercise self-efficacy are the more correspondent, behavioral forms of efficacies that facilitate performance of the exercise once the decision to exercise has been made and an intention to exercise has been formulated. Thus, these more correspondent behavioral beliefs should be more related to exercise behavior than coping self-efficacy.

Clearly, attention to the correspondence or specificity between specific forms of efficacy and specific forms of behaviors is warranted. With this specificity in mind, it may be important to examine whether coping self-efficacy predicts behavioral outcomes that are important for eventual exercise behavior. Recall that preliminary evidence indicates that coping with acute, negative thoughts when deciding whether to exercise may impact upon intention to exercise (i.e., Study Two: coping response efficacy). However, if individuals do not have the knowledge of how to cope with their thoughts, then they may not exert any coping efforts (self-efficacy theory: Bandura, 1997) and struggle with their decisions to exercise. The implication for intervention for such individuals is that they may benefit from engaging in coping-related behaviors such as learning about how to cope with negative thoughts. Specifically, such efforts may bolster coping self-efficacy. With mastery experiences over time, coping self-efficacy should contribute to one's decision and intention to exercise.

Exercise adherence should be eventually enhanced.

Influence of coping self-efficacy on affect. Self-efficacy beliefs are also hypothesized to influence affect (social cognitive and self-efficacy theories: Bandura, 1986; 1997). Individuals who lack confidence in their abilities to cope with a demand dwell on their coping deficiencies and distress themselves over the impending negative impact of the demand (Bandura, 1997). In contrast, efficacious individuals focus their efforts on adopting strategies and effective courses of action in order to overcome the demand. For these latter individuals, worry and distress over the demand is diminished. Preliminary evidence in the general psychological domain supports this relationship between efficacy and affect. For example, Ozer and Bandura (1990) investigated the relationship between women's efficacy in their abilities to control negative thoughts about sexual assault and one specific type of affect (i.e., anxiety). They found that as the women's efficacy increased, their anxiety arousal over the possibility of sexual assault decreased.

In the exercise setting, affect has been typically investigated in two ways. First, the effect of acute, exercise bouts on immediate affective states has been investigated. In general, these studies have found that acute bouts of exercise induce a range of affective outcomes such as decreased anxiety, depression, and increased feelings of energy and tranquillity (see Gauvin & Spence, 1998 for a review). Second, the effect of cognitive attributions on affective states has been investigated. This latter perspective holds that affective states arise from attributions about success or failure in a given domain (Weiner, 1986).

In research examining coping with acute, negative thoughts, this latter form of attribution-dependent affect would seem to be the most pertinent. This is because exercisers'

efforts to cope with their negative thoughts typically result in one of two outcomes – success (i.e., cope with thoughts) or failure (i.e., do not cope with thoughts). Regardless, if the outcome is relevant to the person, then either a general positive or a general negative emotion is the result (cf. Weiner, 1986). Furthermore, if people attribute causes for the outcome, distinct affective states are produced. For example, attributing the reason for a success in coping with one's negative thoughts to effort may produce feelings of pride. In contrast, attributing the reason for a failure to cope with one's negative thoughts to a lack of ability may produce feelings of incompetence. Thus, asking exercisers how they feel after exerting efforts to cope with their negative thoughts may provide some preliminary information on whether affective states are influenced by such efforts. It would be expected that exercisers who are confident in their coping abilities would have a greater likelihood of experiencing a successful coping outcome (self-efficacy theory: Bandura, 1997) and, thus, more positive affect.

Summary. Coping self-efficacy is hypothesized to predict exercisers' decision struggle prior to exerting coping efforts and the overall ease/difficulty of deciding whether to exercise postcoping. Coping self-efficacy is also hypothesized to predict exercise intention, coping-related behavior, and affect (self-efficacy theory: Bandura, 1997). Evidence for these latter three relationships would provide support for the predictive validity of the coping self-efficacy construct in the exercise domain. Predictive validity could also be gained through the manipulation of coping self-efficacy and an assessment of the resultant impact on these outcomes. In an attempt to manipulate coping self-efficacy in the current study, verbally persuasive communications were used. This type of persuasion is one hypothesized determinant of self-efficacy beliefs (Bandura, 1997).

Controlling for Moderators in the Manipulation of Coping Self-Efficacy

Both the self-efficacy and the social persuasion literature suggest that various individual differences can influence both the type of person who can be persuaded and the magnitude of the persuasion. Thus, controlling for individual differences through design, sample selection, and message construction becomes an important consideration. In the present study, particular attention was given to (a) the amount of recent exercise mastery experiences and (b) the overall tone or valence of acute exercise thoughts.

Self-efficacy theory (Bandura, 1997) hypothesizes that verbal persuasion may be particularly useful when efficacy beliefs are not well established (i.e., lack consistent mastery experiences) and, as a result, are more amenable to an immediate change. In the exercise domain, some beginner or inconsistently active exercisers may have such variable beliefs. These people may not have sufficient mastery experiences in coping with the acute, negative thoughts associated with their decisions to exercise. As a consequence, they may have difficulties in coping with these thoughts. Such difficulties may undermine their existing self-efficacy beliefs (self-efficacy theory: Bandura, 1997). Consequently, their intent, affect, and behavior may be negatively influenced (Bandura, 1997).

Thus, providing people who lack mastery experiences with a message that (a) contains information on how to cope with negative thoughts (i.e., coping strategies) and (b) persuades them of the easy use of these strategies may be advantageous for three reasons. First, if the message is successfully persuasive, an acute impact on coping self-efficacy should be observed (self-efficacy theory: Bandura, 1997). Second, as a consequence, individuals should be motivated to immediately exert a greater coping effort in order to combat their acute, negative

thoughts (Bandura, 1997). Third, if these coping efforts are successful, positive changes would be expected in intention and affect (Bandura, 1997) as well as in aspects of the decision-making process (i.e., struggle and decision).

Although these changes would be generally expected in beginner or inconsistent exercisers, another individual difference variable may influence the magnitude of persuasion. Specifically, the overall tone or valence of an exerciser's acute, exercise thoughts may influence the magnitude of persuasion. Recall from Study One that negative thinkers (i.e., those who experienced more negative than positive acute thoughts) had significantly lower attendance self-efficacy and exercise attendance than a counterpart group of positive thinkers. These differences suggest that negative thinkers may not have as effective coping strategies at their disposal as their positive counterparts. Thus, they would have a lower coping self-efficacy than positive thinkers. If this is the case, negative thinkers who are low in coping self-efficacy may have their efficacy beliefs more easily strengthened by a persuasive message than positive thinkers. That is, the former individuals would be expected to have a lower to moderate premanipulation coping self-efficacy and, as a result, have greater room for persuasive enhancement than the latter individuals (i.e., who have stronger coping self-efficacy beliefs). It is also important to note that because both types of thinkers would be exercising at the time of a manipulation attempt (i.e., they are motivated to perform some exercise at the time), it would be unlikely that any counter persuasion change would occur (i.e., boomerang effect) – as might be the case with dropouts or nonexercisers who could have low coping self-efficacy.

Impact of Persuasive Messages on Self-Efficacy

Regardless of potential moderators (e.g., prior exercise mastery; type of thinker), verbal persuasion in the form of a written message does appear to have some promise in influencing efficacy beliefs in an acute fashion. For example, in the general psychological domain, Maddux, Norton, and Stoltenberg (1986) presented three different written messages about an interpersonal assertiveness technique (i.e., broken-record technique) to three different groups of undergraduates. The messages were designed to manipulate (i.e., increase) self-efficacy for use of the technique, outcome expectancy of the technique, or outcome value of the technique. They found that the self-efficacy and the outcome expectancy manipulations were immediately successful. Furthermore, immediate, postmanipulation outcome expectancy and immediate, postmanipulation outcome value predicted intention to use the technique.

In the exercise domain, Rodgers and Brawley (1996) presented four written messages about weight training to four different groups of beginner weight trainers. The messages were designed to manipulate self-efficacy and outcome expectancies for weight training (i.e., a 2 X 2 design). It was found that those groups who received the high self-efficacy messages had an immediate higher intention to weight train than those groups who received the low self-efficacy messages.

Although these findings suggest that written messages are capable of immediately enhancing efficacy, their effectiveness depends on at least three characteristics. First, the message must be perceived by the reader as informational and credible (Bandura, 1997; Kopfman, Smith, Ah Yun, & Hodges, 1998). These attributes reduce peoples' resistance to the persuasive message because they perceive the message as being believable. Second, the

message must be understandable to the readers (Kopfman et al., 1998). Clearly, efforts to persuade individuals would be lost if the readers did not understand the message. Third, the message must be perceived by the readers as being designed for people like themselves (Bandura, 1997; Kopfman et al., 1998). This perception can be encouraged by the inclusion of similar characters in the message. For example, the Canadian Physical Activity Guide for Healthy Active Living (1998) contains the stories of 6 beginner exercisers. These people range in age, race, and physical abilities. This diversity increases the likelihood that a reader will perceive a similarity with at least one of the people. The similar other identified in the message encourages people to attend to the contents rather than view it as not applicable to them (Kopfman et al., 1998).

Persuasive Messages Used in the Present Study

In the current study, two written messages were used in an attempt to manipulate the coping self-efficacy of exercisers. One message was designed to encourage a potentially high enhancement of self-efficacy. The second message was designed to have a very minimal enhancement of self-efficacy. These two messages were given to separate groups of positive and negative thinkers (i.e., a 2 X 2 design: explained in detail in the methods section).

Based on self-efficacy theory (Bandura, 1997), it was expected that the greatest postmanipulation increase in coping self-efficacy would occur in negative thinkers exposed to a message that underscored the ease of adopting coping skills (i.e., the high coping self-efficacy message). Self-efficacy would also be expected to increase, albeit to a lesser extent, in negative thinkers exposed to a message that underscored the effort and time needed to adopt effective coping skills (i.e., the moderate coping self-efficacy message). These changes in

efficacy were expected because all of the negative thinkers should have premanipulation coping self-efficacy beliefs that are not well established and, as a result, amenable to change. Furthermore, it was expected that coping self-efficacy would be minimally or not at all enhanced in positive thinkers exposed to either the high or the moderate self-efficacy messages. The latter individuals would be expected to have high premanipulation self-efficacy levels and already be able to cope with their negative thoughts. Thus, verbal persuasion, while favourably received, may have little impact on the high self-efficacy, positive thinkers – especially if beliefs are at an upper ceiling of confidence.

Distinctiveness of Coping Self-Efficacy

If coping self-efficacy can be altered and a related influence on various psychological and behavioral variables occurs, then some preliminary insight about the influence of coping self-efficacy in the exercise domain would be provided. However, it is important to keep in mind the newness of the coping self-efficacy measure. As such, a secondary purpose of the current study was to examine the construct validity of this measure. Establishing construct validity requires convergence across different measures or manipulations of the same construct and divergence between measures and manipulations of related, but conceptually distinct, constructs (Cook & Campbell, 1979). As no convergent measures of coping self-efficacy exist within the exercise context, divergent validity was of interest in the current study. Divergent validity can be assessed through examination of correlations between the new measure and a preexisting measure that assesses either a similar or an unrelated construct (Kerlinger, 1973). Specifically, the former type of measure would be expected to have a modest correlation with the new measure. In contrast, the latter type of measure would be expected to have a very low

correlation with the new measure. Such correlations would provide some evidence of the divergent validity and the uniqueness of the new measure.

In the current study, scheduling self-efficacy was expected to correlate moderately well with coping self-efficacy. Scheduling self-efficacy refers to beliefs about one's skills and abilities to organize and schedule regular exercise (DuCharme & Brawley, 1995). Scheduling self-efficacy has been found to predict exercise intention and behavior in both novice and experienced exercisers (see McAuley & Mihalko, 1998, for a review of exercise-related efficacy measures). It is possible that exercisers who are confident in their scheduling abilities are also confident in their coping abilities because both efficacies are associated with the end result of regular exercise. However, these constructs should not be redundant because different abilities are tapped (i.e., scheduling well so that one exercises; coping with acute, negative thoughts so that one decides to exercise).

If these types of efficacies are not redundant, then they should explain significant, unique variation in dependent variables that are most correspondent with the efficacy type. In relation to the current study, coping self-efficacy is most correspondent with decision-making variables (i.e., decision struggle, exercise decision), affect experienced after exerting coping attempts, and coping-related behaviors. Thus, coping self-efficacy should predict these variables. When predicting decision struggle and exercise decision, scheduling self-efficacy should explain a smaller degree of variance compared to coping self-efficacy. Although beliefs in being able to schedule exercise may influence decision struggle and exercise decision, this type of behavioral belief is not as correspondent with the decision-related variables as is coping self-efficacy. Similarly, scheduling self-efficacy would not be expected to predict affective

reactions to coping (i.e., no correspondence). Furthermore, although it was previously outlined that coping self-efficacy may predict exercise intention, the inclusion of scheduling self-efficacy in a predictive model may explain a much greater amount of unique variance in intention due to the greater correspondence between scheduling self-efficacy (i.e., a behavioral belief) and exercise intention than between coping self-efficacy and exercise intention.

Method

Participants

Participants were 86 healthy people between the ages of 14 to 74 ($M_{age} = 25.51$ years; $SD = 9.24$ years). University students ($n = 60$) composed 70% of the sample, while professional, managerial, technical, and clerical occupations characterized the remaining 30% of the sample ($n = 26$). The majority of participants were female ($n = 75$). At the time of data collection, all participants were exercising in various community-based fitness clubs ($n = 43$) or university-based structured fitness classes ($n = 43$). Their exercise sessions included aerobic exercise (i.e., fitness classes or cardio machines) and weight training ($n = 53$), only fitness classes ($n = 28$), only weight training ($n = 3$), or only cardio machines ($n = 2$). On average, participants exercised 3.71 days each week ($SD = 1.24$ days).

In the four months prior to data collection, participants were exercising (a) inconsistently ($n = 59$) (i.e., exercised for less than 12 weeks of the possible 16 weeks), (b) consistently but not at a fitness club (i.e., home-based) ($n = 9$), or (c) inactive ($n = 18$). The first group of participants (i.e., inconsistent exercisers) exercised from 1 to 7 days each week ($M_{days} = 2.71$ days; $SD = 1.20$ days). They exercised during 7.67 weeks of the previous four months ($SD = 2.74$ weeks). Each exercise session lasted on average for 49.88 minutes ($SD =$

21.72 minutes) and typically involved the participants engaged in exercise at a club/university ($n = 22$), exercise on their own ($n = 20$), or a combination of exercise at a club/university and on their own ($n = 17$). Regardless of the type and duration of exercise, this group was clearly inconsistent in their exercise pattern (i.e., exercised, on average, for less than two months of the prior four months).

The second group of participants (i.e., home-based exercisers) exercised from 3 to 6 days each week ($M = 4.11$ days; $SD = 1.05$ days). They exercised during 13.33 weeks of the prior four months ($SD = 1.73$ weeks). Each session lasted on average for 62.78 minutes ($SD = 22.79$ minutes). Although this group was consistent in their prior exercise pattern, they were beginning exercise at a fitness club/university. Thus, based on the above demographic data, the present sample can be characterized as struggling with or beginning a new behavior.

Measures

Frequency of acute exercise thoughts. This open-ended measure required participants to (a) list the three most frequent thoughts they experienced when deciding whether to exercise as planned within a two week time frame (i.e., previous and current week) and (b) indicate how frequently they had each specific thought. Before doing these two tasks, participants were provided with a definition of positive and negative thoughts. Positive thoughts were defined as “those thoughts that encourage or make you consider attending the club in order to exercise regardless of your actual attendance.” Negative thoughts were defined as “those thoughts that discourage or make you consider not attending the club in order to exercise regardless of your actual attendance.” These definitions were the same as used in Study Two and were provided to ensure that all participants had common definitions as a frame of reference for their

subsequent responses. In addition, participants were instructed to list their three most frequent thoughts without reference to whether they were all negative, all positive, or some combination of the two. This procedure avoided problems of bias by allowing for responses that were the most cognitively available.

Each thought was coded as a negative thought, a positive thought, or an unclassifiable thought by the investigator in the same manner as in Study One. Specifically, thoughts coded as negative or positive conformed to the definitions provided in the preceding paragraph. Thoughts coded as unclassifiable were defined as those thoughts that the coder could not classify as either a negative thought or a positive thought. As in previous research (see Shapiro, 1994) and as in Study One, an overall thought frequency value was calculated by subtracting the total frequency of negative thoughts from the total frequency of positive thoughts.

Decision struggle. Participants indicated the extent to which their acute thoughts caused them to struggle with their exercise decision prior to exerting coping efforts. Specifically, after listing their three most frequent, acute thoughts, participants were asked “When you first have these thoughts, how much do they make you struggle with your decision to exercise at the club?”. Struggle was assessed on a 1 (no struggle) to 9 (tremendous struggle) scale. Thus, this measure assessed the overall struggle with decisions as a function of acute thoughts prior to coping.

Coping strategies. In order to provide participants with a frame of reference when identifying coping strategies, instructions initially focused respondents by requiring them to list their three most frequent negative thoughts that they experienced when deciding whether to

exercise as planned within a two week time period (i.e., previous and current week). Next, a general definition of a coping strategy was provided to ensure that participants had a common frame of reference (see Appendix G question C). This definition was followed by specific definitions of the positive thought and the positive behavior coping strategies (see Appendix G question C). These two broad-based types of coping strategies were derived from Study Two in which the majority of coping strategies were classified as one of these two types.

After reading these definitions, participants listed up to three coping strategies that they used to cope with their previously-listed negative thoughts. This task was completely open-ended. The coping strategies were then coded by the investigator as a (a) positive thoughts strategy, (b) positive behavior strategy, (c) combination of these two strategies, or (d) unclassifiable.

Coping self-efficacy. A multi-item measure of coping self-efficacy assessed participants' confidence in their abilities to use their previously listed coping strategies over the next two weeks when attempting to cope with negative thoughts about planned fitness sessions (see Appendix G question 2b). Specifically, coping self-efficacy was assessed for four of the most frequent acute thoughts that were identified in Study Two (i.e., not having the time/too busy, too tired, too much work to do, and lack of motivation to exercise). Each question was answered on a 0% (not at all confident) to 100% (completely confident) scale. A scale mean coping self-efficacy value for each participant was computed and used in the analyses. The measure exhibited good reliability (i.e., coefficient alpha = .89).

There were two main advantages to using a multi-item coping efficacy measure in the current study. First, multi-item measures show better predictive validity when compared to

single-item measures (Lee & Bobko, 1994). Second, multi-item measures may help differentiate individuals who differ in their levels of coping self-efficacy (cf. Bandura, 1997).

Scheduling self-efficacy. This measure assessed participants' confidence in their abilities to regularly complete eight specific behaviors in order to attend their planned fitness sessions over the next two weeks (see Appendix G question F). For each item, participants stated their confidence on a 0% (not at all confident) to 100% (completely confident) scale. A scale mean scheduling self-efficacy value for each participant was computed and used in the analyses. The measure exhibited good reliability (i.e., alpha coefficient = .93).

It is important to note that this measure was an edited version of a scheduling self-efficacy measure that has been employed in previous research (e.g., DuCharme & Brawley, 1995). Specifically, three items were deleted from the original measure because they assessed confidence to (a) overcome barriers to exercise which is distinct from scheduling confidence ($n = 1$: see McAuley & Mihalko, 1998) or (b) exercise elsewhere to make up for missed fitness club exercise which was not a focus of the current study ($n = 2$). Furthermore, the remaining items were reworded to better reflect the current action and context (e.g., exercise at the fitness club).

Exercise decision. This measure assessed the degree to which participants' decision of whether to exercise as initially planned was made easier or more difficult through their coping efforts. Specifically, participants were asked to "Circle the number that best indicates whether your decision to attend your fitness club will be made easier or more difficult when you use your coping tools in the next 2 weeks." They answered on a -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier) scale. Thus, this measure assessed the degree

to which decision was perceived to be influenced and not the actual decision of whether to exercise (i.e., yes/no).

Intention. Several different measures of intention were obtained in the current study. First, exercise intention was obtained using a measure of participants' behavioral self-prediction (cf. Fishbein & Stasson, 1990). Participants indicated the weekly number of times they would exercise at the fitness club/university during the next two weeks. Then, the strength of this self-prediction was indicated on a 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many) scale (see Appendix G question F). The latter strength value was used in the analyses based on suggestions by Fishbein and Stasson (1990). In general, they suggest that a behavioral self-prediction measure of intention is correspondent with measures of self-efficacy (i.e., measures of perceived control). Specifically, the extent to which individuals can accurately predict whether they will behave (i.e., behavioral self-prediction) is partially determined by the extent to which individuals perceive control over the behavior (Fishbein & Stasson, 1990). Ensuring correspondence in the current study between coping and scheduling self-efficacy and exercise behavioral self-prediction (i.e., exercise intention) was deemed important due to the hypotheses of interest (i.e., prediction of intention from these two efficacies).

Furthermore, postmanipulation intention to engage in coping-related behaviors (i.e., to learn more about coping with acute, negative thoughts) was obtained using a measure of participants' behavioral self-prediction (cf. Fishbein & Stasson, 1990). Specifically, participants indicated the strength of their intention to (a) attend a free workshop and (b) read a

pamphlet that would be mailed to them about coping with negative thoughts.⁶ Strength of these intentions were assessed on a 1 (definitely will not) to 9 (definitely will) scale (see Appendix H question H). As previously outlined, intention to perform these behaviors may be an important precursor to eventual exercise adherence. A single variable, coping-related behavioral intention, was created for each participant and used in the analyses. Specifically, for each participant, the intention value used for this variable was the highest value from the two previously outlined intention measures (i.e., attend a workshop or read a pamphlet). For example, a participant may have indicated a low intention to attend the workshop (i.e., a value of two on a nine-point scale) and a very high intention to read the pamphlet (i.e., a value of nine). In this example, this latter intention value would be used in the analyses. Selection of the intention value in this manner ensured that intention to perform the self-regulatory behavior that was most relevant to each participant was used in the analysis. A similar procedure has been previously employed in exercise research (e.g., DuCharme & Brawley, 1995).

Finally, as a check on whether the messages were effective in promoting use of the positive thoughts and the positive behavior strategies, two additional measures of intentions were assessed postmanipulation. These measures were intention to use: (a) the positive thoughts and (b) the positive behavior coping strategies. For each type of strategy, participants indicated the strength of their intention to use the strategy on a 1 (definitely will not use) to 9 (definitely will use) scale (see Appendix H question I).

Coping-related behavior. Two measures of behavior were obtained postmanipulation. First, participants were instructed to write their name and telephone number if they wished to

⁶The workshop and pamphlet were never provided in reality.

be contacted for the time of a workshop on learning to cope with negative thoughts. Second, they were instructed to write their complete mailing address if they wished to be mailed a pamphlet on the same topic. For the analyses, one coping-related behavior variable was created. This variable was coded as a 'yes' (i.e., chose at least one behavior) or a 'no' (i.e., chose no behaviors). Specifically, participants who chose to engage in at least one of the workshop or the pamphlet behaviors were coded as a 'yes.' Participants who chose not to engage in these behaviors were coded as a 'no.'

This assessment of multiple behaviors has been employed in other research (e.g., attitudes: see Olson & Zanna, 1983). This type of assessment is particularly important when various behaviors must be performed in order to produce a specific outcome. For example, exercise adherence results from a variety of behaviors which may include packing workout clothes in a gym bag, scheduling a time to exercise, and, pertaining to the current study, attending workshops or reading about coping with negative thoughts.

It is also important to note that these two types of behaviors were assessed rather than exercise behavior for two reasons. First, the coping-related behaviors were more correspondent to the type of efficacy belief that was a focus of the study (i.e., coping self-efficacy). As Bandura (1997) and McAuley and Mihalko (1998) have suggested, correspondence between efficacy beliefs and behavior may enhance the predictiveness of the former construct. Second, verbal persuasion is hypothesized to produce an immediate impact on efficacy beliefs and subsequent behavior (self-efficacy theory: Bandura, 1997). Since the sample completed the questionnaire after an exercise session, an immediate impact on exercise behavior could not have been assessed. For many participants, exercise behavior would not occur for at least two

subsequent days. In contrast, opportunities to complete related behaviors were provided to respondents with the view that these behaviors would be corresponding options that might be selected if participants were motivated by the persuasive message.

Affect. This measure assessed participants' affective responses after attempting to cope with their negative thoughts (see Appendix G question D). Participants indicated the extent to which they experienced nine affective reactions. The affects typically represent reactions to outcomes and attributions and take the form of positive (i.e., happy, pleased, competent, and proud) or negative (i.e., ashamed, depressed, guilty, upset, and disappointed) affect (Courneya & McAuley, 1993). Each affect was assessed on a 1 (don't feel at all) to 9 (feel very much) scale. For analyses, the negative affect items were reverse scored and added to the positive affect items. Higher scores reflected positive affect while lower scores reflected negative affect. The measure exhibited good reliability (i.e., alpha coefficient = .71).

Procedure and Design

Individuals who were active members of fitness clubs or who were actively participating in fitness classes at various universities were approached after a designated exercise session for participation in the study. Individuals who agreed to participate completed a questionnaire at this time (see Appendix G). This questionnaire was comprised of demographic, prior four month exercise pattern, frequency of acute thoughts, decision struggle, negative thoughts, coping strategies, coping self-efficacy, exercise decision, affect, exercise intention, and scheduling self-efficacy questions.⁷

⁷The university-based questionnaire was modified slightly from the fitness club questionnaire. The words "fitness club" were replaced by the word "university". This ensured that all participants perceived the questionnaire as relevant to their exercise context.

Based on the participants' prior four month exercise pattern (see Appendix G Past Exercise section), individuals were then classified into one of four groups: (a) inactive: no exercise in the previous four months, (b) beginner: consistent exercise but not at a fitness club/university in the prior four months, (c) inconsistent: inconsistent exercise (i.e., less than 12 weeks in the prior four months), and (d) consistent: exercise consistently at a fitness club/university (i.e., 12 weeks or more of exercise in the prior four months).

Only individuals classified as an inactive, a beginner, or an inconsistent exerciser were retained for potential inclusion in the coping self-efficacy manipulation. This procedure excluded 74 individuals. The remaining 86 individuals were then classified as positive, negative, or neutral thinkers. Positive thinkers had an overall thought frequency value of one or greater ($\underline{n} = 35$). Negative thinkers had an overall thought frequency value of minus one or less ($\underline{n} = 50$). Neutral thinkers had an overall thought frequency value of zero (i.e., an equal number of positive and negative thoughts) ($\underline{n} = 1$). Subsequently, positive and negative thinkers were randomly assigned to the high or the moderate coping self-efficacy message conditions. This procedure resulted in (a) 18 positive thinkers in the high self-efficacy message condition, (b) 17 positive thinkers in the moderate self-efficacy message condition, (c) 25 negative thinkers in the high self-efficacy message condition, and (d) 25 negative thinkers in the moderate self-efficacy message condition. The finding of a greater number of negative thinkers (i.e., $\underline{n} = 50$) than positive thinkers (i.e., $\underline{n} = 35$) was similar to Study One. Furthermore, this finding was not surprising considering the sample consisted of beginner and inconsistent exercisers.

Similar to Study One, in order to determine if between-group differences existed in

premanipulation social cognitive variables and if the messages produced hypothesized changes in coping self-efficacy, extreme groups of positive and negative thinkers were identified and used in all of the analyses. The rationale for using only extreme groups in the analyses was that individuals most likely to exhibit differences in their social cognitions and behavior would be those individuals who were most extreme in their acute thoughts. Careful analysis of the thought frequency data at Time 1 and logical considerations resulted in the extreme (a) positive group having a thought frequency of greater than or equal to two and (b) negative group having a thought frequency of less than or equal to minus two. Selection of these frequency values (a) ensured the minimum sufficient numbers of participants within each condition of the experiment at Time 1 and Time 2 (i.e., at least 10 participants in each cell: Tabachnik & Fidell, 1996) and (b) comparison with some of the Study One results because the thought frequency values for extreme group analysis were the same.

This procedure resulted in the following number of participants in each condition of the study at Time 1: (a) positive thinker/high coping self-efficacy message: $n = 17$, (b) positive thinker/moderate coping self-efficacy message: $n = 15$, (c) negative thinker/high coping self-efficacy message: $n = 20$, and (d) negative thinker/moderate coping self-efficacy message: $n = 24$.

Two weeks after participants completed the first questionnaire, they were approached after another designated exercise session. At this time, they were instructed to carefully read an exercise pamphlet. In reality, the pamphlet was the high or the moderate coping self-efficacy message (see Appendix I for the messages). Participants were told that the questionnaire contained a pamphlet on how to cope with negative thoughts and that it was written by the

investigator. They were also told that their opinion on this pamphlet was wanted. These instructions were divulged in order to hide the true purpose of the messages (i.e., the manipulation of coping self-efficacy). Subsequently, participants read the pamphlet and completed another questionnaire⁸ (see Appendix H). This questionnaire assessed participant's opinion of the pamphlet (i.e., message quality), frequency of acute thoughts, decision struggle, negative thoughts, coping strategies, coping self-efficacy, exercise decision, affect, exercise intention, scheduling self-efficacy, intention to attend a workshop and related behavior, intention to read another pamphlet and related behavior, intention to use the positive thoughts strategy and the positive behavior strategy. After completing the questionnaire, participants were debriefed about the true purpose of the study (see Appendix J). In summary, the study was a 2 (type of thinker) X 2 (type of message) X 2 (time) mixed design with repeated measures on the last factor.

It is important to note that since the investigation was conducted in the field, study attrition was identified as a potential problem. Similar to clinical trials, the offering of an incentive was used in an attempt to combat this potential problem. Participants who were exercising at the fitness clubs were offered a free tanning session if they completed both questionnaires. They also qualified for a draw to win a gift certificate from a local restaurant. Participants who were exercising at a university were offered the latter incentive only (i.e., since tanning beds were not available at the university).

Coping self-efficacy manipulation. Two written messages were designed to manipulate

⁸The questionnaire for the university-based participants was modified slightly from the questionnaire for the fitness club participants. Specifically, the words "fitness club" were replaced by the word "university."

coping self-efficacy (see Appendix I). The first message was designed to persuade participants that coping with acute, negative thoughts was extremely easy (i.e., a high coping self-efficacy message). In contrast, the second message was designed to persuade participants that coping with acute, negative thoughts was somewhat difficult but achievable (i.e., a moderate coping self-efficacy message). Specifically, both messages contained information on how to cope with negative thoughts (i.e., positive thoughts and behavior strategies). However, the high efficacy message contained information that the strategies were very easy to implement (e.g., “positive thoughts tool is very easy to learn”; “remarkably easy to use”; “only require a little bit of focus”), have been found to work well when similar others have employed the strategies (e.g., “to work extremely well when other fitness club exercisers had negative thoughts”; “they overcome their immediate negative thoughts about 90% of the time”), and that successful coping would occur immediately (e.g., “this tool works almost immediately”; “help you decide to stick with your plans to exercise”). In contrast, the moderate self-efficacy message contained information that the strategies took some time and effort to implement (e.g., “it takes a lot of experience and practice”; “this tool may be difficult to use at first”) and that successful coping would eventually result if coping efforts were persistent over time (e.g., “eventually though, with persistence and practice, this tool will be of benefit”; “if used for long enough, this strategy may help you decide to stick with your plans to exercise”).⁹

It is important to note that outcome expectancies were controlled in both of these messages. Specifically, positive outcome expectancies (i.e., incentives) that are typically

⁹The messages provided to the university-based participants were modified slightly from the messages provided to the fitness club participants. Specifically, the words “fitness club” were replaced by the word “university.”

associated with exercise participation were included in the messages. These outcome expectancies included the three major incentive types of (a) positive, physical (e.g., toning muscles, losing weight), (b) positive, social (e.g., other people noticing how good you look), and (c) positive, self-evaluative (e.g., feeling better about yourself) (self-efficacy theory: Bandura, 1997). Controlling for these outcome expectancies was an attempt to ensure that (a) participants perceived an adequate and uniform incentive associated with performing the behavior (self-efficacy theory: Bandura, 1997) and (b) the effect of outcome expectancies, which is an integral construct in self-efficacy theory (Bandura, 1997), was constant across the two manipulations.

Message quality. In order to determine if participants perceived that the message they read contained the qualities that have been suggested as being persuasive, they were asked a series of questions about the message. Recall that for a persuasive message to be effective, the message must be perceived by the readers as informational, credible, understandable, and designed for people like themselves (Bandura, 1997; Kopfman et al., 1998). In the current study, participants answered questions (i.e., 6 items) with respect to these message attributes on a 1 (strongly disagree) to 9 (strongly agree) scale (see Appendix H question A).

Analyses

Presentation of Results

Results are presented in four major sections. The first major section presents the number of participants lost to study attrition at Time 2. The second major section contains Time 1 (premanipulation) results. The third major section contains Time 2 (postmanipulation) results. Both sections two and three follow the same order of data presentation. First,

descriptive statistics for the primary variables of interest in the study are presented. Second, bivariate correlations among the primary variables are presented. These bivariate correlations provide information on the degree of linear association between the primary variables. Third, hierarchical multiple regressions involving the primary variables are presented. These regressions were conducted in order to investigate the hypotheses of interest. Fourth, a multivariate analysis of variance (Time 1) or various analyses of covariance (Time 2) are presented. In general, these tests were conducted in order to examine study hypotheses regarding characteristic differences between positive and negative thinkers as well as to examine the effectiveness of the persuasive messages in producing the hypothesized effects.

The fourth major section of the results compares and contrasts participants who adhered to the study (i.e., received the manipulation) to participants who did not adhere to the study (i.e., did not receive the manipulation) on the primary variables of interest at Time 1. This section provides information on the selective attrition of participants from the study. Since study attrition may have compromised the initial randomization of participants to treatment groups and since study attrition involved a large number of participants from Time 1, a thorough analyses of study adherers and dropouts is presented.

Missing Data

Missing data consisted of missing items or sections on the questionnaires at Time 1 or at Time 2. Specifically, at Time 1, seven of the 86 questionnaires (i.e., 8%) had missing data. At Time 2, of those participants who were exposed to the manipulation and returned a questionnaire, five of the 54 questionnaires (i.e., 9%) had missing data. The amount of missing data was minimal. Furthermore, the data were missing in a random pattern. As a result, two

different data substitution procedures were employed (Linton & Gallo, 1975; Tabachnik & Fidell, 1996). First, if the value for a scale item was missing, then the participant's mean for the remaining items on the scale was substituted. Second, if the values for an entire scale were missing, then the sample mean of the scale was substituted. The advantage to using data substitution procedures is that power in a study is not compromised by a few missing data points (i.e., no listwise deletion in the analyses after data substitution). The disadvantage to the use of these procedures is that sample variability is reduced. Thus, study results can be biased in a conservative direction (Tabachnik & Fidell, 1996).

Outliers

Each participant's values for the primary variables at Time 1 and Time 2 were screened for potential outliers. Screening for outliers is important for two reasons (Tabachnik & Fidell, 1996). First, outliers may lead to Type I or Type II errors and it is difficult to determine which effect that outliers have in specific analyses. Second, outliers can lead to nongeneralizable results. Specifically, results may be overly influenced by the outliers.

Screening for outliers involves at least two procedures (Tabachnik & Fidell, 1996). First, z -scores for each variable can be calculated. A z -score that is greater than 3.29 suggests that the case is an outlier. Second, histograms for each variable can be inspected for outliers. Outliers are cases that are unattached to the remainder of the distribution. In the present study, these two procedures aided in the identification of three outliers. All three outliers occurred on the overall thought frequency value at Time 1. Specifically, three participants provided acute, thought frequency values that were either extremely negative (i.e., - 37) or extremely positive (i.e., 27; 52).

Based on suggestions by Tabachnik and Fidell (1996), these outliers were handled in following manner. Since the outliers were sampled from the target population (i.e., beginner exercisers or inconsistent exercisers), the outliers remained in the data set but a step was employed to reduce their impact. As recommended by Tabachnik and Fidell (1996), the scores were changed so that they were less deviant. The extreme negative score was changed to one unit less than the next most extreme, negative thought frequency score (i.e., -37 to -21). The extreme positive scores were changed to one unit more than the next most extreme, positive thought frequency score (i.e., 27 to 13; 52 to 14). All of the following analyses were performed with these changes on the outliers.

Results

Study Attrition

When the study began, 86 participants fit the criteria for study inclusion (i.e., beginner exercisers, inactive, or inconsistent exercisers). Of these 86 participants, 76 met the criteria for inclusion in the message manipulation groups (i.e., had a thought frequency value of greater than or equal to plus two or had a thought frequency value of less than or equal to minus two). Of these latter individuals, 22 (i.e., 29%) were lost to study attrition at Time 2 (i.e., did not complete the Time 2 questionnaire). As seen in Table 8, the attrition from each condition was (a) positive thinker/high efficacy message: one individual, (b) positive thinker/moderate efficacy message: two individuals, (c) negative thinker/high efficacy message: nine individuals, and (d) negative thinker/moderate efficacy message: 10 individuals. Thus, the attrition was clearly selective and biased by negative thinkers.

It is important to note that steps were taken in an attempt to prevent study attrition.

First, incentives were offered to the participants for adhering to the study (i.e., free tanning session; draw to win a gift certificate). Second, individuals who did not receive a questionnaire at Time 2 (i.e., were not present when the questionnaire was administered) were called up to four times by the investigator. During each call, individuals were informed that their questionnaire was located in a designated location at the club/university and they were asked to complete the questionnaire as soon as possible. Third, the investigator returned to the club on two occasions and to the university on one occasion in an attempt to physically locate these individuals. Despite these efforts, study attrition could not be prevented.

Table 8

Study Attrition by Condition.

Time	Condition			
	Positive thinker/ high message	Positive thinker/ moderate message	Negative thinker/ high message	Negative thinker/ moderate message
	(n)	(n)	(n)	(n)
Time 1	17	15	20	24
Time 2	16	13	11	14
Attrition	1	2	9	10

Note. The sample sizes in each condition are for extreme positive and negative thinkers only (i.e., an overall, acute thought frequency of greater than or equal to two or less than or equal to minus two).

Time 1 (Premanipulation) Descriptives

Unless otherwise noted, all of the following results are for the extreme positive and the extreme negative groups who were eligible for exposure to the message manipulation at Time 2 (i.e., overall acute thought frequency value at Time 1 of greater than or equal to two or less than or equal to minus two).

Primary variable descriptives. Table 9 contains the means and standard deviations of the primary variables of interest. Positive thinkers indicated a higher frequency of acute, positive thoughts and a lower frequency of acute, negative thoughts than negative thinkers. Furthermore, positive thinkers indicated that they struggled little with their decision to exercise as planned when they first had their most frequent thoughts (i.e., prior to coping). Negative thinkers indicated more of a struggle (i.e., a moderate struggle).

As expected, positive thinkers had fairly high coping self-efficacy whereas the negative thinkers were somewhat less confident. However, both positive and negative thinkers indicated that when they used their coping strategies that their decision to exercise was made easier and that they would experience a somewhat positive affect.

Although positive and negative thinkers intended to exercise three times each week for the subsequent two weeks ($SD_{\text{positive}} = 1.12$; $SD_{\text{negative}} = 1.03$), their strength of behavioral self-prediction varied. Not surprisingly, negative thinkers had a somewhat lower behavioral self-prediction value than positive thinkers. Finally, positive thinkers had a fairly high scheduling self-efficacy. Negative thinkers were less confident in this ability.

Table 9

Time 1 Primary Variables: Descriptives for Positive and Negative Thinkers

Variable	Positive thinkers ^a	Negative thinkers ^b
	(M)	(M)
Positive thought frequency	7.44 (3.40)	1.16 (1.84)
Negative thought frequency	1.47 (2.27)	8.41 (5.13)
Overall thought frequency	6.28 (3.24)	-7.25 (5.25)
Decision struggle	3.47 (1.98)	5.24 (1.53)

Note. Standard deviations are reported in parentheses. Decision struggle was measured on a 1 (no struggle) to 9 (tremendous struggle) scale.

^an = 32. ^bn = 44.

table continues

Table 9

Time 1 Primary Variables: Descriptives for Positive and Negative Thinkers

Variable	Positive thinkers ^a	Negative thinkers ^b
	(M)	(M)
Coping self-efficacy	77.58 (15.84)	69.29 (21.51)
Exercise decision	2.72 (1.36)	2.67 (1.16)
Exercise intention	8.22 (1.01)	7.64 (1.38)
Affect	40.94 (9.71)	39.89 (10.71)
Scheduling self-efficacy	82.51 (18.00)	78.43 (19.29)

Note. Standard deviations are reported in parentheses. Coping and scheduling self-efficacy were measured on a 0% (not at all confident) to 100% (completely confident) scale. Exercise decision was measured on a -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier) scale. Exercise intention was measured on a 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many) scale. Affect was measured on a 1 (don't feel at all) to 9 (feel very much) scale. Mean affect was the mean of participants' summed affect scores and could have ranged from 9 to 81.

^an = 32. ^bn = 44.

Secondary variable descriptives. Examination of the type of acute thoughts that positive and negative thinkers experienced revealed several findings (see Appendix K for type of thoughts and associated frequencies). First, in both groups, positive thoughts about various physical outcome expectancies of exercising were the most frequent type of thought reported (e.g., more fit, weight control). Second, the positive thinkers also reported experiencing a high frequency of motivational/affective thoughts (e.g., motivated to exercise, enjoyment of exercise). Third, both groups most frequently reported negative thoughts about being too tired to exercise. Fourth, the negative thinkers also frequently reported negative thoughts about a general lack of time (e.g., no time, too busy) and thoughts about having specific commitments (e.g., work-related).

When attempting to deal with their acute, negative thoughts, both groups most frequently reported use of the positive thoughts coping strategy (see Appendix L). This was followed by use of the positive behavior strategy and, in a very few cases, by a combination of the two strategies.

Time 1 (Premanipulation) Bivariate Correlations

The bivariate correlations for the primary variables in both extreme positive and negative thinkers are presented in Table 10. As expected, coping self-efficacy was negatively correlated with decision struggle and positively correlated with exercise decision, exercise intention, and scheduling self-efficacy ($ps < .05$). The bivariate correlation between coping self-efficacy and scheduling self-efficacy did not indicate statistical redundancy between these two constructs (i.e., $r < .80$). Contrary to expectations, coping self-efficacy was not significantly correlated with affect. Scheduling self-efficacy was related to decision struggle

and exercise decision, but a stronger relationship with exercise intention was observed. Also, as expected, scheduling self-efficacy and affect were not significantly related.

Some of these associations remained the same and some differed when the bivariate correlations were examined within the extreme (a) positive thinkers and (b) negative thinkers (see Appendix M). This suggests that the degree of association between some social cognitive variables differs between extreme positive and negative thinkers.

Table 10

Time 1 Bivariate Correlations Between Primary Variables

Variable	1	2	3	4	5	6	7
1. Coping self-efficacy	–	.21	-.43**	.35**	.34**	-.10	.66**
2. Thought frequency		–	-.34**	.02	.14	.02	.14
3. Decision struggle			–	-.15	-.27*	.21*	-.36**
4. Exercise decision				–	.13	.02	.33**
5. Exercise intention					–	.04	.53**
6. Affect						–	-.11
7. Scheduling self-efficacy							–

Note. $n = 76$.

* $p < .05$. ** $p < .01$.

Time 1 (Premanipulation) Hierarchical Multiple Regressions

A series of hierarchical multiple regression analyses were conducted in order to examine the hypotheses of interest in the current study. Within each hierarchical regression, the predictors that were included and their order of entry was determined after theoretical and logical considerations (cf. Tabachnik & Fidell, 1996). Predictors that were hypothesized by theory to be related to and that were more correspondent with the criterion were entered prior to other predictors. For example, scheduling self-efficacy was entered before coping self-efficacy in the prediction of behavioral intention to exercise.

However, it is important to note that in each hierarchical regression, a dummy variable, called type of thinker, was entered first. This dummy variable was a dichotomous variable and represented each participant as being either a positive or a negative thinker based on their overall thought frequency value. The dummy variable was entered first in order to control for any effects it may have exerted on the criterion variable. Thus, initial differences in whether participants were positive or negative thinkers were held constant in order to examine the added, independent influence of all other social cognitive predictors on the criterion variable.

Decision struggle. Type of thinker, coping self-efficacy, and scheduling self-efficacy were regressed on decision struggle. The overall model was significant. Type of thinker and, as expected, coping self-efficacy significantly and independently predicted participants' decision struggle (i.e., R^2 change for thinker = .21; R^2 change for coping self-efficacy = .12) (see Table 11). The addition of scheduling self-efficacy did not explain significant variance in decision struggle (see Table 11). This latter finding was not unexpected considering the lower degree of correspondence between this behavioral form of self-efficacy and the cognitive

rumination and effort that characterizes struggles in decision-making (i.e., compared to coping self-efficacy).

Exercise decision. As seen in Table 11, type of thinker, coping self-efficacy, scheduling self-efficacy, and decision struggle were regressed on exercise decision. The overall model was significant. As expected, coping self-efficacy accounted for a significant amount of variance in exercise decision (R^2 change = .13). None of the other variables included in this model were significant, independent predictors.

Table 11

Time 1 Hierarchical Multiple Regressions: Struggle and Exercise Decision

Criterion	Predictor	R^2 change	R^2 adjusted	p
Struggle			.31	.0001
	Thinker	.21		.0001
	Coping self-efficacy	.12		.001
	Scheduling self-efficacy	.02		.21
Exercise decision			.10	.02
	Thinker	.001		.87
	Coping self-efficacy	.13		.002
	Scheduling self-efficacy	.02		.23
	Decision struggle	.001		.99

Note. For each hierarchical regression, $n = 76$.

Exercise intention. Type of thinker, scheduling self-efficacy, and coping self-efficacy were regressed on exercise intention. As seen in Table 12, the overall model was significant. Type of thinker (R^2 change = .05) and scheduling self-efficacy (R^2 change = .26) were significant, independent predictors. The finding that scheduling and not coping self-efficacy was a significant predictor was not surprising. Scheduling self-efficacy has a greater degree of correspondence (i.e., efficacy for behavioral abilities) with the criterion (i.e., intention to perform exercise behavior) than coping self-efficacy (i.e., efficacy for coping with thoughts).

Affect. Type of thinker, coping self-efficacy, exercise decision, and struggle were regressed on affect. Contrary to expectations, the overall model was not significant (see Table 12).

Table 12

Time 1 Hierarchical Multiple Regressions: Exercise Intention and Affect

Criterion	Predictor	R ² change	R ² adjusted	p
Exercise intention			.28	.0001
	Thinker	.05		.05
	Scheduling self- efficacy	.26		.0001
	Coping self-efficacy	.002		.69
Affect			.02	.23
	Thinker	.002		.67
	Coping self-efficacy	.01		.33
	Exercise decision	.003		.61
	Decision struggle	.06		.04

Note. For each hierarchical regression, $n = 76$.

Time 1 (Premanipulation) Multivariate Analysis

In order to examine whether differences in various social cognitive variables existed between the extreme positive thinkers ($n = 32$) and the extreme negative thinkers ($n = 44$) prior to manipulation, a one-way multivariate analysis of variance was conducted. Specifically, the independent variable was type of thinker (i.e., positive/negative). The dependent variables were coping self-efficacy, decision struggle, exercise decision, exercise intention, and affect.

Prior to conducting the multivariate analysis, a t -test revealed that the two groups significantly differed on overall, acute thought frequency, $t(72) = 13.53$, $p < .0001$. A one-way MANOVA was then conducted. Results revealed that assumptions underlying the use of the MANOVA were met (i.e., nonsignificant Levene's and Box's tests: $ps > .05$). The overall MANOVA was significant, $F(5, 70) = 4.23$, Pillai's Trace = .24, $p < .001$.

Subsequent univariate F -tests revealed that the negative thinkers (a) struggled significantly more with their decision prior to coping, $F(1, 74) = 19.28$, $p < .0001$ (power = .99; $\eta^2 = .21$) and (b) had a significantly lower intention to exercise, $F(1, 74) = 4.09$, $p < .05$ (power = .52; $\eta^2 = .05$) than the positive thinkers. Furthermore, although not significant, the means for coping self-efficacy were in the predicted direction with the negative thinkers having lower coping self-efficacy than the positive thinkers, $F(1, 74) = 3.40$, $p > .07$ (power = .45; $\eta^2 = .05$). Exercise decision, $F(1, 74) = .03$, $p > .10$ (power = .05; $\eta^2 = .0001$), and affect, $F(1, 74) = .18$, $p > .10$ (power = .07; $\eta^2 = .002$), did not significantly differ between the groups. All means are displayed in Table 13.

In summary, negative thinkers struggled more with their decision immediately after having acute thoughts and had a lower intention to exercise than their positive counterparts.

Further, differences between these groups on coping self-efficacy were in the hypothesized direction with the former group having a lower efficacy than the latter group.

Table 13

Time 1 Comparison of the Means of Positive and Negative Thinkers

Variable	Positive thinkers ^a	Negative thinkers ^b	p
	(M)	(M)	
Coping self-efficacy	77.58 (15.84)	69.29 (21.51)	.07
Decision struggle	3.47 (1.98)	5.24 (1.53)	.0001
Exercise decision	2.72 (1.36)	2.67 (1.16)	.87
Exercise intention	8.22 (1.01)	7.64 (1.38)	.05
Affect	40.90 (9.71)	39.89 (10.25)	.67

Note. Standard deviations are reported in parentheses. Measurement scale for coping self-efficacy was 0% (not at all confident) to 100% (completely confident), decision struggle was 1 (no struggle) to 9 (tremendous struggle), exercise decision was -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier), exercise intention was 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many), affect was 1 (don't feel at all) to 9 (feel very much) scale and could have ranged from 9 to 81.

^an = 32. ^bn = 44.

Time 2 (Postmanipulation) Descriptives

All of the following results are for the extreme positive and negative thinkers who adhered to the study at Time 2 (i.e., exposed to message manipulation and returned the questionnaire). Sample sizes for each group by condition have been previously reported in Table 8.

Primary variable descriptives. Means and standard deviations of the primary variables are presented in Table 14. Participants who were classified as positive thinkers at Time 1 indicated a higher frequency of negative than positive thoughts at Time 2. Despite this overall negative thought frequency, the positive thinkers indicated that they struggled little with their decision to exercise as planned prior to exerting efforts to cope with their acute thoughts. More will be said about the reason for this apparent shift in acute thinking in the discussion. It is important to note that a similar shift did not occur in negative thinkers. These thinkers maintained but did not increase their acute, negative thinking pattern. They also continued to indicate a moderate decision struggle.

Both positive and negative thinkers had a fairly high coping self-efficacy. Both groups also indicated that when they used their coping strategies their decision to exercise was made easier. Further, both groups indicated that after exerting coping efforts, they experienced a high degree of positive affect.

Similar to Time 1, positive and negative thinkers intended to exercise, on average, three times each week for the subsequent two week period ($SD_{\text{positive}} = 1.20$; $SD_{\text{negative}} = .99$). The strength of this behavioral self-prediction was quite high in both types of thinkers. As well, negative thinkers expressed a higher degree of scheduling self-efficacy than positive thinkers.

Focussing on coping-related behavioral intention, positive and negative thinkers indicated an above average intention to engage in a coping related behavior (i.e., $M_{\text{positive}} = 6.45$, $SD = 2.64$; $M_{\text{negative}} = 6.96$, $SD = 2.85$). Focussing on coping-related behavior, 18 positive thinkers chose to engage in the coping-related behavior of reading a pamphlet and one positive thinker chose to attend the workshop. Ten positive thinkers chose not to engage in either of these behaviors. Similarly, 17 negative thinkers chose to engage in the behavior of reading a pamphlet and one negative thinker chose to attend the workshop. Seven negative thinkers chose not to engage in either of these behaviors. Finally, both positive and negative thinkers indicated a fairly strong intention to use the positive thoughts and positive behavior coping strategies.

Table 14

Time 2 Primary Variables: Descriptive for Positive and Negative Thinkers

Variable	Positive thinkers ^a	Negative thinkers ^b
	(M)	(M)
Positive thought frequency	3.07 (3.10)	2.80 (3.65)
Negative thought frequency	5.14 (4.58)	5.20 (4.05)
Overall thought frequency	-2.07 (6.49)	-2.40 (6.66)
Decision struggle	3.83 (2.10)	4.65 (1.63)

Note. Standard deviations are reported in parentheses. Time 2 participants were those who remained in the study. Positive and negative categorization was based upon Time 1 acute thought frequency. Decision struggle was measured on a 1 (no struggle) to 9 (tremendous struggle) scale.

^an = 29. ^bn = 25.

table continues

Table 14

Time 2 Primary Variables: Descriptive for Positive and Negative Thinkers

Variable	Positive thinkers ^a	Negative thinkers ^b
	(M)	(M)
Coping self-efficacy	78.92 (17.27)	79.91 (14.13)
Exercise decision	2.69 (1.26)	2.58 (1.19)
Exercise intention	8.07 (.75)	7.96 (1.34)
Affect	64.31 (13.71)	65.35 (10.81)
Scheduling self-efficacy	83.34 (17.45)	86.04 (14.77)

Note. Standard deviations are reported in parentheses. Time 2 participants were those who remained in the study. Measurement scale for coping and scheduling self-efficacy was 0% (not at all confident) to 100% (completely confident), exercise decision was -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier), exercise intention was 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many), and affect was 1 (don't feel at all) to 9 (feel very much).

^an = 29. ^bn = 25.

Secondary variable descriptives. Following perusal of the persuasive message, positive and negative thinkers most frequently reported positive thoughts about various physical outcome expectancies (e.g., tone muscles, weight control) and psychological outcome expectancies (e.g., feelings of increased energy) of exercising (see Appendix N for the type of thoughts and associated frequency). Both groups frequently reported negative thoughts about being too tired to exercise, general time-related thoughts (e.g., too busy, no time), and thoughts about specific commitments (e.g., job-related work). When attempting to cope with their acute, negative thoughts, both groups most frequently reported use of the positive thoughts coping strategy followed by the positive behavior strategy (see Appendix O).

Message quality and content. Descriptives for message quality (see Table 15) indicated that both positive and negative thinkers agreed that the message they read was informational, aimed at people like them, easy to read and understand, and that the information contained in the message was accurate.¹⁰ These findings suggest that the participants perceived the messages to contain the qualities presumed to assist in persuasion (Bandura, 1997; Kopfman et al., 1998). Furthermore, both positive and negative thinkers indicated a high intention to use the positive thoughts (i.e., $M_{\text{positive}} = 7.41$, $SD = 1.45$; $M_{\text{negative}} = 7.32$, $SD = 1.99$) and the positive behavior (i.e., $M_{\text{positive}} = 7.41$, $SD = 1.68$; $M_{\text{negative}} = 7.16$, $SD = 2.13$) coping strategies. Taken together, these results suggest that the messages were clear and accepted by the participants.

¹⁰A similar pattern of findings was observed when message quality was assessed within each group by condition cell (see Appendix P).

Table 15

Participants' Views of Message Quality and Acceptance

Pamphlet variable	Positive thinker ^a	Negative thinker ^b
	(M)	(M)
Informational	6.79 (1.37)	7.44 (1.12)
Aimed at people like me	6.55 (1.78)	6.52 (2.10)
Believable	7.24 (1.68)	7.16 (1.80)
Easy to read	7.62 (1.32)	7.36 (1.18)
Easy to understand	7.97 (1.43)	7.64 (1.52)
Information was accurate	7.00 (1.63)	6.64 (1.91)
Overall mean	7.20 (1.14)	7.12 (1.18)

Note. Standard deviations are reported in parentheses.

^an = 29. ^bn = 25.

Time 2 (Postmanipulation) Bivariate Correlations

The bivariate correlations for the primary variables for the sample at Time 2 are presented in Table 16. Similar to the bivariate correlations at Time 1, coping self-efficacy was negatively correlated with decision struggle and positively correlated with exercise intention and scheduling self-efficacy ($p_s < .05$). Similar to Time 1, the bivariate correlation between coping self-efficacy and scheduling self-efficacy provided no evidence of statistical redundancy among these two constructs (i.e., $r < .80$). Coping self-efficacy was also positively correlated with affect ($p < .05$). This significant association was not found at Time 1. Contrary to expectations and to findings at Time 1, coping self-efficacy was not significantly correlated with exercise decision. Further, coping self-efficacy was not significantly related to coping-related behavioral intention and coping-related behavior. Exercise decision was the only variable significantly and positively related to coping-related intention ($p < .01$). Exercise decision and coping-related intention were significantly and positively related to coping-related behavior.

Some of these associations remained the same and some differed when the bivariate correlations were examined within the extreme (a) positive thinkers and (b) negative thinkers (see Appendix Q). One reason for these differences may be due in part to study attrition. Study attrition will be addressed in the final section of the results.

Table 16

Time 2 Bivariate Correlations Between Primary Variables

Variable	1	2	3	4	5	6	7	8	9
1. Cse	–	-.37**	.38**	.17	.33*	.30*	.64**	.02	-.03
2. Freq		–	.37**	.22	.28*	.26	.37**	.19	.21
3. Struggle			–	.05	-.23	.28*	.37**	.22	.24
4. Decision				–	.29*	.25	.34*	.53**	.61**
5. Intent					–	.42*	.56**	-.11	-.10
6. Affect						–	.52**	.14	.11
7. Sse							–	.17	.07
8. Crbi								–	.85**
9. Crb									–

Note. $n = 54$. Time 2 participants were those individuals who remained in the study. The

acronyms are as follows: **Cse** = coping self-efficacy, **Freq** = overall thought frequency,

Struggle = decision struggle, **Decision** = exercise decision, **Intent** = exercise intention, **Sse** = scheduling self-efficacy, **Crbi** = coping-related behavioral intention, and **Crb** = coping-related behavior.

* $p < .05$. ** $p < .01$.

Time 2 (Postmanipulation) Hierarchical Multiple Regressions

Analysis issues. A series of hierarchical multiple regression analyses were conducted in order to investigate the hypotheses that were of interest in the current study. Similar to the Time 1 analyses, within each hierarchical regression, the predictors that were included and their order of entry were determined after theoretical and logical considerations (cf. Tabachnick & Fidell, 1996). Related to this latter consideration, the number of participants lost to study attrition at Time 2 decreased the power available to detect an effect given that the same number of predictor variables would be used in the Time 2 analyses as were used for Time 1. For example, in order to detect a medium effect size for the smallest multiple regression model that was to be examined in the current study (i.e., 4 predictors), the required sample size was 84 (see Green, 1991).

Careful consideration of strategies to increase power (Cohen, 1992; Tabachnik & Fidell, 1996) led to a multiple step solution. The first step was to determine if any covariates needed to be entered in the Time 2 hierarchical regressions. This determination was necessary due to the time-based nature of the study. Specifically, in each regression, it was important to control for any initial (i.e., Time 1) differences in the criterion in order to determine if the remaining predictors explained unique variation over and above the covariate (Tabachnik & Fidell, 1996).

Thus, in the present study, before predicting Time 2 decision struggle, exercise decision, exercise intention, and affect, a one-way between subjects MANOVA was conducted. This analysis compared the positive and the negative thinkers who returned at Time 2 on the aforementioned variables, but at Time 1. The overall MANOVA was significant, $F(4, 49) =$

3.02, Pillai's Trace = .20, $p < .03$. Subsequent univariate F -tests revealed that the negative thinkers struggled significantly more with their exercise decision prior to coping with their acute thoughts, $F(1, 52) = 11.34$, $p < .001$. No other variables significantly differed between the groups (see Table 17). Thus, decision struggle at Time 1 was the only covariate identified and used (i.e., when predicting Time 2 decision struggle).

Table 17

Comparison of the Means of Study Adherers at Time 1

Variable	Positive thinkers	Negative thinkers	p
	(M)	(M)	
Decision struggle	3.48 (2.05)	5.22 (1.67)	.001
Exercise decision	2.76 (1.36)	2.64 (1.25)	.73
Exercise intention	8.24 (1.06)	8.04 (.98)	.47
Affect	40.93 (10.20)	40.36 (10.89)	.84

Note. Standard deviations are reported in parentheses. For positive thinkers, $n = 29$. For negative thinkers, $n = 25$. Decision struggle was measured on a 1 (no struggle) to 9 (tremendous struggle) scale. Exercise decision was measured on a -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier) scale. Exercise intention was measured on a 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many) scale. Affect was measured on a 1 (don't feel at all) to 9 (feel very much) scale.

The second step that was undertaken to enhance power was to conduct two hierarchical regressions when predicting each Time 2 criterion. In the first regression, the dichotomous dummy variables of (a) type of thinker (i.e., positive or negative) and (b) message type received (i.e., high or moderate coping self-efficacy message) were entered. This was done to determine whether these variables were predictive of the criterion. Further, when Time 2 decision struggle was predicted, Time 1 decision struggle (i.e., the covariate) was entered prior to these two variables. If any of these variables contributed unique and significant variance to the criterion, they were included in the second regression in order to control for their effects.

It is also important to note that the bivariate correlations between the two dummy variables (i.e., thinker and message) and all of the Time 2 predictors were examined. As well, the bivariate correlations between the covariate, Time 1 decision struggle, and other predictors included in the prediction of Time 2 struggle (i.e., Time 2 coping and scheduling self-efficacy) were examined. The perusal of this correlational data provided additional information (e.g., multicollinearity, absence of a relationship) for the purposes of decision-making relative to model trimming and interpretation. As seen in Appendix R, the correlations were nonsignificant (i.e., p 's > .05) and ranged from -.25 to .07.

In the second regression, any significant predictors from the previous regression were entered first followed by the Time 2 predictors. Their order of entry followed the same pattern as at Time 1. However, some predictors that were included at Time 1 were excluded at Time 2. Specifically, predictors that (a) when measured at Time 1, accounted for an extremely minimal and nonsignificant amount of variance (i.e., Time 1 R^2 change's < .01, p s > .05) and (b) when measured at Time 2, exhibited no indication of being related to the criterion (i.e., low

and nonsignificant bivariate correlation) were excluded from the regression at Time 2. Taken together, these steps reduced the number of predictor variables and maintained some power to test the final regression models at Time 2 (see Green, 1991). Taking into account the exploratory nature of the current study and the recommendations of Cohen (1992), these steps to maintain power were considered appropriate.

Decision struggle. In the first multiple regression analysis, the covariate, Time 1 decision struggle, was the only significant predictor of Time 2 decision struggle (i.e., R^2 change = .25) (see Table 18). The predictors of type of thinker and type of message did not significantly contribute to the model. Thus, in the subsequent hierarchical regression analysis, the covariate was entered first, followed by Time 2 coping self-efficacy and scheduling self-efficacy. The overall model accounted for a significant amount of variance in decision struggle (R^2 adjusted = .30). Time 2 coping self-efficacy contributed significantly to the model (R^2 change = .08) after controlling for the effect of the covariate. The finding that coping rather than scheduling self-efficacy accounted for a significant amount of variance in struggle were similar to findings at Time 1.

Table 18

Prediction of Time 2 Decision Struggle

Model	Predictor	R^2 change	R^2 adjusted	p
Model 1			.21	.002
	Time 1 decision struggle	.25		.0001
	Thinker	.0001		.94
	Message	.0001		.94
Model 2			.30	.0001
	Time 1 decision struggle	.25		.0001
	Coping self-efficacy	.08		.02
	Scheduling self-efficacy	.01		.39

Note. For each hierarchical regression, $n = 54$.

Exercise decision. As seen in Table 19, type of thinker and type of message were not significant predictors of exercise decision. In the second hierarchical regression model, Time 2 coping self-efficacy was entered followed by Time 2 scheduling self-efficacy. The overall model was significant. Scheduling self-efficacy was the only significant, independent predictor (R^2 change = .09). Although this finding was in contrast to the Time 1 finding (i.e., coping was the only significant, independent predictor), it was not unexpected. Specifically, coping strategies that help one make a final decision of whether to exercise may include the ability to schedule the exercise into the day (cf. Study Two). Thus, confidence in this ability may predict the ease/difficulty of making a decision of whether to exercise (i.e., even though it may not be as correspondent with the criterion as coping self-efficacy). The finding that coping self-efficacy did not predict Time 2 exercise decision may be partly due to the selective study attrition that occurred. This attrition issue is addressed later in the results section.

Table 19

Prediction of Time 2 Exercise Decision

Model	Predictor	R^2 change	R^2 adjusted	p
Model 1			.03	.74
	Thinker	.002		.75
	Message	.009		.49
Model 2			.09	.04
	Coping self-efficacy	.03		.21
	Scheduling self-efficacy	.09		.03

Note. For each hierarchical regression, $n = 54$.

Exercise intention. In the first model, type of thinker and type of message were not significant independent predictors (see Table 20). In the second model, the order of entry was Time 2 scheduling and coping self-efficacy. The overall model was significant. However, scheduling self-efficacy was the only significant, independent predictor (R^2 change = .31). These findings were the similar to those at Time 1. At both times, large effects were observed (see Green, 1991 for conventions using R^2 as an effect size).

Table 20

Prediction of Time 2 Exercise Intention

Model	Predictor	R^2 change	R^2 adjusted	p
Model 1			.04	.93
	Thinker	.003		.71
	Message	.0001		.93
Model 2			.29	.0001
	Scheduling self-efficacy	.31		.0001
	Coping self-efficacy	.001		.74

Note. For each hierarchical regression, $n = 54$.

Affect. In the first model, type of thinker and type of message were not significant independent predictors (see Table 21). Thus, in the second model, coping self-efficacy and decision struggle were the order of predictors entered. The overall model was significant. However, coping self-efficacy was the only significant, independent predictor (R^2 change = .09: see Table 21). This finding supported the relationship advanced by self-efficacy theory (Bandura, 1997).

Table 21

Prediction of Time 2 Affect

Model	Predictor	\underline{R}^2 change	\underline{R}^2 adjusted	p
Model 1			.03	.83
	Thinker	.002		.76
	Message	.005		.60
Model 2			.08	.04
	Coping self-efficacy	.09		.03
	Decision struggle	.03		.19

Note. For each hierarchical regression, $n = 54$.

Coping-related behavioral intention. In the first model, type of thinker and type of message were not significant, independent predictors (see Table 22). In the second model, coping self-efficacy, decision struggle, and exercise decision were entered in this order. The overall model was significant. Exercise decision (R^2 change = .25) was the only significant, independent predictor. Although it may be expected that coping self-efficacy would predict this form of intention (self-efficacy theory: Bandura, 1997), study attrition and the consequent retention of equally efficacious types of thinkers may have contributed to the nonsignificant result. As mentioned previously, the issue of the effects of study attrition is discussed in a later section of the results.

Table 22

Prediction of Coping-Related Behavioral Intention

Model	Predictor	R^2 change	R^2 adjusted	p
Model 1			.04	.13
	Thinker	.009		.50
	Message	.07		.06
Model 2			.26	.001
	Coping self-efficacy	.001		.88
	Decision struggle	.05		.10
	Exercise decision	.25		.0001

Note. For each hierarchical regression, $n = 54$.

Coping-related behavior. Two logistic regressions were conducted due to the categorical nature of the behavioral variable (i.e., did or did not sign up for further information). Similar to the previous hierarchical regression, type of thinker and type of message were entered in the first regression. The test of this model against the constant-only model was not statistically reliable, $\chi^2(2, N = 54) = .95, p > .05$. In the subsequent model, the selection of predictors was based on theory (i.e., self-efficacy theory: Bandura, 1997; social cognitive theory: Bandura, 1986). Thus, coping-related behavioral intention and coping self-efficacy were the predictors. The test of this model against the constant-only model was statistically reliable, $\chi^2(2, N = 54) = 48.49, p < .00001$. Thus, the predictors, as a set, reliably distinguished between coping and no coping-related behavior. Coping-related intention was reliably associated with coping-related behavior, Wald (1) = 11.58, $p < .001$. Coping self-efficacy was not reliably associated with behavior, Wald (1) = .34, $p > .05$. Finally, the full model correctly classified 88% of the participants who did not sign up and 95% of the participants who did sign up for further information.

Time 2 (Postmanipulation) Analyses of Covariance

A series of 2 (type of thinker) X 2 (type of message) analyses of covariance (ANCOVA) were performed on the four dependent variables of coping self-efficacy, decision struggle, exercise decision, and affect. These analyses were conducted on those participants who adhered to the study at Time 2. Coping self-efficacy was examined in order to investigate the primary hypotheses of the study that were previously advanced about the different effects that the messages would have on the coping self-efficacy of the various groups. The remaining dependent variables were selected for analysis in order to explore for any additional changes

that the messages may have produced between the groups. Although the messages were designed to manipulate coping self-efficacy, changes may have occurred in these other variables because they are linked to the coping process (e.g., struggle with making a decision prior to coping with acute thoughts). Evidence of such changes would provide initial, valuable information on coping with acute, exercise-related thoughts – a topic which has received minimal attention in exercise science.

Typically, investigation of multiple dependent variables in this fashion would involve a multivariate analysis of covariance (i.e., MANCOVAR). However, a MANCOVAR was not used in the present because statistical power had been compromised by selective attrition. Specifically, the small sample size at Time 2 and the number of dependent variables would have made it difficult to detect effects (Cohen, 1992). Potentially meaningful information could be ignored if the omnibus test was not significant but a univariate test revealed an effect. Since the present research was exploratory in nature, univariate ANCOVA analyses were selected (cf. Bock, 1975). Thus, no preliminary, valuable information was overlooked. However, any significant univariate tests were interpreted with caution given the potential for Type I error associated with multiple, univariate tests.

Coping self-efficacy ANCOVA. After adjustment for the covariate (i.e., Time 1 coping self-efficacy), coping self-efficacy did not significantly vary with the main effects of the type of (a) thinker, $F(1, 49) = .52, p > .05$ and (b) message, $F(1, 49) = .97, p > .05$, or with the interaction between these two variables, $F(1, 49) = .19, p > .05$. Thus, coping self-efficacy did not significantly differ for any of the groups after reading the message (i.e., after adjusting for the covariate). See Table 23 for the adjusted means. The ANCOVA also revealed that the

covariate was significant, $F(1, 49) = 35.73, p < .0001$, indicating that the covariate provided adjustment of the dependent variable scores. The absence of main effects/interaction will be explained in a later section of the results in relation to study attrition of the sample from Time 1 to Time 2.

Table 23

Adjusted Mean Coping Self-Efficacy by Condition

Condition	Adjusted coping self-efficacy mean	
	(M)	
Positive thinker/high coping self-efficacy ^a	77.27	(3.09)
Positive thinker/moderate coping self-efficacy ^b	79.06	(3.46)
Negative thinker/high coping self-efficacy ^c	78.17	(3.75)
Negative thinker/moderate coping self-efficacy ^d	83.04	(3.36)

Note. Standard errors are reported in parentheses. The adjusted mean coping self-efficacy for the main effects were (a) thinker: positive = 78.16 (SE = 2.31); negative = 80.60 (SE = 2.49) and (b) message: high = 77.71 (SE = 2.42); moderate: 81.05 (SE = 2.38).

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Remaining ANCOVAs. The same pattern of nonsignificant main effects and interactions were observed when the dependent variables of decision struggle, exercise decision, and affect were included in an ANCOVA (see Tables 24, 25, and 26). The covariates of Time 1 decision struggle and Time 1 exercise decision were significant (see Table 24 and Table 25). The covariate of Time 1 affect was not significant (see Table 26). See Appendix S for the adjusted main effect and interaction means for each ANCOVA.

Table 24

Analysis of Covariance of Time 2 Decision Struggle

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Thinker	.04	1	.04	.02	.90
Message	.03	1	.03	.01	.91
Thinker*message	6.60	1	6.60	2.43	.13
Covariate	35.36	1	35.36	13	.001
Error	133.31	49	2.72		

Note. The covariate was Time 1 decision struggle. $n = 54$.

Table 25

Analysis of Covariance of Time 2 Exercise Decision

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Thinker	.0009	1	.0009	.0001	.99
Message	2.53	1	2.53	2.06	.16
Thinker*message	.36	1	.36	.29	.59
Covariate	14.8	1	14.8	12.04	.001
Error	60.26	49	1.23		

Note. The covariate was Time 1 exercise decision. $n = 54$.

Table 26

Analysis of Covariance of Time 2 Affect

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Thinker	22.47	1	22.47	.14	.71
Message	56.62	1	56.62	.35	.56
Thinker*message	108.4	1	108.4	.67	.42
Covariate	2.06	1	2.06	.01	.91
Error	7909.35	49	161.42		

Note. The covariate was Time 1 affect. n = 54.

Taken together, the nonsignificant results indicate that the messages had no differential impact on any of the coping-related variables. An initial conclusion may be that the messages were not effective. However, the impact of a large, selective attrition that occurred in the sample of negative thinkers resulted in a reduction of their numbers at Time 2. This may, in part, help to explain the failure of the manipulation to work as hypothesized.

Study Attrition Analyses

In many time-based field studies or experiments, one uncontrolled phenomenon that may occur is study attrition. In all cases, study attrition raises the possibility that selective effects (i.e., either significant or nonsignificant) and/or artifactual effects may occur. Furthermore, in intervention studies, study attrition raises the possibility that the initial randomization of participants to treatment groups is compromised. Clearly, these possible issues make it prudent to conduct a thorough analysis of those participants who declined to complete the study. The results of this analysis may assist the interpretation of study results.

In the present study, such an analysis was warranted due to the high attrition rate in the negative thinkers. Recall from Table 8 that at Time 2, 43% of the negative thinkers dropped out of the study. In the high message condition, 45% or nine of the original 20 participants were lost and, in the moderate message condition, 42% or 10 of the original 24 were lost. The number of positive thinkers who dropped out in the high message condition was 5% or one of the original 17 and, in the moderate message condition, 13% or two of the original 15. Thus, attrition selectively reduced the number of negative thinkers in the sample.

Descriptives and analyses of specific Time 1 variables for adherers and dropouts in the positive and the negative groups are presented in the next section. This section illustrates that

the negative thinkers who had the greatest room for change (i.e., improvement in postmanipulation coping self-efficacy) were lost to the study. The next section contains descriptives and analyses of specific Time 1 and Time 2 variables for study adherers in each condition (i.e., type of thinker X type of message). This section suggests that one reason for the failure of the high message to produce the hypothesized increase in the coping self-efficacy of negative thinkers was that the negative study adherers were very efficacious in their coping abilities at Time 1. Thus, at Time 2, there was little room for enhancement of their coping-self-efficacy beliefs.

Descriptive and analyses of time 1 variables within positive and negative groups. Table 27 contains the means and standard deviations of the primary variables. The data suggest that negative thinkers who dropped out had more frequent negative thoughts and lower coping self-efficacy, exercise intention, and scheduling self-efficacy than negative thinkers who adhered to the study. In order to determine if these differences were significant, a one-way between groups MANOVA was conducted. The independent variable was type of negative thinker (i.e., adherer, dropout) and the dependent variables were Time 1 thought frequency, coping self-efficacy, exercise intention, and scheduling self-efficacy.

The overall model was significant, $F(4, 42) = 5.24$, Pillai's Trace = .35, $p < .002$. Subsequent univariate F -tests revealed that the negative dropouts had significantly (a) more negative thoughts, $F(1, 42) = 4.80$, $p < .04$, and (b) lower exercise intention, $F(1, 42) = 5.45$, $p < .02$, compared to negative adherers. Although the trend was for the negative dropouts to have lower coping and scheduling self-efficacy compared to negative adherers, the differences were not significant (i.e., for coping self-efficacy: $F(1, 42) = 2.11$, $p > .15$; for scheduling self-

efficacy: $F(1, 42) = .47, p > .50$) possibly due, in part, to the lower power of the analysis.

In sum, the MANOVA revealed that negative thinkers with the most extreme frequency of negative thoughts and with a lower exercise intention were lost to study attrition.

Furthermore, these negative thinkers had a lower, although not significantly lower, degree of coping and scheduling self-efficacy. This suggests that negative thinkers who had the most room for change in postmanipulation coping self-efficacy were lost from the manipulation.

Due to the low number of positive dropouts ($n = 3$), it was difficult to make any conclusive statements about differences compared to positive adherers (see Table 27 for means and standard deviations of primary variables).

Table 27

Primary Variable Descriptives for Negative and Positive Dropouts and Adherers

Time 1 Variable	Negative thinkers		Positive thinkers	
	Dropouts (<u>n</u> = 19)	Adherers (<u>n</u> = 25)	Dropouts (<u>n</u> = 3)	Adherers (<u>n</u> = 29)
Thought frequency	-9.16 (5.97)	-5.80 (4.20)	6.67 (3.79)	6.24 (3.25)
Coping self-efficacy	63.94 (19.41)	73.35 (22.51)	85.83 (5.20)	76.72 (16.36)
Exercise intention	7.11 (1.66)	8.04 (.98)	8.00 (0)	8.24 (1.06)
Scheduling self-efficacy	76.12 (16.01)	80.19 (21.62)	90.00 (5.45)	81.74 (18.71)

Note. Standard deviations are reported in parentheses. Coping and scheduling self-efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale. Exercise intention was measured on a 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many) scale.

table continues

Table 27

Primary Variable Descriptives for Negative and Positive Dropouts and Adherers

Time 1 Variable	Negative thinkers		Positive thinkers	
	Dropouts (<u>n</u> = 19)	Adherers (<u>n</u> = 25)	Dropouts (<u>n</u> = 3)	Adherers (<u>n</u> = 29)
Decision struggle	5.26 (1.37)	5.22 (1.67)	3.33 (1.53)	3.48 (2.05)
Exercise decision	2.72 (1.04)	2.64 (1.25)	2.33 (1.53)	2.76 (1.36)
Affect	39.26 (10.73)	40.36 (10.89)	40.67 (2.08)	40.93 (10.20)

Note. Standard deviations are reported in parentheses. Decision struggle was measured on a 1 (no struggle) to 9 (tremendous struggle) scale. Exercise decision was measured on a -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier) scale. Affect was measured on a 1 (don't feel at all) to 9 (feel very much) scale.

Descriptives and analyses of variables between thinker by message conditions. Recall that one of the primary purposes of the study was to examine whether coping self-efficacy could be influenced by a hypothesized determinant of self-efficacy (i.e., persuasive message). Also, recall that the 2 (type of thinker) X 2 (type of message) ANCOVA revealed that postmanipulation coping self-efficacy did not significantly increase in any condition of the study. Consideration of the mean coping self-efficacy in study adherers at Time 1 and at Time 2 in each condition of the study provided some interesting details that may help explain the lack of a significant effect.

As seen in Table 28, at Time 1, positive thinkers in the high or moderate coping self-efficacy message conditions were fairly confident in their coping abilities. Negative thinkers in the high coping self-efficacy condition were also fairly confident in their coping abilities. Recall that coping self-efficacy in this group was hypothesized to change the most after message exposure. However, given the high coping self-efficacy that these people possessed going into the manipulation, it was very difficult to enhance their coping self-efficacy.

It is important to note that the other group of negative thinkers (i.e., who received the moderate message) had fairly moderate confidence in their coping abilities at Time 1. Furthermore, after message exposure (i.e., Time 2), their coping self-efficacy increased to a level that was similar to the remaining groups. A within-subjects t -test for this group revealed a trend for their coping self-efficacy to change in the hypothesized direction, $t(13) = -2.00$, $p > .07$ (see Table 28 for the means). Although not significant, this suggests even a moderate coping self-efficacy message may have an impact on people with room for efficacy to increase (i.e., not at high levels of coping self-efficacy). Future investigations should be conducted in

order to provide evidence that supports or refutes this suggestion.

Table 28

Coping Self-Efficacy in Study Adherers

Condition	Time 1 CSE	Time 2 CSE
	(M)	(M)
Positive thinker/high message ^a	73.44 (18.77)	76.33 (21.35)
Positive thinker/moderate message ^b	80.77 (12.34)	82.12 (10.30)
Negative thinker/high message ^c	80.34 (15.57)	80.98 (12.70)
Negative thinker/moderate message ^d	67.86 (25.97)	79.06 (15.58)

Note. Standard deviations are reported in parentheses. Coping self-efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale. **CSE** = coping self-efficacy.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

The descriptive statistics for the remaining variables of primary interest (i.e., decision struggle, exercise decision, exercise intention, affect, and scheduling self-efficacy) were examined for changes within the groups (i.e., type of thinker X type of message) of study adherers at Time 1 and Time 2. Interestingly, affect increased a great deal in all groups after message exposure (see Table 29). A repeated measures analyses of variance (i.e., on affect) was conducted to determine if these increases were significant. The factors in the analysis were type of thinker (i.e., positive, negative) and type of message (i.e., high, moderate). As expected, affect significantly increased over time within all groups, $F(1, 50) = 117.47, p < .0001$. There were no significant main effects of type of thinker, $F(1, 50) = .01, p > .05$, and type of message, $F(1, 50) = .008, p > .05$, nor was there a significant interaction of thinker by message, $F(1, 50) = .49, p > .05$.

This finding addresses the effectiveness of the control measure employed in the messages. Recall that both messages were designed to control for positive outcome expectations, and, as a result, all messages were very positive in nature while varying the difficulty of utilizing coping strategies. Thus, the increases in affect suggest that the control was successful.

The similar values for the remaining primary variables within groups of adherers at Time 1 and Time 2 were not surprising for a variety of reasons (see Appendix T for the means and standard deviations at Time 1 and at Time 2). First, some variables (i.e., exercise intention and scheduling self-efficacy) did not directly pertain to the coping process and thus, would not be expected to change after exposure to the coping-related messages within any group. Second, although some variables (i.e., decision struggle and exercise decision) may be linked

to the coping process, they were not directly targeted for change by the messages.

Table 29

Affect in Study Adherers

Condition	Time 1 affect	Time 2 affect
	(M)	(M)
Positive thinker/high message ^a	39.68 (8.44)	63.94 (13.72)
Positive thinker/moderate message ^b	42.46 (12.22)	64.77 (14.24)
Negative thinker/high message ^c	39.18 (7.64)	68.09 (7.64)
Negative thinker/moderate message ^d	41.29 (13.11)	63.19 (12.63)

Note. Standard deviations are reported in parentheses. Affect was measured on a 1 (don't feel at all) to 9 (feel very much) scale.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Summary. The manipulation may not have produced the hypothesized effects on coping self-efficacy for two reasons. First, negative thinkers who would have gained the greatest benefit and who were most susceptible to change (i.e., low coping self-efficacy) dropped out. Second, negative adherers exposed to the high message had high levels of coping self-efficacy at Time 1 and a potential ceiling effect may have occurred. However, it is encouraging to note that for negative thinkers with somewhat moderate levels of coping self-efficacy, a moderate message showed some indication of being able to enhance coping self-efficacy in the predicted direction (see Table 28). It is also encouraging to note that the high and moderate efficacy messages enhanced positive affect in all groups of participants. This increases the likelihood that participants can be persuaded to employ coping strategies because there exists a high incentive to do so (self-efficacy theory: Bandura, 1997).

One final result that is related to message exposure revolves around participants' coping-related behavior. Recall that after reading the message, 19 positive and 18 negative thinkers ($n = 37$) chose to engage in the behavior. In contrast, 10 positive and seven negative thinkers ($n = 17$) chose not to engage in the behavior. An interesting question that arises is whether any measured variables were concurrently related to participants' choice to partake in learning coping-related actions. For example, do individuals who (a) have more acute, negative thoughts, (b) have a lower coping self-efficacy, (c) experience a greater decision struggle prior to coping with their acute thoughts, and/or (d) perceive that the ease/difficulty of deciding whether to exercise is influenced by the use of coping strategies choose to learn more about coping?

The means and standard deviations of the variables for people who chose to engage in

or not engage in learning about coping are contained in Table 30. A one-way between subjects MANOVA was conducted to examine differences between those who chose and those who chose not to learn about coping. Choice of behavior (i.e., chose or did not choose) was the independent variable and thought frequency, decision struggle, coping self-efficacy, and exercise decision were the dependent variables. The overall MANOVA was significant, $F(4, 49) = 9.88$, Pillai's Trace = .45, $p < .0001$. Subsequent univariate F -tests revealed that the individuals who chose to participate had significantly (a) less negative thoughts, $F(1, 52) = 2.29$, $p < .04$, and (b) perceived that the use of their coping strategies would result in reaching a significantly easier exercise decision, $F(1, 52) = 30.20$, $p < .0001$, than individuals who chose not to participate. Although the means were in the expected direction where the former group experienced a greater struggle than the latter group in deciding whether to exercise prior to coping with acute thoughts, this difference was not significant, $F(1, 52) = 3.21$, $p > .06$. Coping self-efficacy did not significantly differ between groups, $F(1, 52) = .03$, $p > .86$.

In sum, it is not surprising that individuals who perceived that their decision of whether to exercise was made easier after exerting coping efforts and who gave some indication of a greater struggle with their decision in the face of acute thoughts also chose to learn more about how to use their tools. In contrast, it was somewhat surprising that people with more acute, negative thoughts did not choose to learn more about coping with them. However, consideration of their coping self-efficacy may explain this finding. That is, these people were also very confident in their coping abilities.

Table 30

Mean Comparisons: People who Chose or Chose Not to Learn About Coping

Variable	Chose to learn ^a	Chose not to learn ^b
	(M)	(M)
Thought frequency	-1.33 (6.40)	-4.18 (6.49)
Decision struggle	4.51 (1.89)	3.55 (1.71)
Coping self-efficacy	79.11 (15.27)	79.96 (17.22)
Exercise decision	3.14 (.82)	1.56 (1.25)

Note. Standard deviations are reported in parentheses. Decision struggle was measured on a 1 (no struggle) to 9 (tremendous struggle) scale. Coping self-efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale. Exercise decision was measured on a -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier) scale.

^an = 37. ^bn = 17.

Discussion

One purpose of the current study was to determine if coping self-efficacy predicted a number of variables associated with the process of decision-making, intention, behavior, and affect both before and after reading a persuasive message. The social cognitive variables associated with the decision-making process were (a) the struggle, or the cognitive rumination and effort, that individuals experienced when considering whether to exercise prior to exerting efforts to cope with their acute thoughts (i.e., called decision struggle) and (b) the overall ease/difficulty of making a decision of whether to exercise after exerting coping efforts (i.e., called exercise decision). A second purpose was to determine if a persuasive message (i.e., a determinant of efficacy) could alter exercisers' coping self-efficacy.

Relationship Between Coping Self-Efficacy and the Primary Variables

Coping self-efficacy and decision struggle. Examination of the relationship between coping self-efficacy and decision struggle revealed a consistent finding. Specifically, coping self-efficacy contributed unique variance to the prediction of decision struggle at Time 1 (i.e., premessage: before individuals were exposed to the message) and at Time 2 (i.e., postmessage: after individuals were exposed to the message). These findings support study hypotheses. It is important to note that at Time 1, type of thinker, also predicted struggle. At Time 2, the covariate of premessage struggle also contributed unique variance to the prediction of postmessage struggle.

These findings suggest that coping self-efficacy is related to the ruminative tug-of-war that relatively inexperienced exercisers have prior to exerting efforts to cope with their acute thoughts. These findings are also in agreement with self-efficacy theory (Bandura, 1997)

which suggests that individuals who are efficacious in their coping abilities are not as perturbed by negative thoughts. Thus, even before exerting coping efforts, these individuals should not struggle, or ruminate, as much about whether to exercise compared to less efficacious individuals.

Although no specific hypotheses about the prediction of struggle by type of thinker were advanced in the current study, the finding can be understood. Specifically, individuals experience acute thoughts when they are deciding whether to exercise as planned. They consciously consider the benefits (e.g., positive, acute thoughts) and the costs (e.g., negative, acute thoughts) of exercising (Maddux et al., 1995). Thus, acute thoughts may provoke differential effort for positive versus negative thinkers where negative thinkers cognitively work harder in relation to their decision-making. Recall that preliminary evidence of this increased struggle was revealed through the multivariate analysis at Time 1. Negative thinkers struggled significantly more compared to positive thinkers. However, because evidence of the relationship between type of thinker and struggle was provided at Time 1 but not at Time 2, continued examination is warranted to determine the reliability of this relationship.

Finally, the finding that Time 1 struggle predicted Time 2 struggle provided preliminary evidence that struggle may be influential over time. This finding underscores the necessity and the benefit of an intervention to decrease the struggle that individuals expect to have in the face of acute thoughts. As previously outlined, one way to do so may be to enhance coping self-efficacy. The utility of such an intervention may be twofold. First, enhancing coping self-efficacy may decrease struggle. Second, this decrease in struggle may decrease the perceived future struggle that one expects to have after experiencing acute thoughts.

Coping self-efficacy and exercise decision. Examination of the relationship between coping self-efficacy and exercise decision revealed two basic findings. First, at Time 1, coping self-efficacy accounted for a significant amount of variance in the prediction of exercise decision. Second, at Time 2, this result was not found. Rather, scheduling self-efficacy accounted for a significant amount of variance in the prediction of exercise decision.

The significant prediction of decision by coping self-efficacy at Time 1 supported study hypotheses. Consistent with the tenets of self-efficacy theory (Bandura, 1997), individuals who are efficacious in their abilities to cope with acute thoughts (i.e., that arise when deciding whether to exercise) should perceive that the use of their coping strategies influences the ease of their decision of whether to exercise (self-efficacy theory: Bandura, 1997). However, the question arises as to why this finding was not consistent at Time 2.

A suggested explanation may lie with the characteristics of the participants who adhered to the study at Time 2. First, for these individuals, coping self-efficacy at Time 2 was higher (i.e., a possible ceiling effect) and less variable than at Time 1. The lower coping self-efficacy variability at Time 2 may not have correlated with the greater variability in Time 2 exercise decision. Second, at Time 2, exercise decision was significantly and positively related to exercise intention. This association may have evolved from the participants' previous two weeks of regular adherence such that the easier that the decision was to make, the more they also intended to exercise. If this was the case, then it is not surprising that scheduling self-efficacy, which was a significant predictor of exercise intention, also predicted exercise decision.

Coping self-efficacy and exercise intention. Examination of the relationship between

coping self-efficacy and exercise intention yielded one general finding. Specifically, although coping self-efficacy was positively correlated with exercise intention at Time 1 and at Time 2, when it was combined with scheduling self-efficacy in a model to predict intention, it did not contribute unique variance at either time period. Rather, scheduling self-efficacy predicted intention at both time periods. This result was most likely due to the better correspondence between scheduling self-efficacy and intention than between coping self-efficacy and intention. The importance of correspondence when the research goal is prediction has been emphasized by McAuley and Mihalko (1998).

It was expected that coping self-efficacy would be correlated with exercise intention. This finding is similar to the results of previous exercise research (see McAuley & Mihalko, 1998 for a review) and supports hypotheses advanced by self-efficacy theory (Bandura, 1997). Specifically, this theory hypothesizes that the more efficacious that individuals are in their abilities, the more they will intend to behave.

However, existence of a positive association does not always result in prediction of intention. Prediction also depends, in part, on the correspondence between the predictor and the criterion. Clearly, scheduling self-efficacy, which encompasses beliefs about specific behavioral abilities, is more correspondent with exercise intention (i.e., intention to perform a behavior) than is coping self-efficacy (i.e., beliefs about coping abilities).

Coping self-efficacy and affect. One general finding was revealed about the relationship between coping self-efficacy and affect experienced after exerting coping efforts. Specifically, coping self-efficacy accounted for a significant amount of variance in the prediction of affect at Time 2 but not at Time 1. The finding at Time 2 of a significant

relationship between coping self-efficacy and affect provided partial support for study hypotheses. This finding is also supportive of hypotheses advanced by self-efficacy theory (Bandura, 1997). This theory hypothesizes that individuals who are efficacious in their coping abilities focus their efforts on adopting strategies to deal with a demand (e.g., acute thoughts). Consequently, they do not distress themselves over the impending negative impact of the demand. Thus, as coping self-efficacy increases, affect increases. Finally, this result adds to those of Ozer and Bandura (1990) who also found a relationship between coping self-efficacy and one specific type of affect (i.e., anxiety).

The finding that coping self-efficacy did not predict affect at Time 1 may have been due to the variability of coping self-efficacy and affect. At Time 1, participants were fairly confident but variable in their abilities to cope. They also experienced a moderate and less variable affect postcoping. The coping self-efficacy variability may not have correlated with the lower variability in affect. In contrast, at Time 2, coping self-efficacy and affect were both quite high and somewhat variable. These increases in affect may have been due, in part, to the messages which consistently emphasized that coping with thoughts would result in positive outcomes, and thus, positive affect. Even though affect increased significantly in study adherers after message exposure, the greater variability in affect suggests that the change was somewhat erratic. This pattern of variability correlated well with the variability in coping self-efficacy.

Coping self-efficacy and coping-related behavioral intention. Neither coping self-efficacy nor struggle predicted coping-related intention. In contrast, exercise decision explained significant and unique variance in this form of intention. Consideration of study

adherers may help to explain these findings. Specifically, after message exposure, coping self-efficacy did not significantly increase and struggle did not significantly decrease in any of the groups of study adherers. However, all of these groups indicated that the use of their coping strategies would influence their decision of whether to exercise. This suggests that although the messages were not effective in changing coping self-efficacy and reducing struggle, participants continued to perceive merit to using their coping strategies. Consequently, they also intended to learn more about coping with negative thoughts.

Coping self-efficacy and coping-related behavior. Contrary to the study hypothesis, coping self-efficacy was not reliably associated with coping-related behavior (i.e., read a pamphlet; attend a workshop). However, coping-related behavioral intention was reliably associated with this behavior. This latter finding is supportive of hypotheses advanced in various social cognitive theories (e.g., theory of planned behavior: see Godin & Kok, 1996 for a review; social cognitive theory: Bandura, 1986). In hindsight, the hypothesis that coping self-efficacy would predict this type of behavior may have been incorrect. Coping self-efficacy is concerned with beliefs in abilities to cope with negative thoughts so that one can go to planned exercise. Coping-related behavior is concerned with learning this particular skill. Clearly, these two variables are concerned with different domains of coping-related functioning. As such, it is not surprising that coping self-efficacy did not predict coping-related behavior.

Distinctiveness of Coping Self-Efficacy

The current study provided preliminary evidence of the distinctiveness of the coping self-efficacy construct in the exercise domain. First, divergent validity of coping self-efficacy was observed. Specifically, coping self-efficacy was modestly correlated with scheduling self-

efficacy. Second, the general pattern in the hierarchical regressions was for coping and scheduling self-efficacy to explain unique variation in dependent variables that were most correspondent with the efficacy type. For example, coping self-efficacy predicted struggle and scheduling self-efficacy predicted exercise intention at Time 1 and at Time 2. This suggests that future investigations should attend to the correspondence between self-efficacy predictors and criteria (cf. Bandura, 1997; McAuley & Mihalko, 1998). In relation to coping self-efficacy, this suggests that the main criteria of interest should be related to the decision-making process of whether to exercise as planned. It is during this time that acute, exercise thoughts are experienced. For negative thoughts, it is also during this time that coping strategies must be employed and thus, coping self-efficacy should come into play.

Differences Between Negative and Positive Thinkers

Insight into the role that acute negative and positive thoughts had on social cognitive variables was gained through extreme group comparisons. Recall that negative thinkers (i.e., a higher frequency of negative than positive, acute thoughts) were compared to positive thinkers (i.e., a higher frequency of positive than negative, acute thoughts). The negative thinkers experienced significantly more of a decision struggle and had a significantly lower exercise intention than the positive thinkers. Further, the means for coping self-efficacy were in the expected direction with negative thinkers having lower coping self-efficacy than positive thinkers. Exercise decision and affect were not significantly different between groups.

The difference in decision struggle between type of thinkers can be explained by consideration of when individuals experience acute thoughts. Such thoughts are experienced on a daily or a weekly basis when individuals are deciding to exercise. Those individuals who

have many acute, negative thoughts should struggle more with their decisions of whether to exercise (i.e., prior to coping) than individuals who have many acute, positive thoughts. Further, since the former individuals have many negative thoughts about exercising as planned, it is not surprising that they also have a lower exercise intention than their positive counterparts.

This latter finding is in contrast to the finding reported in Study One. Recall that no significant differences in exercise intention existed between negative and positive thinkers. However, participants in Study One were exercisers who had been adhering to their exercise program for seven weeks. Thus, they were highly motivated with strong intentions to continue exercising, regardless of their acute thoughts (i.e., positive or negative). In contrast, participants in Study Three were inconsistent or beginner exercisers. These exercisers may not have experienced sufficient coping mastery to regularly negate any detrimental impact of acute, negative thoughts on exercise intention. For these exercisers, a future investigation should examine if the relationship between type of acute thinking (i.e., positive or negative) and intention they exhibited as beginner or inconsistent exercisers would change after continued adherence.

The finding of a trend for coping self-efficacy to be lower in negative thinkers compared to positive thinkers is similar to that observed in Study One. In that study, negative thinkers had a significantly lower attendance self-efficacy compared to positive thinkers. Taken together, these two findings suggest that the overall type of acute thoughts that people experience may influence a broad variety of efficacy beliefs (i.e., behavioral and coping) that are important for motivated exercise behavior.

In the current study, there were no differences in exercise decision and affect for negative and positive thinkers. However, all participants were motivated to exercise at the time of assessment. Consequently, they may not have reflected differences in all aspects of social cognitions and affect as might be hypothesized for a comparison between exercise adherers and dropouts. However appealing this suggestion may be, it requires a test through a future investigation.

Manipulation of Coping Self-Efficacy

The current study revealed that the high coping self-efficacy message and the moderate coping self-efficacy message were not effective in altering coping self-efficacy in positive and negative thinkers. Recall that it was hypothesized that negative thinkers exposed to the high self-efficacy message would experience the greatest increase in coping self-efficacy. Self-efficacy was also expected to (a) increase to a lesser extent in negative thinkers exposed to the moderate self-efficacy message and (b) minimally or not change in positive thinkers exposed to either message. Does this lack of support for the study hypotheses suggest that the use of verbally persuasive techniques to manipulate coping self-efficacy be abandoned?

The answer to this question is no. Specifically, investigation of study dropouts and adherers (a) provided some insight into the reason that the efficacy manipulation did not work as expected and (b) showed a small indication that verbal persuasion may have produced some impact. In relation to the first point, examination of study dropouts revealed that the major attrition occurred by negative thinkers. Further, these negative thinkers were significantly more negative in their thinking (i.e., more negative thoughts) and had a lower (although not significantly) coping self-efficacy compared to negative thinkers who adhered to the study.

Thus, individuals who may have been most susceptible to change via the manipulation were lost to the study.

Related to this latter point was the observation that negative thinkers who adhered to the study and who were exposed to the high efficacy message had high levels of coping self-efficacy going into the manipulation. These individuals had little room for efficacy enhancement. Thus, the loss of select negative thinkers combined with the high efficacy of negative adherers combine to help explain why the hypothesized increase in coping self-efficacy were not observed after exposure to the high efficacy message.

In examining the use of verbal persuasion, a specific post hoc examination of negative study adherers exposed to the moderate message gave some indication that the message enhanced their coping self-efficacy. Specifically, negative thinkers who adhered to the study had a moderate degree of coping self-efficacy at Time 1 compared to other study adherers. After message exposure, their coping self-efficacy increased to a level that was similar to all of the other groups in the study. Since a moderate message was able to enhance efficacy in this negative thinking and less confident group to a certain extent, it follows that a high coping self-efficacy message may have produced a greater effect in this group. However, this statement is speculative and requires a study which also includes sufficient incentive to keep targeted individuals (i.e., low coping self-efficacy) in the study. Under such conditions, the impact that a high and a moderate coping self-efficacy message has on coping self-efficacy may receive an unbiased test.

An alternative argument that might be advanced to explain the failure of the message manipulation may be that the quality of the messages and thus, the abilities of the messages to

assist in persuasion was poor. However, positive and negative thinkers indicated a high agreement that the messages contained qualities presumed to assist in persuasion (i.e., informational, aimed at me, easy to read and understand, and accurate information) (Bandura, 1997; Kopfman et al., 1998). Thus, the quality of the messages and their applicability to participants was perceived as being generally good. With respect to message believability, all groups indicated an above average level of believability (i.e., a minimum mean value of six on a nine-point scale). However, the positive/moderate group indicated an even higher level of believability (i.e., a mean value of eight). It could be presumed that because individuals in this group perceived that the message had very high believability that the moderate message should have exerted an effect on their coping self-efficacy. Recall that no overall effect was observed. In contrast, the trend towards an effect was observed in the negative thinkers exposed to the moderate message – a group who indicated a level of believability of seven. Thus, observed differences in generally high message believability could not have accounted for the observed trend.

Unexpected Reactions to the Persuasive Message

It would be remiss not to address one seemingly peculiar finding in the current study. Recall that participants who were classified as positive thinkers at Time 1 reported a higher frequency of negative than positive thoughts at Time 2. In other words, these previously positive thinkers reported more negative thoughts after message exposure. Interestingly, their acute, negative thinking pattern at Time 2 was not associated with corresponding changes in coping self-efficacy (i.e., decrease), decision struggle (i.e., increase) and exercise decision. As well, affect in this group was significantly higher at Time 2 (as it was for all study adherers).

Taken together, this suggests that the positive thinkers did not become truly negative in their acute thinking about exercise (i.e. if so, changes in at least some of these other variables should have been observed).

Rather, the positive thinkers may have experienced a transitory shift in their acute thinking due to message exposure. Recall that both messages addressed the issue of coping with negative thoughts. Numerous examples of negative thoughts were also included in the messages. These two message characteristics may have made negative thoughts most available in the consciousness of positive thinkers. This would not have been the case for negative thinkers who already had negative thoughts most available. Although this explanation is speculative, it suggests that in future studies it may be appropriate to (a) assess individuals over time in order to examine if message effects are transitory or more long-lasting and (b) use a control group in addition to a message exposure group. If no change occurred in the control group, then responsibility for change would be placed upon message exposure.

Strengths, Limitations, and Caveats

Findings from the current study have added to the literature on coping with acute, negative, exercise-related thoughts. Recall that results from Study One and Kendzierski and Johnson's (1993) study showed that exercisers experience acute, negative thoughts. Also, recall that Study Two showed that exercisers perceived some benefit to coping with their acute, negative thoughts. One strength of the current study is the preliminary evidence that individuals' confidence in their abilities to execute coping strategies (i.e., coping self-efficacy) is an important part of the coping process. A second strength is that this study is the first in the exercise literature to show that coping self-efficacy is predictive of social cognitive aspects of

the decision-making process (i.e., struggle and decision) – a process that has received little attention even though it may be important for exercise adherence. Further, this study provided initial evidence of the predictive validity of the coping self-efficacy construct as hypothesized by self-efficacy theory (Bandura, 1997). A final strength of the study was the random assignment of positive and negative thinkers to the message conditions which potentially allowed for a controlled test of an attempt to manipulate coping self-efficacy.

Despite these strengths, consideration of study limitations places the findings into perspective. One obvious limitation is that the high rate of study attrition by negative thinkers made it difficult for the manipulation to produce the hypothesized effects. Thus, at this time, it is not known if a verbally persuasive message is effective in increasing coping self-efficacy in those individuals who are in most need (i.e., low coping self-efficacy). A second limitation is that due to study attrition and the consequent reduction in the number of participants remaining at Time 2, it was difficult to have the necessary power to detect effects in some of the analyses (cf. Cohen, 1992; Green, 1991).

One caveat involves the conceptual distinctiveness and measurement of the decision-making variables assessed in the current study. The one-item measure of decision struggle was an attempt to assess the degree of struggle, or cognitive rumination and effort, associated with the individual's consideration of whether to exercise prior to exerting coping attempts. In contrast, the one-item measure of exercise decision was an attempt to assess the influence that the use of coping strategies had on the ease/difficulty of deciding whether to exercise (i.e., after coping). Although the low correlations found in the current study provided preliminary evidence that these two constructs are distinct social cognitive facets of the decision-making

process (i.e., $r < .20$), future research is required to determine the reliability of this finding. Further, it is not known at the present time if the single-item measures of decision struggle and exercise decision fully represent the two constructs. Thus, future use of participants as active agents in the determination of whether single-item gestalt measures or whether multi-item measures most adequately and reliably represent struggle and exercise decision would be a desirable and necessary research step.

Future Directions

One suggestion for future research is to expose exercisers to the same types of messages as in the current study (i.e., a high or a moderate coping self-efficacy message) but ensure that study attrition does not occur or is kept at a minimal level. One way to do this would be to offer a stronger incentive than what was offered in the current study. For example, one type of strong incentive may be the receipt of a sum of cash or participant-valued prizes for study adherence. Maintaining participants would result in a more powerful test of the use of these types of persuasive messages in altering coping self-efficacy. A second future direction is to examine whether other types of self-efficacy determinants alter coping self-efficacy. For example, a mastery-based intervention may enhance efficacy to even higher levels that are sustained for a longer period of time compared to a persuasive communication intervention (cf. self-efficacy theory: Bandura, 1997). A third future direction is to include both coping self-efficacy (i.e., confidence in abilities to execute coping strategies) and coping response efficacy (i.e., beliefs in the effectiveness of coping strategies) in an investigation. Doing so would provide insight on which type of belief is most influential of social cognitive and behavioral outcomes. Fourth, continued examination of the decision struggle and exercise decision

constructs and measures is needed in order to better understand the role that these two social cognitions play in the decision-making process.

General Discussion

When examining the problem of exercise nonadherence, a great deal of research has focused on the influence of relatively stable beliefs (e.g., attitudes, perceived control) as determinants of future intentions and behavior. In contrast, little research has focused on the more acute or day-to-day thoughts that result as a function of making decisions about whether to exercise. These types of thoughts are important to examine because they may not only be precursors to stable beliefs but they may also immediately impact upon whether an individual exercises as planned. Thus, using self-efficacy theory (Bandura, 1997) as a foundation, the overriding objectives of the series of studies in the current dissertation were to investigate (a) the influence of acute negative and positive thoughts as they impact on decisions to exercise, (b) the process involved in coping with negative thoughts, and (c) the impact of coping-related social cognitions on decision-making, intention, and behavior.

Preliminary evidence of the importance of acute thoughts in the exercise domain was provided by Kendzierski and Johnson (1993). They found that the frequency of acute, negative thoughts of college students was negatively correlated with their exercise intention and self-reported behavior. However, it has been suggested that when individuals make exercise decisions, they consciously consider both the cons (e.g., acute negative thoughts) and the pros (e.g., acute, positive thoughts) of exercising (Maddux et al., 1995). Social cognitive theory (Bandura, 1986) also suggests that the combined influence (i.e., frequency and overall tone) of these thoughts operate to influence motivated behavior. This raises the possibility that exercisers experience both acute, positive thoughts and acute negative thoughts, which were previously identified (i.e., Kendzierski & Johnson, 1993), as a function of deciding whether to exercise.

Furthermore, social cognitive and self-efficacy theories (Bandura, 1986; 1997) suggest that the influence of thoughts on motivated behavior is not direct. Rather, thoughts influence self-efficacy beliefs. In turn, self-efficacy beliefs influence intention and behavior.

The studies in this dissertation represent a first attempt to explore the influences mentioned above. In general, the results of these studies support contentions from self-efficacy theory (Bandura, 1997) that forethought, in this case, daily, acute forethought, is predictive of motivated exercise behavior. The results also support contentions from this theory that beliefs in the effectiveness of coping strategies (i.e., coping response efficacy) and beliefs in abilities to execute coping strategies (i.e., coping self-efficacy) play important roles in the process of coping with acute, negative thoughts.

In Study One, it was found that exercise adherers experienced a multitude of acute negative and positive thoughts as a function of deciding whether to exercise. Furthermore, the total frequency of these acute thoughts (i.e., total positive thoughts minus total negative thoughts) predicted a behavioral form of self-efficacy (i.e., attend planned exercise). This form of self-efficacy predicted exercise intention and behavior. Furthermore, differences between exercisers classified as negative thinkers (i.e., more total negative than positive thoughts) and positive thinkers (i.e., more total positive than negative thoughts) were found for self-efficacy and behavior. Specifically, negative thinkers had significantly lower self-efficacy and exercise attendance compared to positive thinkers.

Considered together, the findings from Study One indicated that the influence of acute, exercise-related thoughts is a phenomenon worthy of further study which may add to the understanding of motivated exercise behavior. These findings also supported previous

suggestions that individuals consider both the pros (e.g., acute positive thoughts) and the cons (e.g., acute negative thoughts) of a behavior when making a behavioral decision and that these thoughts combine to influence motivated behavior (Maddux et al., 1995; social cognitive theory: Bandura, 1986). Although the predictions in this study were based on concurrent data, the findings are supportive of the indirect relationship between thoughts and intention and between thoughts and behavior (self-efficacy theory: Bandura, 1997). The finding that self-efficacy was positively associated with exercise intention and behavior supports hypotheses advanced by self-efficacy theory (Bandura, 1986). Specifically, individuals who are efficacious in specific skills and abilities related to behavioral performance are more likely to perform the behavior compared to inefficacious individuals.

Interestingly, although negative thinkers in Study One exercised significantly less than their positive counterparts, they still managed to adhere to their exercise program at a fairly high rate (i.e., 73% attendance rate). This finding raised the possibility that the negative thinkers had developed effective strategies to cope with their acute, negative thoughts. Study Two was undertaken to investigate this coping process. Specifically, this study investigated (a) the strategies that exercise adherers employed in their attempts to cope with their acute, negative thoughts, (b) their beliefs in the effectiveness of these coping strategies (i.e., coping response efficacy), and (c) whether coping response efficacy predicted exercise intention.

Findings from Study Two supported hypotheses advanced by coping theory (Lazarus & Folkman, 1984) and self-efficacy theory (Bandura, 1997). First, exercise adherers employed a variety of behavioral and cognitive problem-focused strategies when exerting efforts to cope with their acute, negative thoughts. This finding is in accord with coping theory (Lazarus & Folkman,

1984) which suggests that individuals use these types of strategies when they perceive some level of control over an external (e.g., medical procedure) or an internal (e.g., acute, negative thoughts) demand. Second, exercisers perceived that their strategies were effective in managing the impact of their acute, negative thoughts (i.e., high coping response efficacy). Third, coping response efficacy accounted for a significant, although modest, amount of variance in exercisers' perceived change in exercise intention postcoping. These latter two findings are supportive of contentions from self-efficacy theory (Bandura, 1997) that it is important for individuals to believe in the effectiveness of a mean. This type of belief contributes to perceptions of control which, in relation to the current study, should encourage active coping attempts (cf. Bandura, 1997; Skinner, 1996).

In sum, Study Two was particularly important because it provided preliminary evidence that even for a group of exercise adherers with a high motivation to exercise, a moderate benefit to having the means to cope (i.e., coping strategies) with their negative thoughts was perceived. Clearly, continued examination of the coping process was a topic worthy of another investigation.

An interesting suggestion from self-efficacy theory (Bandura, 1997) is that while an individual may have a high coping response efficacy, such beliefs do not ensure that the coping effort will be exerted. Rather, individuals must also believe that they have the abilities to execute the coping strategies. This type of belief is termed coping self-efficacy. Study Three was undertaken to investigate this belief. The specific objectives of the third study were to investigate whether exercisers' (a) coping self-efficacy was predictive of various dependent variables important for exercise performance and (b) coping self-efficacy could be altered by a

hypothesized determinant of self-efficacy (i.e., a persuasive message – self-efficacy theory: Bandura, 1997) and (c) coping self-efficacy was distinct from a behavioral form of self-efficacy (i.e., scheduling self-efficacy). Recall that Study Three participants were beginner or inconsistent exercisers. These exercisers were selected because they may not have experienced sufficient prior mastery in coping with their acute, negative thoughts. Thus, they were expected to have more variable coping self-efficacy beliefs that were more amenable to change compared to the beliefs of experienced exercise adherers (see self-efficacy theory: Bandura, 1997).

Several key findings were obtained from Study Three. First, preliminary evidence of the predictive validity of the coping self-efficacy construct in the exercise domain was obtained. Second, preliminary evidence of the distinctiveness of this type of efficacy from behavioral forms of efficacy (i.e., scheduling self-efficacy) was also obtained. Third, evidence of characteristic differences between positive and negative thinkers on key variables was obtained. Evidence of differences between these groups is in accord with findings from Study One in which positive and negative thinkers were also found to differ on some variables. Fourth, although evidence indicated that the coping self-efficacy manipulation failed, study attrition may have contributed to this failure. In addition, Study Three adherers responded in interesting ways to their exposure to the message (e.g., significant increase in postmessage affect in negative and positive thinkers; adherers who were classified as positive thinkers at Time 1 reported more negative than positive acute thoughts at postmessage).

Some of these key findings provided partial support for hypotheses advanced by self-efficacy theory (Bandura, 1997). Specifically, coping self-efficacy predicted affect experienced postcoping. However, this finding was inconsistent (i.e., predicted at Time 2, postmessage

exposure, but not at Time 1, premessage exposure). Thus, continued examination of the reliability of this finding would be worthwhile. It was also found that coping self-efficacy and scheduling self-efficacy were positively and consistently correlated with exercise intention (i.e., Time 1 and Time 2). These findings support suggestions from self-efficacy theory (Bandura, 1997) that the more efficacious that individuals are in their abilities, the more they will intend to behave. Study Three also found that scheduling self-efficacy, and not coping self-efficacy, predicted exercise intention.

This finding combined with consideration of (a) the other findings for coping and scheduling self-efficacy in their prediction of variables that were most correspondent and (b) the modest correlation between coping and scheduling self-efficacy were encouraging for two reasons. First, these findings support self-efficacy theory (Bandura, 1997) which contends that the predictiveness of efficacy beliefs depends, in part, on the correspondence between the predictor and the criterion. Second, these findings provided preliminary evidence of the distinctiveness of the coping self-efficacy construct from the scheduling self-efficacy construct (i.e., a behavioral form of efficacy). Since coping self-efficacy is concerned with coping with acute, negative thoughts that arise when deciding whether to exercise, this belief should be predictive of variables related to the decision-making process of whether to exercise as planned. Such variables may include the degree of decision struggle, or cognitive rumination and effort, experienced prior to coping with acute thoughts and the overall ease/difficulty of making a decision of whether to exercise after exerting coping efforts. Although these variables have not been typically assessed in the exercise domain, they seem to be logically related to whether exercise is performed. Study Three also provided evidence that these variables comprise distinct

aspects of the decision-making process. Continued examination of the relationship between coping self-efficacy and these variables is warranted. In contrast, since scheduling self-efficacy is concerned with a behavioral ability (i.e., scheduling), this belief should influence related behavioral variables. As outlined, this was found in the current study when this type of efficacy consistently predicted exercise intention.

Findings from Study Three also provided partial support for social cognitive theory (Bandura, 1986). Specifically, this theory suggests that motivated behavior depends, in part, on forethought about potential, future actions. Forethought that the future action is desirable encourages performance of the action. Forethought that the future action is undesirable discourages performance of the action. In regards to the present research, Study Three revealed that acute thoughts about whether to exercise as planned is an important type of forethought. Individuals who had a high frequency of acute, negative thoughts (i.e., negative thinkers) experienced more of a decisional struggle prior to coping and had a lower exercise intention compared to individuals who had a high frequency of acute, positive thoughts (i.e., positive thinkers). These findings and the Study One findings that the overall tone of exercise adherers' acute forethought was associated with differences in attendance self-efficacy and adherence suggests potential moderator effects. Individuals who are more focused on acute thoughts of one type may exhibit corresponding differences in exercise-related social cognitions and behavior. Such a possibility warrants continued examination of characteristic differences between positive and negative thinkers.

Finally, although Study Three did not offer any conclusive evidence that the use of persuasive messages effectively enhanced coping self-efficacy, there is reason to believe that they

hold some promise for future investigation. First, due to the selective study attrition by negative thinkers, individuals who may have been the most susceptible to change (i.e., highest frequency of acute, negative thoughts and moderately low coping self-efficacy) were not exposed to the high coping self-efficacy message manipulation. Second, negative thinkers who read the moderate efficacy message gave some indication of an enhanced coping self-efficacy. Recall that these individuals had a moderate degree of coping self-efficacy prior to message exposure. The change observed in this group raises the speculation that a high coping self-efficacy message may have produced a greater effect. By contrast, all other participants had high premessage coping self-efficacy and the message had little observable effect on them. It is suggested that, in the future, a full test of the effectiveness of persuasive messages should focus upon maintaining extreme individuals targeted for change (i.e., low coping self-efficacy) as participants in the study. If no change in their coping self-efficacy results from message exposure, then it would be fairly safe to conclude that the message was not an effective determinant of coping self-efficacy.

Strengths, Limitation, and Caveats

One strength of the series of studies in this dissertation is that previous research on the influence of acute thoughts on motivated exercise behavior has been extended. A second strength is that these studies were theoretically-based (i.e., self-efficacy: Bandura, 1997; social cognitive: Bandura, 1986; coping: Lazarus & Folkman, 1984). One advantage to the use of theory was that a guiding framework for expected relationships was provided. This framework was particularly important in the current series of studies because of the minimal research that has been conducted on this topic in the exercise domain. A second advantage was that the use of theory (i.e., self-efficacy theory: Bandura, 1997) provided a sound basis for explaining the failure

of the manipulation in the third study (see Brawley, 1993). A third strength is that some variables which comprise the process of the decision-making about whether to exercise were examined (i.e., struggle, decision) and found to be influenced by coping self-efficacy. Although this decision-making process would seem to be relevant to understanding the greater issue of exercise nonadherence, it has received little attention to date in the exercise domain.

Despite these strengths, consideration of study limitations and caveats places the findings into perspective. One limitation is the concurrent assessment of variables. A prospective investigation of the relationships investigated in these studies would provide stronger evidence of their influence and allow for potential tests of reciprocity. A second limitation is the samples consisted of mainly female volunteers who were actively engaged in university or club-based fitness programs. Generalizing the findings from these studies to other exercise populations may be premature. A third limitation is the relatively modest statistical power (which in one study was unavoidable) associated with some of the analyses. Despite this limitation, several significant effects were observed.

One caveat involves the assessment of coping self-efficacy. Specifically, items for the coping self-efficacy scale used in Study Three were derived from an open-ended elicitation procedure with a very specific sample of exercisers (i.e., university and club-based exercisers). These items included thoughts that were salient to this specific context and type of exerciser. Research with different types of exercisers (e.g., home-based runners) should employ them as active-agents in the identification of acute thoughts that are relevant and salient to them.

Finally, there should be an awareness among researchers that the definition of physical activity and exercise is distinct. This distinction is important when examining research questions

about the metabolic cost of exercise and health outcomes or the effect of that cost on the motivation for adherence (i.e., effort and persistence). However, if the research question is focused on the social cognitions (e.g., acute thoughts) important in the decision-making process, then this distinction may be less important because negative thoughts are still hypothesized to effect efficacy and decision-making regardless of whether low or high caloric movement is involved. For example, an arthritic senior may walk (i.e., physical activity: lower caloric movement) in order to improve functional mobility and another arthritic senior may jog (i.e., exercise: higher caloric movement). For the former senior, arthritic pain provokes negative thoughts about walking and similarly, the latter senior also struggles with thoughts about the pain of arthritis. Regardless of whether their past experience is with physical activity or is with exercise, both seniors must deal with negative cognitions which could affect their decision-making about action. Both seniors could also develop equally high self-efficacy to cope with their negative cognitions.

The issue is not the level of activity but whether past experience (i.e., presence or absence) moderates the process that was investigated in the present series of studies. If individuals change their behavior from past to present, the generalizability of the past activity to the present activity would be important in considering whether the individuals did or did not have past experience and thus the resources to cope with negative thoughts.

Future Directions

One suggestion for future research is to conduct a prospective study examining the relationship between acute, exercise-related thoughts, the coping process, decision-making, and motivated exercise behavior. This type of study might provide a more powerful test of the

relationships between these variables and provide preliminary information on the dynamic and possibly changing nature of the relationships. Such a study should include assessment of both coping self-efficacy and coping response efficacy to determine which type of belief is most influential of social cognitive and behavioral outcomes.

A second future direction is for research to continue examining the social cognitions that comprise the decision-making process. In this dissertation an attempt was made to measure two of these social cognitions. First, a one-item gestalt measure of the struggle, or the cognitive rumination and effort, associated with decision-making in the face of acute thoughts and prior to coping was obtained. Second, a one-item gestalt measure of the overall ease/difficulty of making a decision of whether to exercise after exerting coping efforts was obtained. It would be naive to think that this preliminary investigation using these one-item measures fully captured these aspects of the decision-making process. Since the concept to operational definition link is a notorious problem in social psychology (Mudrack, 1989), it would be appropriate to continue the investigation of these aspects of the decision-making process in order to gain a better understanding of how they can most adequately be assessed.

A third future direction is for research to continue examining whether coping self-efficacy can be altered via hypothesized determinants (see self-efficacy theory: Bandura, 1997). If coping self-efficacy can be altered, then the implementation of a broad-based intervention may prove to be fruitful (i.e., enhance exercise adherence: see Baranowski et al., 1998).

A fourth future direction is to examine whether personality variables (e.g., health locus of control, optimism/pessimism) moderate the relationship between acute thinking and coping self-efficacy. For example, optimists may tend to view their world from the 'glass is half full'

perspective and pessimists from the 'glass is half empty' perspective. These perspectives may influence the frequency with which individuals experience acute positive and negative thoughts. For example, optimists may have more frequent acute, positive thoughts than pessimists. Examination of the moderating impact of this variable may help identify negative and positive thinkers.

A related moderator question for future research is to examine whether attitudes influence aspects of exercise decision-making. Specifically, since acute thoughts may serve as the foundation of attitudes (i.e., a more stable psychological construct), it may be useful to examine whether attitudes or acute thoughts solely influence variables important in decision-making or whether both constructs influence these variables.

A fifth future direction is to assess acute thoughts on a daily basis. Doing so would provide evidence of whether acute thoughts can be reliably assessed through a weekly measure (i.e., as in the current series of studies) or whether acute thoughts would be more reliably assessed through daily measures. One way to assess daily thoughts would be to have exercisers carry pagers. They could be paged at various times throughout a planned exercise day and asked to write down their acute thoughts. This type of method has been previously employed in barriers research (e.g., Mannell & Zuzanek, 1991).

A final future direction is to conduct similar research in populations who may experience a greater struggle in the performance of self-regulatory behaviors. For example, individuals with chronic, arthritic pain may not adhere to an exercise program because they may have a high frequency of acute, negative thoughts about their pain and about how their physical condition is perceived to limit exercise behavior. If this is the case, then an intervention that teaches

individuals how to cope with their acute, negative thoughts in conjunction with existing interventions that teach individuals how to self-manage their pain (e.g., managing medication programs: see Holman & Lorig, 1992) may be advantageous. These types of interventions may encourage exercise adherence which would produce many physical and psychological benefits for these chronically diseased individuals.

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Appendix A
Study One
Questionnaire

Study One Questionnaire

*Indicates that the question was used to collect data for Study One. Other questions were used to collect data for a study that was unrelated to the dissertation.

***BACKGROUND INFORMATION**

IMPORTANT: THIS INFORMATION IS STRICTLY FOR THE PURPOSE OF DESCRIBING PEOPLE IN GENERAL AND FOR RECORD KEEPING.

When data is collected, each person is assigned a numerical code and names are discarded in order to respect your privacy. Your name is only used to keep track of this survey and for the accompanying attendance data. Your privacy is guaranteed.

Date: _____

Fitness class days and times signed up for: _____

Type of fitness class: _____

A) Name: _____

B) Phone Number: _____

C) Age: _____

D) Gender: Female _____ Male _____

E) Martial Status:

Single: _____ Divorced _____ Separated _____ Married _____ Widowed _____

F) Primary Occupation:

Please check beside the appropriate category. If RETIRED, CHECK HERE _____ and check below for your occupation prior to your retirement.

Professional _____ Managerial _____ Technical _____ Clerical _____ Student _____
Homemaker _____ Other _____

G) Education

Check beside the category which best describes the **highest level** of education that you have **attained**.

No schooling	_____	Some community college	_____
Elementary school	_____	Community college diploma	_____
Some high school	_____	Some trade, technical, or business school	_____
High school diploma	_____	Trade, technical, or business diploma	_____
Some university	_____		
Bachelor/undergraduate degree	_____		
Earned Masters	_____		
Earned Doctorate	_____		

PLEASE TURN TO NEXT PAGE

H) Exercise History

1) Is this your first time registered in a fitness class at the University of Waterloo?

YES _____ NO _____

2) If **NO**, how many **MONTHS** have you been participating in fitness classes at the University of Waterloo?

MONTHS _____

3) Have you previously participated in fitness classes elsewhere?

YES _____ NO _____

4) If **YES**, how many MONTHS have you been participating in these OTHER fitness classes?

MONTHS _____

5) **IMMEDIATELY PRIOR** to enrolling in **THIS** fitness class were you:

_____ Inactive?

_____ Exercising on your own?

_____ Involved with a University of Waterloo Campus Recreation fitness class in the previous 4 months?

_____ Involved with a STRUCTURED fitness program ELSEWHERE?

_____ Exercising at a health or fitness club (e.g., unstructured)?

6) If you were **EXERCISING PRIOR** to enrolling in **THIS** fitness class:

a) How many times per week? _____ per month? _____

b) How hard was each workout (CHECK ONE):

I) Hard enough to cause approximately 10 continuous minutes of deep breathing _____

II) Hard enough to cause approximately 20 continuous minutes of deep breathing _____

III) Hard enough to cause MORE THAN 20 continuous minutes of deep breathing _____

PLEASE TURN TO NEXT PAGE

EXERCISE BEHAVIOUR QUESTIONNAIRE

*I) EXERCISE THOUGHTS DURING LAST WEEK

During the **LAST WEEK** (7 days), you may have had specific thoughts when considering whether or not to attend your scheduled aerobics classes. Please take a moment to consider the **3 MOST FREQUENT THOUGHTS** that you had in the **LAST WEEK** when considering ***whether or not to attend*** your scheduled aerobics classes.

Once the ***3 most frequent thought*** come to mind, please:

1) FIRST, in column **1**, **LIST EACH THOUGHT** that you had in the **last week** (be specific).

2) SECOND, in column **2**, indicate the **NUMBER OF TIMES** that you had ***each specific thought*** during the **last week**.

	¹ <u>SPECIFIC THOUGHT</u>	² <u>NUMBER OF TIMES</u> (last week)
1.	_____	_____
2.	_____	_____
3.	_____	_____

NOW, considering the **NUMBER OF TIMES** that you had these **3 THOUGHTS** in the **last week**, please indicate:

MOTIVATION AND CONFIDENCE

1) How much influence will these thoughts have on your **motivation to attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

1	2	3	4	5	6	7	8	9
NOT AT ALL INFLUENTIAL								COMPLETELY INFLUENTIAL

b) NEXT 3 WEEKS:

1	2	3	4	5	6	7	8	9
NOT AT ALL INFLUENTIAL								COMPLETELY INFLUENTIAL

PLEASE TURN TO NEXT PAGE

2) When considering these thoughts, how **confident** are you in your ability to **maintain your motivation to attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
 NOT AT COMPLETELY
 ALL CONFIDENT
 CONFIDENT

b) NEXT 3 WEEKS:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
 NOT AT COMPLETELY
 ALL CONFIDENT
 CONFIDENT

ACTUAL ATTENDANCE

3) How much influence will these thoughts have on your **intention to actually attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

1 2 3 4 5 6 7 8 9
 NOT AT COMPLETELY
 ALL INFLUENTIAL
 INFLUENTIAL

b) NEXT 3 WEEKS:

1 2 3 4 5 6 7 8 9
 NOT AT COMPLETELY
 ALL INFLUENTIAL
 INFLUENTIAL

*4) When considering these thoughts, how **confident** are you in your ability to **actually attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
 NOT AT COMPLETELY
 ALL CONFIDENT
 CONFIDENT

*b) NEXT 3 WEEKS:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
 NOT AT COMPLETELY
 ALL CONFIDENT
 CONFIDENT

PLEASE TURN TO NEXT PAGE

***II) PREDICTING MY EXERCISE BEHAVIOUR**

People frequently feel that they will **NOT MERELY TRY** to attend their scheduled aerobics class, but that they **WILL** literally attend. Please answer the following questions with this in mind.

FIRST, indicate in the **blank** the number of times that you **FULLY BELIEVE YOU WILL** attend your aerobics class in the next week and 3 weeks. Be accurate.

SECOND, CIRCLE the number that best represents how strongly you feel this way. Please answer **both** questions.

1) I **will attend** my aerobics class _____ **times** in the **next week**.

1	2	3	4	5	6	7	8	9
DEFINITELY WILL <u>NOT</u>								DEFINITELY <u>WILL</u>

*2) I **will attend** my aerobics class _____ **times per week** for the **next 3 weeks**.

1	2	3	4	5	6	7	8	9
DEFINITELY WILL <u>NOT</u>								DEFINITELY <u>WILL</u>

PLEASE TURN TO NEXT PAGE

*III) EXERCISE THOUGHTS ABOUT THE FUTURE

People often think ahead and forecast what they will be doing. During the **NEXT WEEK** (7 days), you may have specific thoughts when considering whether or not to attend your scheduled aerobics classes. Please take a moment to consider the **3 MOST FREQUENT THOUGHTS** that you anticipate having in the **NEXT WEEK** when considering *whether or not to attend* your scheduled aerobics classes.

Once the ***3 most frequent thoughts*** come to mind, please:

1) FIRST, in column **1**, **LIST EACH THOUGHT** that you anticipate having in the *next week* (be specific).

2) SECOND, in column **2**, indicate the **NUMBER OF TIMES** that you anticipate having *each specific thought* in the *next week*.

1	2
<u>SPECIFIC THOUGHT</u>	<u>NUMBER OF TIMES</u> (next week)
1. _____	_____
2. _____	_____
3. _____	_____

NOW, considering the **NUMBER OF TIMES** that you anticipate having these **3 THOUGHTS** in the *next week*, please indicate:

MOTIVATION AND CONFIDENCE

1) How much influence will these thoughts have on your **motivation to attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

1	2	3	4	5	6	7	8	9
NOT AT ALL INFLUENTIAL								COMPLETELY INFLUENTIAL

b) NEXT 3 WEEKS:

1	2	3	4	5	6	7	8	9
NOT AT ALL INFLUENTIAL								COMPLETELY INFLUENTIAL

PLEASE TURN TO NEXT PAGE

2) When considering these thoughts, how **confident** are you in your ability to **maintain your motivation to attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
NOT AT ALL CONFIDENT										COMPLETELY CONFIDENT

b) NEXT 3 WEEKS:

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
NOT AT ALL CONFIDENT										COMPLETELY CONFIDENT

ACTUAL ATTENDANCE

3) How much influence will these thoughts have on your **intention to actually attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

1	2	3	4	5	6	7	8	9
NOT AT ALL INFLUENTIAL								COMPLETELY INFLUENTIAL

b) NEXT 3 WEEKS:

1	2	3	4	5	6	7	8	9
NOT AT ALL INFLUENTIAL								COMPLETELY INFLUENTIAL

*4) When considering these thoughts, how **confident** are you in your ability to **actually attend** your scheduled aerobic classes in the:

a) NEXT WEEK:

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
NOT AT ALL CONFIDENT										COMPLETELY CONFIDENT

*b) NEXT 3 WEEKS:

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
NOT AT ALL CONFIDENT										COMPLETELY CONFIDENT

THANK YOU FOR YOUR COOPERATION!

Appendix B

Study One

Bivariate Correlations Between Primary Variables: Retrospective

Bivariate Correlations Between Primary Variables: Prospective

Table B1

Bivariate Correlations Between Primary Variables: Retrospective

Variable	1	2	3	4
1. Retrospective	–	.50**	.25	.36*
2. Self-efficacy		–	.56**	.42**
3. Intention			–	.39*
4. Attendance				–

Note. $n = 46$.

* $p < .05$. ** $p < .01$.

Table B2

Bivariate Correlations Between Primary Variables: Prospective

Variable	1	2	3	4
1. Prospective	–	.35*	.21	.09
2. Self-efficacy		–	.55**	.59**
3. Intention			–	.36*
4. Attendance				–

Note. $n = 48$.

* $p < .05$. ** $p < .01$.

Appendix C

Study Two

Questionnaire

EXERCISE THOUGHTS QUESTIONNAIRE

We appreciate you taking the time to answer this questionnaire. The first page deals with collection of general information. The remainder of the questionnaire is designed to identify any negative thoughts that you may have when you consider attending your fitness classes. As well, we are interested in how you try to cope with these negative thoughts and how your intention to exercise may be affected.

It is important that you read each question carefully and respond to each question as honestly as possible. The questionnaire will take approximately 5 - 9 minutes to complete. If you have any concerns resulting from your participation in this study, please contact the Office of Human Research and Animal Care, University of Waterloo (519 888-4567 ext. 6005).

Upon completion of the study, a summary of the findings will be available from the fitness coordinator, or, if you wish, you may contact us directly at the addresses below.

Thank you very much.

Nancy Gyurcsik
Department of Kinesiology
University of Waterloo
Waterloo, ON N2L 3G1
(519)888-4467 (ext. 3153)

Larry Brawley
Department of Kinesiology
University of Waterloo
Waterloo, ON N2L 3G1
(519)888-4567 (ext. 3153)

1) Date: _____

2) Fitness classes that you most regularly attend:

	Class TIME	Class TYPE
Monday	_____	_____
Tuesday	_____	_____
Wednesday	_____	_____
Thursday	_____	_____
Friday	_____	_____
Saturday	_____	_____
Sunday	_____	_____

3) Age: _____

4) Gender: Female _____ Male _____

5) Primary Occupation:

Student _____ Professional _____ Managerial _____ Technical _____
 Clerical _____ Homemaker _____ Other (specify) _____

6) Were you *exercising* in the *previous 4 months*? No (inactive) _____ Yes _____

If **YES**, please provide a ***conservative estimate*** of your ***typical*** exercise pattern each week in the last 4 months:

I) Number of days per week that you exercised? _____

II) How long did each exercise session last? _____ minutes

III) What TYPE of exercise did you do:

- only fitness classes: _____

- only weights: _____

- own aerobic exercise (e.g., run, bike, swim): _____ (specify)

- some combination (e.g., run/weights; aerobics/weights): _____
 _____(specify)

- other (specify): _____

Right now, we want you to think about attending your fitness classes and the thoughts that you may have about them.

We are interested in 2 categories of thought:

1) **NEGATIVE THOUGHTS:** Those *thoughts* that *make you consider not attending* and/or *discourage you from attending* regardless of your actual attendance.

2) **POSITIVE THOUGHTS:** Those *thoughts* that *encourage you to attend* regardless of your actual attendance.

Keep these definitions in mind as you answer the following questionnaire.

QUESTION 1:

Prior to attending their fitness classes, most people experience the two types of thoughts we just described. We are interested in the **SPECIFIC NEGATIVE THOUGHT(S)** that you have in the days just prior to going to your fitness class.

Below is a list of negative thoughts. Please **put a check mark next** to each ***negative thought*** that you have experienced frequently or expect to experience that ***most applies to you***. ***Do not check*** remote possibilities:

<u>Specific Negative Thought</u>	<u>Check only if you have or expect to experience this thought</u>
1. <u>I'm too tired</u>	_____
2. <u>I don't have the time</u>	_____
3. <u>The weather is bad</u>	_____
4. <u>I don't feel like exercising</u>	_____
5. <u>I have school work to do</u>	_____
6. <u>I'm not motivated</u>	_____
7. <u>The class is at a bad time</u>	_____
8. <u>I have job-related work to do</u>	_____
9. <u>I have a social engagement</u>	_____
10. <u>My muscles are too sore</u>	_____
11. <u>I'm too busy</u>	_____
12. <u>I have already exercised</u>	_____
13. <u>The instructor is bad</u>	_____
14. <u>I'm too lazy to exercise</u>	_____

Other **FREQUENT**, specific negative thoughts that I have that are not on the list:

- | | |
|-----------|-------|
| 15. _____ | _____ |
| 16. _____ | _____ |
| 17. _____ | _____ |
| 18. _____ | _____ |

IMPORTANT: This is **PAGE 3**. Carefully **TEAR THIS PAGE OFF** and **PLACE IT TO THE RIGHT OF YOUR QUESTIONNAIRE** so you can use it for the remainder of the questionnaire.

Question 3:

We are now interested in how you try to **COPE WITH** the **NEGATIVE THOUGHTS** that you just checked off.

We are **defining** a **COPING STRATEGY** as:

Any thinking and/or behavioral effort you frequently make in trying to manage the impact that negative thoughts have on your *intention* to attend your fitness classes.

For example, you may think that you are too tired to exercise (negative thought). In order to cope and be motivated, you focus on the weight loss that you want and how you could achieve it by exercising (coping strategy).

In order to ANSWER the next set of questions:

1) Think about the **SPECIFIC COPING STRATEGIES** that you use to manage the impact of your specific negative thoughts.

2) Also think about how much **CONFIDENCE** you have that your *coping strategies* actually work?

A) For the first thought (listed on previous page), think about how you *specifically cope* with it.

i) How *confident* are you that this coping strategy helps (circle appropriate value):

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
not at all confident it helps					moderately confident					completely confident it helps

ii) Now, describe the strategy that you use to cope with this thought (be as *specific* and *clear* as possible): _____

B) For the second thought (listed on earlier page), think about how you *specifically cope* with it.

i) How *confident* are you that this coping strategy helps (circle appropriate value):

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
not at all confident it helps					moderately confident					completely confident it helps

ii) Now, describe the strategy that you use to cope with this thought (be as *specific* and *clear* as possible): _____

C) For the third thought (listed on earlier page) think about how you *specifically cope* with it.

i) How *confident* are you that this coping strategy helps (circle appropriate value):

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
not at all confident it helps					moderately confident					completely confident it helps

ii) Now, describe the strategy that you use to cope with this thought (be as *specific* and *clear* as possible): _____

Appendix D

Study Two

Coping Categories for Time-Related Thoughts

Coping Categories for Specific Commitment Thoughts

Coping Categories for Motivational/Affective Thoughts

Coping Categories for Physical Thoughts

Coping Categories for Class-Related Thoughts

Coping Categories for Ungrouped Thoughts

Further descriptive analyses were conducted in order to better understand the coping categories that individuals typically used when dealing with specific types of negative thoughts. Thus, thoughts were grouped into 6 categories: (a) time-related: no time and too busy, (b) specific commitments: school, work, and social, (c) motivational/affective: don't feel like exercising, not motivated, and too lazy, (d) physical: too tired and muscle soreness, (e) class-related: bad class time and bad instructor, and (f) ungrouped: bad weather, already exercised, and other thoughts.

As seen in Table D1, when attempting to cope with time-related thoughts, exercisers employed a high number of behavioral and cognitive strategies, followed by a combination of these strategies. When dealing with thoughts about specific commitment, motivation/affect, and physical sensations, cognitive strategies were most often used, followed by behavioral and a combination of behavioral and cognitive strategies (see Tables D2, D3, and D4). As well, for specific commitment thoughts, a fairly high number of people did not have any coping strategy for unavoidable events (e.g., work meeting). Finally, when dealing with class-related thoughts, behavioral strategies were most often used (see Table D5).

Table D1

Coping Categories for Time-Related Thoughts

Time-related thoughts	Behavioral (n)	Cognitive (n)	Combination (n)	None (n)	Unclassified (n)
No time	12	13	9	2	5
Too busy	12	12	1	0	7
Percent of all strategies	33	34	14	3	16

Table D2

Coping Categories for Specific Commitment Thoughts

Specific commitment thoughts	Behavioral (n)	Cognitive (n)	Combination (n)	None (n)	Unclassified (n)
School	12	16	5	2	0
Work	5	7	3	4	2
Social	2	2	1	2	1
Percent of all strategies	30	39	14	12	5

Table D3

Coping Categories for Motivational/Affective Thoughts

Motivational/ affective thoughts	Behavioral (n)	Cognitive (n)	Combination (n)	None (n)	Unclassified (n)
Don't feel like it	1	15	2	0	3
Not motivated	3	2	3	1	1
Too lazy	1	4	1	0	0
Percent of all strategies	13	57	16	3	11

Table D4

Coping Categories for Physical Thoughts

Physical thoughts	Behavioral (n)	Cognitive (n)	Combination (n)	None (n)	Unclassified (n)
Too tired	3	49	5	3	3
Muscles sore	5	2	0	0	0
Percent of all strategies	11	73	7	4	4

Table D5

Coping Categories for Class-Related Thoughts

Class-related thoughts	Behavioral (n)	Cognitive (n)	Combination (n)	None (n)	Unclassified (n)
Bad class	7	1	1	0	2
time					
Bad	1	0	0	0	0
instructor					
Percent of all	67	8	8	0	17
strategies					

Table D6

Coping Categories for Ungrouped Thoughts

Ungrouped thoughts	Behavioral (n)	Cognitive (n)	Combination (n)	None (n)	Unclassified (n)
Bad weather	0	5	0	1	1
Already exercised	1	2	0	0	0
Other	4	6	1	2	1
Percent of all strategies	21	54	4	13	8

Appendix E

Study Two

Problem-Focused Cognitive Coping Strategies

Problem-Focused Behavioral Coping Strategies

Problem-Focused Combination Coping Strategies

Table E1

Problem-Focused Cognitive Coping Strategies

Coping strategy	Participants using strategy
	(n)*
Increased energy expectancies	31
Exercise makes me feel better expectancies	20
More awake, alert, and break for the mind expectancies	19
Weight-related expectancies	13
Stress-relief expectancies	11
Eventually look good expectancies	5
Better than doing something else	5
Exercise is very important	5
Be in good shape	4
Not feel as tired/wake me up	3
Be proud of body	1
Others	19

Note. All of these strategies involved participants consciously thinking about these outcomes.

*N = 136.

Table E2

Problem-Focused Behavioral Coping Strategies

Coping strategy	Participants using strategy
	(n)*
Time management	41
Do other activities/exercise	4
Meet someone to exercise with	4
Just do it	4
Arrange transportation	3
Eating and drinking strategies	3
Maintain attendance consistency	3
Stretch	2
Others	5

Note. All of these strategies involved participants actually performing these behaviors.

*N = 69.

Table E3

Problem-Focused Combination Coping Strategies

Coping strategy	Participants using strategy
	(n)
Time management and positive outcomes	19
Meet a friend and think of positive outcomes	5
Take a break for exercise and think of positive outcomes	2
Force self to go and think of positive outcomes	2
Sleep and think of positive outcomes	1
Others	3

Note. All of these strategies involved participants performing behaviors and consciously thinking about the positive outcomes. The outcomes were similar to those reported in Table E1.

*N = 32.

Appendix F

Study Two

Distribution of the Perceived Impact of Thoughts on Initial Intention: Previously Actives

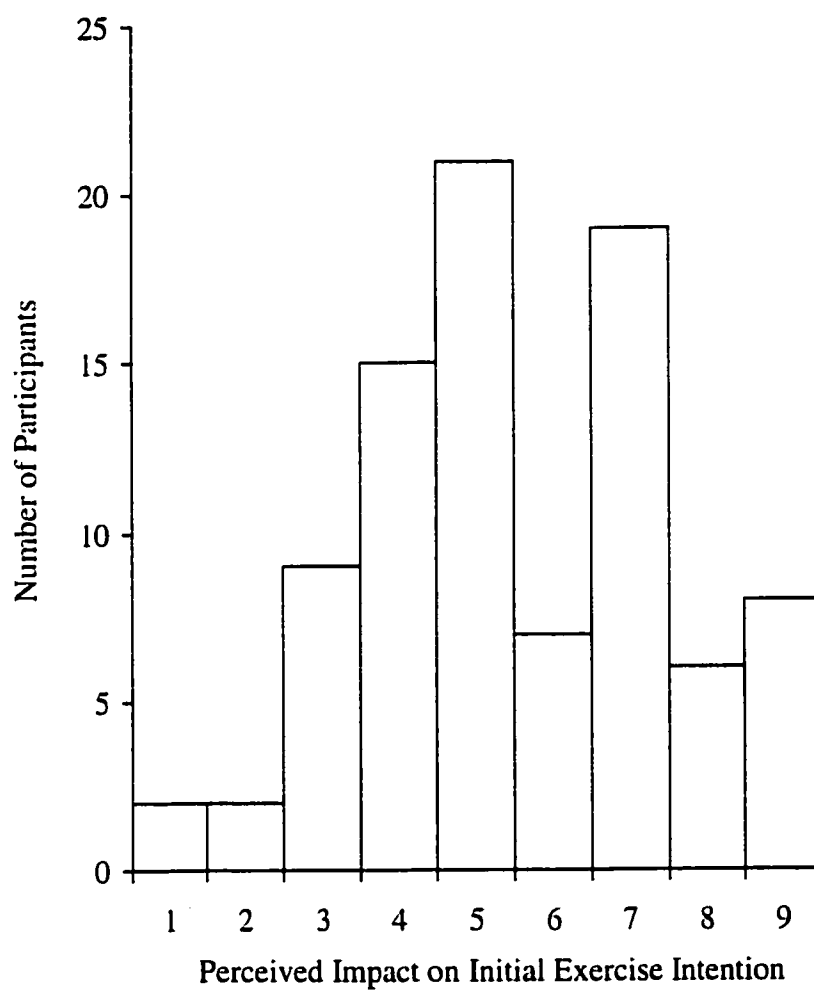


Figure E1. Distribution of the perceived impact that negative thoughts had on initial exercise intention for previously active participants. Scale ranged from 1 (not at all) to 9 (tremendously).

Appendix G

Study Three

Time 1 (Premanipulation) Questionnaire

EXERCISE THOUGHTS QUESTIONNAIRE

Please **READ** each question **CAREFULLY** and respond honestly. The questionnaire will take you about 25 minutes to complete. If you have any concerns resulting from your participation in this study, contact the Office of Human Ethics, University of Waterloo. (519 - 888-4567 ext. 6005). Upon study completion, a summary of group findings will be available from the fitness club manager, or, if you wish, contact us directly (see phone number on previous page).

1) Date: _____ 2) Name: _____
First Last

3) Exercise sessions that you usually plan to do EACH WEEK at the CLUB:

	Check days that exercise is usually planned:	TYPE of exercise that you USUALLY DO on these days (fitness classes, cardio machines, weights, etc.). <i>Please be specific:</i>
Monday	_____	_____
Tuesday	_____	_____
Wednesday	_____	_____
Thursday	_____	_____
Friday	_____	_____
Saturday	_____	_____
Sunday	_____	_____

4) How long have you been a member at the Club? _____ Weeks

5) Home Phone Number: _____

6) Age: _____ 7) Gender: Female: _____ Male: _____

8) **Highest Level of Education to date** (check one):

Some High School _____	High School degree _____
Some college _____	College degree _____
Some university _____	University Undergraduate degree _____
Some Masters _____	Masters degree _____
Some Ph.D. _____	Ph.D. _____

9) **Primary Occupation:**

Student _____	Professional _____	Manager _____	Clerical _____
Homemaker _____	Technical support _____	Other (please specify) _____	

PAST EXERCISE

1) Were you **regularly exercising** (every week for at least 2 days in each week) in the **previous 4 months** (Jan. - April) (check one)? Yes _____ Off and On Active _____ Inactive _____

If **YES** or **OFF and ON**, provide a **conservative estimate** of your **typical** exercise pattern each week in the last 4 months:

a) Average length of each exercise session? _____ minutes

b) What **TYPE** of exercise did you do (check ONE only):

- Only fitness classes at a fitness club _____

- Only cardio machines at a fitness club _____

- Only weight training at a fitness club _____

- Some combination of exercise at a fitness club _____
Write the types of exercise that you did

- exercise NOT at a fitness club (e.g., walk, run, swim, bike): _____
Write type of exercise

c1) Number of days each week that you exercised? _____

c2) Did you **ALWAYS** exercise on this many days **EACH and EVERY WEEK** in the **past 4 months**?

Yes _____ No _____

c3) In the past 4 months (16 weeks), how **MANY WEEKS** in total did you **ACTUALLY** exercise on this many days? Circle one number:

0	2	4	6	8	10	12	14	16	(weeks)
NONE				HALF				ALL	
of the				of the				of the	
weeks in				weeks in				weeks in	
the past				the past				the past	
4 months				4 months				4 months	

Please go to next page

CURRENT EXERCISE

Question A: Frequent Thoughts When Deciding About Going to the Club to Exercise

Although people plan to regularly exercise at a fitness club each week, most people still must **DECIDE** if they should **ACTUALLY GO** to the club to exercise. When making this decision, people have two types of thoughts:

- 1) **POSITIVE THOUGHTS:** Those *thoughts* that encourage or make you consider attending the club in order to exercise regardless of your actual attendance.
- 2) **NEGATIVE THOUGHTS:** Those *thoughts* that discourage or make you consider NOT attending the club in order to exercise regardless of your actual attendance.

Take a moment to consider the *thoughts* that you had *in* the *last week* (7 days) **AND** the thoughts that you believe you will have *in* the *next week* **WHEN DECIDING** whether to attend the club in order to exercise.

These thoughts can be *all positive, all negative, or both types*.

Once the **3 MOST FREQUENT THOUGHTS** come to mind, do the following:

- 1) **FIRST**, in column **1**, **LIST EACH THOUGHT** (BE SPECIFIC).
- 2) **SECOND**, in column **2**, write the **NUMBER OF TIMES** that *each specific thought* arose when deciding.

Column 1
SPECIFIC THOUGHT

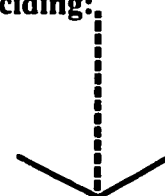
At that time **WHEN ACTUALLY DECIDING** if I should attend the club, I think that:



Example:
I am too hungry.

1. _____
2. _____
3. _____

Column 2
TOTAL NUMBER of times that you'd estimate that these thoughts arose when deciding:



Example:
3

- _____
- _____
- _____

Please go to next page

QUESTION C: Coping Tools for Negative Thoughts

We are now interested in how you usually try to **COPE or DEAL** with these **NEGATIVE THOUGHTS**:

A **COPING TOOL** is *defined as*: Anything that you think or do to deal with the negative thoughts that you have when deciding about whether you should go to the fitness club to exercise.

Exercisers normally use **up to 2 types of COPING TOOLS**:

1) Positive thoughts tool: After having a negative thought, exercisers try to cope with it by thinking about the positive outcomes they get out of exercising. For example, one may think "*I'm too tired to exercise*" (negative thought). In trying to cope, one then thinks a positive thought like "*I'll lose some weight if I exercise*" or "*I'll feel more energetic after I exercise*" (positive thoughts tool).

2) Positive behaviour tool: After having a negative thought, exercisers try to cope with it by **ACTUALLY DOING** something. For example, one may think "*I'm too busy to exercise*" (negative thought). In trying to cope, one actually *schedules exercise into a day planner or makes plans to meet a friend to exercise with* (behavior tool).

2a) Think about the **MOST FREQUENT NEGATIVE THOUGHTS** that you just listed.

Now, list the **SPECIFIC POSITIVE THOUGHTS** and/or **POSITIVE BEHAVIORS** that you believe that you typically use(d) to cope with them. ***BE AS SPECIFIC as possible.***

I cope with my negative thoughts by actually **THINKING** the following **POSITIVE THOUGHTS** and/or by actually **DOING** the following **POSITIVE BEHAVIORS**:

i) _____

ii) _____

iii) _____

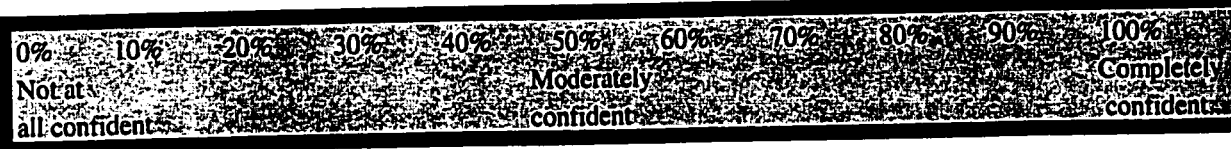
Please go to next page

2b) Your Use of These Coping Tools in the Next 2 Weeks

State your **CONFIDENCE** in *your ability* to use these coping tools *that you just listed* to help you cope with any negative thoughts that you will have in the **NEXT 2 WEEKS**:

Use the scale below to answer. WRITE the confidence value for each question in the space provided.

Answer ALL questions.

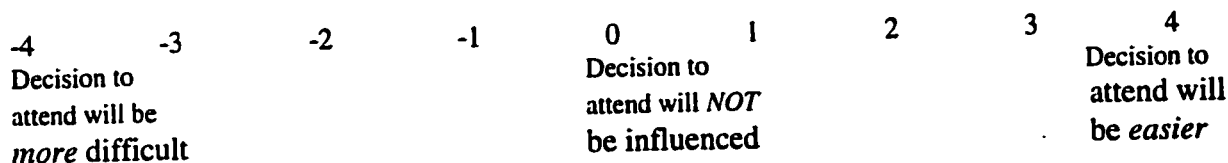


During the **NEXT 2 WEEKS**, I am **CONFIDENT** in my **ABILITY** to **USE MY COPING TOOLS** to:

**0 to 100%
confidence**

- a) Reduce the **impact** of my negative thoughts *about* **not having the time/being too busy** to exercise as planned. _____%
- b) Reduce the **impact** of my negative thoughts *about* **being too tired** to exercise as planned. _____%
- c) Reduce the **impact** of my negative thoughts *about* **having so much work to do** that I can't exercise as planned _____%
- d) Reduce the **impact** of my negative thoughts *about* **not having enough motivation** to exercise as planned. _____%

2c) Circle the number that best indicates whether your **decision to attend your fitness club will be made easier or more difficult *when you use your coping tools* in the next 2 weeks:**



Please go to next page

QUESTION D: Feelings After Coping

After you try to cope with *the negative thoughts* that you have when deciding about fitness club attendance, how much do you experience each emotion:

a) Happy	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
b) Ashamed	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
c) Pleased	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much
d) Depressed	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
e) Competent	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much
f) Guilty	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
g) Proud	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much
h) Upset	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
i) Disappointed	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much

Please go to next page

QUESTION E: Intention to Exercise

1a) How many exercise sessions **WILL you **MAKE** each week during the next two weeks at the fitness club?**

_____ (Sessions each week)

1b) How strongly do you believe that you will make it to this many sessions (circle a number)?

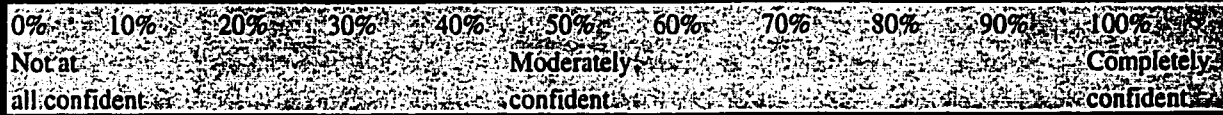
1	2	3	4	5	6	7	8	9
definitely DO NOT believe I will make this many								definitely believe I WILL make this many

QUESTION F: Taking Action

State your **CONFIDENCE** in *your abilities* to **COMPLETE** the *following behaviors* regularly during the next 2 weeks so that you attend your fitness club.

Use the scale below to answer.

WRITE the confidence value for each behavior in the space provided.



My confidence to do the following regularly *over the next 2 weeks* is: 0 to 100%

- a) Making my exercise sessions at the club high on my priority list of weekly activities. _____%
- b) Planning and preparing in advance so nothing interferes with my exercise time at the club. _____%
- c) Rearranging my schedule so that I can fit my exercise sessions into my day. _____%
- d) Making sure I do not miss more than one week of exercise at the club. _____%
- e) Taking time out for myself and going to exercise at the club regardless of other commitments. _____%
- f) Finding a time to exercise at the club that most suitably fits my lifestyle (e.g., early in the morning before work/school). _____%
- g) Getting to my exercise session at the club on time as I have planned. _____%
- h) Putting in 2 or more exercise sessions at the club in my week at equally spaced intervals. _____%

Thank you for your help! See you in two weeks.

Appendix H

Study Three

Time 2 (Postmanipulation) Questionnaire

EXERCISE THOUGHTS QUESTIONNAIRE

Please **READ** each question **CAREFULLY** and respond honestly. The questionnaire will take you about 25 minutes to complete. If you have any concerns resulting from your participation in this study, contact the Office of Research Ethics, University of Waterloo (519 - 888-4567 ext. 6005). Upon study completion, a summary of the findings will be available from the fitness club manager, or, if you wish, contact us directly.

Thank you for all of your help.

Nancy Gyurcsik, Larry Brawley, and Nicolette Langhout. Department of Kinesiology, University of Waterloo. (519)888-4567 (ext. 6587)

1) Date: _____ 2) Name: _____
First Last

3) Exercise sessions that you usually plan to do **EACH WEEK** at the **CLUB**:

	Check days that exercise is usually planned:	TYPE of exercise that you USUALLY DO on these days (fitness classes, cardio machines, weights, etc.). <i>Please be specific:</i>
Monday	_____	_____
Tuesday	_____	_____
Wednesday	_____	_____
Thursday	_____	_____
Friday	_____	_____
Saturday	_____	_____
Sunday	_____	_____

PAMPHLET

Please read the pamphlet that follows as carefully as possible. Take as much time as you need.

When reading the pamphlet, **CIRCLE** with your pencil those **SINGLE WORDS** or **SERIES OF WORDS** that you find **STICK OUT** to you.

Please turn to next page

QUESTION A: Opinion of Pamphlet

Keep in mind the pamphlet that you just read when answering the following questions.
CIRCLE the number that best describes your answer.

1) The pamphlet was informational:

1	2	3	4	5	6	7	8	9
Strongly DISAGREE								Strongly AGREE

2) The pamphlet was aimed at people like me:

9	8	7	6	5	4	3	2	1
Strongly AGREE								Strongly DISAGREE

3) The pamphlet was believable:

1	2	3	4	5	6	7	8	9
Strongly DISAGREE								Strongly AGREE

4) The pamphlet was easy to read:

9	8	7	6	5	4	3	2	1
Strongly AGREE								Strongly DISAGREE

5) The pamphlet was easy to understand:

1	2	3	4	5	6	7	8	9
Strongly DISAGREE								Strongly AGREE

6) The information in the pamphlet was accurate:

9	8	7	6	5	4	3	2	1
Strongly AGREE								Strongly DISAGREE

Please turn to next page

CURRENT EXERCISE

Question B: Frequent Thoughts When Deciding About Going to the Club to Exercise

Although people plan to regularly exercise at a fitness club each week, most people still must **DECIDE** if they should **ACTUALLY GO** to the club to exercise. When making this decision, people have two types of thoughts:

- 1) **POSITIVE THOUGHTS:** Those *thoughts* that encourage or make you consider attending the club in order to exercise regardless of your actual attendance.
- 2) **NEGATIVE THOUGHTS:** Those *thoughts* that discourage or make you consider **NOT** attending the club in order to exercise regardless of your actual attendance.

Take a moment to consider the *thoughts* that you had in the **last week** (7 days) **AND** the thoughts that you believe you will have in the **next week** **WHEN DECIDING** whether to attend the club in order to exercise.

These thoughts can be *all positive, all negative, or both types*.

Once the **3 MOST FREQUENT THOUGHTS** come to mind, do the following:

- 1) **FIRST**, in column **1**, **LIST EACH THOUGHT** (BE SPECIFIC).
- 2) **SECOND**, in column **2**, write the **NUMBER OF TIMES** that *each specific thought* arose when deciding.

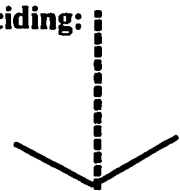
Column 1
SPECIFIC THOUGHT

At that time **WHEN ACTUALLY DECIDING** if I should attend the club, I think that:

Example: 
I have to walk the dog.

- 1. _____
- 2. _____
- 3. _____

Column 2
TOTAL NUMBER of times that you'd estimate that these thoughts arose when deciding:



Example:
3

- _____
- _____
- _____

Please turn to next page

When you **FIRST HAVE** these thoughts, how much do they **MAKE** you **STRUGGLE** with your **DECISION** to exercise at the club (circle one number):

1	2	3	4	5	6	7	8	9
NO				Moderate				Tremendous
struggle:				struggle				struggle:

QUESTION C: Frequent Negative Thoughts

We are now interested in only your negative thoughts.

In the spaces below, **LIST** up to **3 NEGATIVE THOUGHTS** that you *most frequently had* in the *past week* **and/or** that you believe you *will have* in the *next week* when **deciding about attending** the fitness club.

If you listed any negative thoughts on the previous page and these are some of your most frequent thoughts, you can repeat them here. If not, please take a moment to consider your most frequent negative thoughts.

Negative thoughts (be specific):

1. _____
2. _____
3. _____

Please turn to next page

QUESTION D: Coping Tools for Negative Thoughts

We are now interested in how you usually try to **COPE or DEAL** with these **NEGATIVE THOUGHTS**:

A **COPING TOOL** is *defined as*: Anything that you think or do to deal with the negative thoughts that you have when deciding about whether you should go to the fitness club to exercise.

Exercisers normally use **up to 2 types of COPING TOOLS**:

1) **Positive thoughts tool**: After having a negative thought, exercisers try to cope with it by thinking about the positive outcomes they get out of exercising. For example, one may think "*I'm too tired to exercise.*" (negative thought). In trying to cope, one then thinks a positive thought like "*I'll lose some weight if I exercise*" or "*I'll feel more energetic after I exercise.*" (positive thoughts tool).

2) **Positive behaviour tool**: After having a negative thought, exercisers try to cope with it by **ACTUALLY DOING** something. For example, one may think "*I'm too busy to exercise*" (negative thought). In trying to cope, one actually *schedules exercise into a day planner or makes plans to meet a friend to exercise with* (behavior tool).

D1) Think about the **MOST FREQUENT NEGATIVE THOUGHTS** that you just listed.

Now, list the **SPECIFIC POSITIVE THOUGHTS** and/or **POSITIVE BEHAVIORS** that you believe that you typically use(d) to cope with them. ***BE AS SPECIFIC as possible.***

I cope with my negative thoughts by actually **THINKING** the following **POSITIVE THOUGHTS** and/or by actually **DOING** the following **POSITIVE BEHAVIORS**:

i) _____

ii) _____

iii) _____

Please turn to next page

D2) Your Use of These Coping Tools in the Next 2 Weeks

State your **CONFIDENCE** in *your ability* to use these coping tools *that you just listed* to help you cope with any negative thoughts that you will have in the **NEXT 2 WEEKS**.

Use the scale below to answer. WRITE the confidence value for each question in the space provided.

Answer ALL questions.

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

During the **NEXT 2 WEEKS**, I am **CONFIDENT** in my **ABILITY** to **USE MY COPING TOOLS** to:

0 to 100%
confidence

- a) Reduce the **impact** of my negative thoughts *about not having the time/ being too busy* to exercise as planned. _____%
- b) Reduce the **impact** of my negative thoughts *about being too tired* to exercise as planned. _____%
- c) Reduce the **impact** of my negative thoughts *about having so much work to do* that I can't exercise as planned _____%
- d) Reduce the **impact** of my negative thoughts *about not having enough motivation* to exercise as planned. _____%

D3) Circle the number that best indicates whether your decision to attend your fitness club will be made easier or more difficult *when you use your coping tools* in the next 2 weeks:

-4	-3	-2	-1	0	1	2	3	4
Decision to attend will be more difficult				Decision to attend will NOT be influenced				Decision to attend will be easier

Please turn to next page

QUESTION E: Feelings After Coping

After you try to cope with *the negative thoughts* that you have when deciding about fitness club attendance, how much do you experience each emotion:

a) Happy	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
b) Ashamed	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
c) Pleased	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much
d) Depressed	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
e) Competent	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much
f) Guilty	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
g) Proud	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much
h) Upset	9	8	7	6	5	4	3	2	1
	feel very much								don't feel at all
i) Disappointed	1	2	3	4	5	6	7	8	9
	don't feel at all								feel very much

Please turn to next page

QUESTION F: Intention to Exercise

1a) How many exercise sessions **WILL you **MAKE** each week for the next two weeks at the fitness club?**

_____ (Sessions each week)

1b) How strongly do you believe that you will make it to this many sessions (circle a number)?

1	2	3	4	5	6	7	8	9
definitely DO NOT believe I will make this many								definitely believe I WILL make this many

Please turn to next page

QUESTION G: Taking Action

State your **CONFIDENCE** in *your abilities* to **COMPLETE** the *following behaviors* regularly during the next 2 weeks so that you attend your fitness club.

Use the scale below to answer:

WRITE the confidence value for each behavior in the space provided.

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

My confidence to do the following regularly *over the next 2 weeks* is:

0 to 100%

- a) Making my exercise sessions at the club high on my priority list of weekly activities. _____%
- b) Planning and preparing in advance so nothing interferes with my exercise time at the club. _____%
- c) Rearranging my schedule so that I can fit my exercise sessions into my day. _____%
- d) Making sure I do not miss more than one week of exercise at the club. _____%
- e) Taking time out for myself and going to exercise at the club regardless of other commitments. _____%
- f) Finding a time to exercise at the club that most suitably fits my lifestyle (e.g., early in the morning before work/school). _____%
- g) Getting to my exercise session at the club on time as I have planned. _____%
- h) Putting in 2 or more exercise sessions at the club in my week at equally spaced intervals. _____%

Please turn to next page

QUESTION H: Learning More About Coping

1a) I will attend a FREE 30 minute workshop NEXT WEEK at the fitness club to learn more about coping with my negative thoughts (CIRCLE one number):

1	2	3	4	5	6	7	8	9
definitely will NOT attend								definitely WILL attend

1b) If you wish to be contacted for the time of this workshop, please leave:

I) Name: _____ (First and last name)

II) Phone Number: _____

2) I will read ANOTHER PAMPHLET that will be mailed to me NEXT WEEK to learn more about coping with negative thoughts (CIRCLE one number):

1	2	3	4	5	6	7	8	9
definitely will NOT read								definitely WILL read

2b) If you wish to be mailed this pamphlet, please leave your complete mailing address:

Name: _____ (First and last name)

Street: _____

City: _____

Postal code: _____

Please turn to next page

Appendix I

Study Three

High Coping Self-Efficacy Message

Moderate Coping Self-Efficacy Message

High Coping Self-Efficacy Message

Exercise Pamphlet

Usually, people like yourself plan to exercise at fitness clubs on certain days each week, like every Monday, Wednesday, and Friday. Fitness experts have found that on each day that exercise is planned, most people don't just automatically attend their fitness club without first thinking if they should go. In fact, people have many immediate thoughts on these days that help them decide whether or not to exercise at their club as originally planned.

Thoughts that help convince people *not to* exercise are called negative thoughts and are problematic. However, motivation experts have found that with the right strategy, negative thoughts are extremely easy to overcome. Specifically, the experts have found that when exercisers use the following one or two tools, they overcome their immediate negative thoughts about 90% of the time:

1) *Positive Thoughts Tool*

The positive thoughts tool simply requires that exercisers immediately think about their personally important, *positive* outcomes that they get from exercising at their club. Motivation experts have found that almost 100% of the time, most people can very easily bring to mind their desired, expected outcomes. For example, outcomes that exercisers like yourself expect to get may include firming or toning muscles, losing weight, feeling more energized, or relieving stress. Other desired outcomes may include feeling better about yourself as well as other people noticing how much more fit you look.

As you can see, this positive thoughts tool is very easy to *learn* because all of us exercise in order to get some positive outcomes. As well, it is remarkably easy to *use* because you don't need any special gimmick – you just need to fill your mind with the most positive outcomes that you feel you will get out of exercising.

The real benefit of this tool is that it works almost immediately to help us get rid of or dilute our negative thoughts. It has been found to work extremely well when other fitness club exercisers had negative thoughts. It reminded them that little frustrations or worries were incidental and were easily overcome.

Example of how easy this tool is to use: Suppose that on the next day that you plan to exercise at the club, you think that you are too tired to exercise. Right after having this thought, you immediately think about your important positive outcomes such as how much more energy you will have if you exercise, how much the exercise will help you reach your weight loss goal, and how much better you will feel right after you exercise and in general. Rapidly and regularly remind yourself of these things. It's like having your own personal trainer encouraging you. Using this tool will help you make the decision to exercise at the fitness club that day!!

2) *Positive Behaviour Tool*

The positive behaviour tool simply requires that people actively do something to deal

with their immediate negative thoughts. For example, experts have found that in many situations, people do one or two things. First, exercisers make plans to exercise at the club with a significant other or friend so that they are supported in the face of doubts. Second, exercisers use easy time management skills like using a day planner to schedule exercise into their day. This prioritizing of exercise treats exercise as an appointment that simply can't be missed. This is similar to treating a scheduled class, job interview, or social commitment as a 'can't miss' commitment.

This tool is very easy to *learn* because it only requires that you buy a day planner or make plans to meet with someone else who also wants to exercise at the club. These easy-to-do behaviours require only a little bit of planning ahead and very simple time management skills. Carrying out these behaviours shows that you are making a commitment to take time for yourself, despite having negative thoughts. Doing so will help you reach your personally important positive outcomes. Motivation experts have found that this tool also works exceedingly well – that is, 90% of the time.

Example of how easy this tool is to use: Suppose that on a day that you have plans to exercise at the club, you think that you are too busy to do so. Immediately after having this thought, you write the planned exercise session into your day planner or move exercise to another spot that day and adjust the amount of time devoted to the session. Then, exercise has a priority equal to your work and you treat it similarly. Work as planned and exercise as planned!! Take time for yourself. You may also call a friend who is a regular exerciser and make plans to meet at the club. Doing this makes you want to attend exercise because you won't want to let your friend or yourself down. As you can see, these steps are extremely easy to do and take very little time. They will also help you decide to stick with your plans to exercise.

Summary

The next time that you have a negative thought, try using either one or both of the *Positive Thoughts* and *Positive Behaviour Tools*. Remember that a lot of people like you have found that these tools are both very easy to learn and use. They only require a little bit of focus and a few moments of your time. Using these tools will help you gain confidence that you can deal with the indecision that comes from having negative thoughts. This will help you stick with your initial commitment to exercise and help you reach your desired positive outcomes. According to the motivation experts, using these tools makes your decision to exercise easier the next time you have negative thoughts. As a result, you *can* deal with your negative thoughts and you *can* become more decisive!!

What is the bottom-line??? Use these simple tools to water down your negative thoughts and provide solutions so that you will exercise and reach your outcomes!

Moderate Coping Self-Efficacy Message

Exercise Pamphlet

Usually, people like yourself plan to exercise at fitness clubs on certain days each week, like every Monday, Wednesday, and Friday. Fitness experts have found that on each day that exercise is planned, most people don't just automatically attend their fitness club without first thinking if they should go. In fact, people have many immediate thoughts on these days that help them decide whether or not to exercise at their club as originally planned.

Thoughts that help convince people *not to* exercise are called negative thoughts and are problematic. Motivation experts have found that with a lot of practice using the right strategy, negative thoughts may be eventually overcome. Specifically, the experts have found that when exercisers use the following one or two tools over time, there is a chance that their immediate negative thoughts may be overcome:

1) *Positive Thoughts Tool*

The positive thoughts tool requires that exercisers take some time to think about their personally important, *positive* outcomes that they get from exercising at their club. Motivation experts have found that most people need to practice bringing to mind their desired, expected outcomes. For example, after giving it some thought, some outcomes that exercisers like yourself expect to get may include firming or toning muscles, losing weight, feeling more energized, or relieving stress. Other desired outcomes may include feeling better about yourself as well as other people noticing how much more fit you look.

Although most of us have positive exercise outcomes that we can bring to mind, it takes a lot of experience and practice to learn how to use this positive thoughts tool. This tool may be difficult to use at first because you are forced to count on only yourself to fill your mind with the most positive outcomes that you feel you get out of exercising.

Eventually though, with persistence and practice, this tool will be of benefit because it rids you of negative thoughts. It has been found that if exercisers stick with this tool long enough, it helps to remind them that little frustrations or worries have a chance of being overcome.

Example of how to use this tool: Suppose that on the next day that you plan to exercise at the club, you think that you are too tired to exercise. Right after having this thought, you think about your important positive outcomes such as how much more energy you will have if you exercise, how much the exercise will help you reach your weight loss goal, and how much better you will feel right after you exercise and in general. You repeat this process several times in order to help yourself decide to exercise at the club. While you may not be fully successful with this tool on your first attempts, if you keep at it, you will be less indecisive about exercising at the club on that day.

2) *Positive Behaviour Tool*

The positive behaviour tool requires that people actively do something to deal with

their immediate negative thoughts. For example, experts have found that in many situations, people do one or two things. First, exercisers try to make plans to exercise at the club with a significant other or friend. Second, exercisers attempt to use time management skills like using a day planner to schedule exercise into their day. This prioritizing of exercise treats exercise as an appointment that simply can't be missed. This is similar to treating a scheduled class, job interview, or social commitment as a 'can't miss' commitment.

Although this tool is difficult to *learn* at first because it requires that you actually go out and buy a day planner or actually find someone else who also wants to exercise at the club, it may be useful. These behaviours do require some planning ahead and time management skills. Repeatedly carrying out these behaviours when you have negative thoughts shows that you are trying to make a commitment to take time for yourself, despite having negative thoughts. Doing so will help you reach your personally important positive outcomes. Motivation experts have found that if you keep trying these actions over time, some success in getting to exercise finally results.

Example of how to use this tool: Suppose that on a day that you have plans to exercise at the club, you think that you are too busy to do so. Immediately after having this thought, you take some time to write the planned exercise session into your day planner or, if possible, move exercise to another spot that day and adjust the amount of time devoted to the session. Then, exercise has a priority equal to your work and you treat it similarly. Try to work as planned and exercise as planned. Try to take time for yourself. You may also be able to call a friend who is a regular exerciser and make plans to meet up at the club. In doing so, you will be trying to avoid letting your friend or yourself down. As you can see, these steps take some effort and time on your part to carry out. However, if used for a long enough time, this strategy may help you decide to stick with your plans to exercise.

Summary

The next time that you have a negative thought, try using either one or both of the *Positive Thoughts* and *Positive Behaviour Tools*. Remember that a lot of people like you have found that these tools are both fairly difficult to learn and use at first because each time you have a negative thought, the tools require a lot of focus and time. However, also remember that if you use these tools over time they may help you gain confidence that you can deal with the indecision that comes from having negative thoughts. This may eventually help you stick with your initial commitment to exercise and help you reach your desired positive outcomes. According to the motivation experts, using these tools will eventually make your decision to exercise easier when you have negative thoughts. As a result, you can finally deal with your negative thoughts and finally become decisive.

What is the bottom-line??? During the next while, work very hard at using these tools to water down your negative thoughts and provide solutions so that you will exercise and reach your outcomes.

Appendix J

Study Three

Debriefing Letter: High Coping Self-Efficacy Message

Debriefing Letter: Moderate Coping Self-Efficacy Message

Debriefing Letter: High Coping Self-Efficacy Message

Dear Participant:

After two of your fitness classes, you were kind enough to complete questionnaires and read a pamphlet for us. These questionnaires asked you about the thoughts that you had when deciding if you should exercise, how you coped with negative thoughts, how you felt after you tried to cope with them, and your intention to exercise.

In general, through your participation in the study, we hope to better understand the strategies people use to cope with their negative exercise thoughts. We also hope to learn whether it is important for people to be confident that their strategies actually work and, if so, whether this confidence helps to keep one motivated to go to their fitness classes. By finding this information out, future research may be conducted that will eventually help exercisers stick with their exercise programs.

We also would like to explain the *real* purpose of having you read the pamphlet. Specifically, the message contained in the pamphlet was designed to show you how easy it is to learn and use the “Positive Thoughts” and “Positive Behaviour” Coping Strategies. This message was designed in a very *positive* way in an attempt to convince you that these strategies would work right away. We hoped that by reading about these easy-to-do strategies that your confidence in successfully and immediately coping with your negative thoughts would increase. We gave this message to one third of the people who filled out the first questionnaire.

We gave a different message to another one third of the people who were also involved in our study. Specifically, a *bland* message was designed to show the others that with some practice using the “Positive Thoughts” and “Positive Behaviour” Coping Strategies over time, they would be able to successfully cope with their negative exercise thoughts. This message was designed in a very *bland* way so that it didn't convince them that they could use these strategies right away and, as a result, be able to cope with their negative thoughts. In other words, we hoped that they were convinced that with time, they could cope with their negative thoughts.

Finally, another one third of the people involved in our study did not read any pamphlets. These people were not included in this part of the study because they did not fit the criteria – they had an equal number of positive and negative thoughts. In contrast, people included in your group had a higher number of negative than positive thoughts or vice versa.

Based on these messages, we hoped that people reading the bland message did not increase or decrease their confidence that they could cope with their negative thoughts. As a result, we also hoped that their motivation to exercise, mood, and actual exercise behaviour would not change either.

For your group, who read the positive message, we hoped that confidence did increase. As a result, we hoped that motivation, mood, and exercise behaviour would increase. If we find that these things really did happen, then we have shown that it is important to provide exercisers with information on how to cope with their negative thoughts.

Please be assured that the positive message was, in fact, the true message. Please remember how easy the coping strategies are to learn and use and how effective they are in helping you overcome your negative thoughts. Please use these strategies as much as you can.

We also want to point out that we could not tell any of the participants about the true purpose of our study at the outset because doing so may have affected the way people responded to the messages. Specifically, if people in your group knew that they were reading a positive message, they may have answered questions on the time 2 questionnaire in a more positive way because they may have felt some pressure or expectation to do so. In contrast, people reading the bland message may have felt some pressure or expectation to answer more negatively. By not telling people about the true purpose, we wanted to make sure that we were not creating an expectation for people to answer in a way that did not reflect how they actually felt.

Since you now know the true purpose of our study, you are asked to sign the attached form. This form states that you have been fully informed about the true purpose of the study and requests your permission to use your data in our study.

If you have any questions or concerns about any aspect of this study, please contact us at the number provided below or please contact the Office of Human Ethics (888-4567, ext. 6005). We would also like to remind you that this project has been reviewed by and received ethics approval through the Office of Research Ethics at the University of Waterloo.

Thank you for your participation in our study. The results based on group data will be available in written format through your Club's manager in July 1999.

Sincerely,

Nancy Gyurcsik, Larry Brawley, and Nicolette Langhout
Department of Kinesiology, University of Waterloo
888-4567 (ext. 6587).

During the debriefing session, I learned that it was necessary for the researchers to use a mild deception in this study. I understand that this was necessary since having full information about the actual purpose of the study might have influenced the way in which I responded on the questionnaire. Thus, to ensure that this did not happen, some of the details about the purpose of the study initially were provided in a manner which slightly misrepresented the real purpose. However, I have now received a complete verbal and written explanation as to the actual purpose of the study and have had an opportunity to ask any questions about this and to receive acceptable answers to my questions.

I have been asked to give permission for the researchers to use my data (or information I provided) in their study, and agree to this request. I understand that I may withdraw this consent by notifying the Principal Investigator, Dr. L. Brawley, of this decision. I also understand that I may contact the Office of Human Ethics at 888-4567 (ext. 6005) if I have any concerns or comments about my involvement in this study.

Participant's Name (please print): _____

Participant's Signature: _____ Date: _____

Witness Signature: _____ Date: _____

Thank you.

Nancy Gyurcsik, Larry Brawley, and Nicolette Langhout
Department of Kinesiology, University of Waterloo
885-1211 (ext. 6587).

Debriefing Letter: Moderate Coping Self-Efficacy Message

Dear Participant:

After two of your fitness classes, you were kind enough to complete questionnaires and read a pamphlet for us. These questionnaires asked you about the thoughts that you had when deciding if you should exercise, how you coped with negative thoughts, how you felt after you tried to cope with them, and your intention to exercise.

In general, through your participation in the study, we hope to better understand the strategies people use to cope with their negative exercise thoughts. We also hope to learn if it is important for people to be confident that their strategies actually work and, if so, whether this confidence helps to keep one motivated to go to their fitness classes. By finding this information out, future research may be conducted that will eventually help exercisers stick with their exercise programs.

We also would like to explain the *real* purpose of having you read the pamphlet. Specifically, the message contained in the pamphlet was designed to show you that with some practice using the “Positive Thoughts” and “Positive Behaviour” Coping Strategies over time, you would be able to successfully cope with your negative exercise thoughts. This message was designed in a very *bland* way so that it didn't convince you that you could use these strategies right away and, as a result, be able to cope with your negative thoughts. In other words, we hoped that you were convinced that with time, you could cope with your negative thoughts. We gave this message to one third of the people involved in the study.

We gave a different message to another one third of people who were also involved in our study. Specifically, a *positive* message was designed to show the others how easy it is to learn and use the “Positive Thoughts” and “Positive Behaviour” Coping Strategies. We also told them in the pamphlet that these strategies would work right away. We hoped that by reading about these easy-to-do strategies that their confidence in successfully and immediately coping with their negative thoughts would increase.

Finally, another one third of the people involved in our study did not read any pamphlets. These people were not included in this part of the study because they did not fit the criteria – they had an equal number of positive and negative thoughts. In contrast, people included in your group had a higher number of negative than positive thoughts or vice versa.

Based on these messages, we hoped that people reading the bland message did not increase or decrease their confidence that they could cope with their negative thoughts. As a result, we also hoped that their motivation to exercise, mood, and actual exercise behaviour would not change either.

For the other group who read the positive message, we hoped that their confidence did

increase. As a result, we hoped that their motivation, mood, and exercise behaviour would increase. If we find that all of these things really did happen, then we have shown that it is important to provide exercisers with information on how to cope with their negative thoughts.

Since this study is now done, we have attached the positive message that some of the other people received. Please pay attention to how easy the coping strategies are to learn and use and how effective they are in helping you overcome your negative thoughts. Please use these strategies as much as you can.

We also want to point out that we could not tell any of the participants about the true purpose of our study at the outset because doing so may have affected the way people responded to the messages. Specifically, if people in the other group knew that they were reading a positive message, they may have answered questions on the time 2 questionnaire in a more positive way because they may have felt some pressure or expectation to do so. In contrast, people in your group may have felt some pressure or expectation to answer more negatively. By not telling people about the true purpose, we wanted to make sure that we were not creating an expectation for people to answer in a way that did not reflect how they actually felt.

Since you now know the true purpose of our study, you are asked to sign the attached form. This form states that you have been fully informed about the true purpose of the study and requests your permission to use your data in our study.

If you have any questions or concerns about any aspect of this study, please contact us at the number provided below or please contact the Office of Human Ethics (888-4567, ext. 6005). We would also like to remind you that this project has been reviewed by and received ethics approval through the Office of Research Ethics at the University of Waterloo.

Thank you for your participation in our study. The results based on group data will be available in written format through your Club's manager in July 1999.

Sincerely,

Nancy Gyurcsik, Larry Brawley, and Nicolette Langhout
Department of Kinesiology, University of Waterloo
888-4567 (ext. 6587).

During the debriefing session, I learned that it was necessary for the researchers to use a mild deception in this study. I understand that this was necessary since having full information about the actual purpose of the study might have influenced the way in which I responded on the questionnaire. Thus, to ensure that this did not happen, some of the details about the purpose of the study initially were provided in a manner which slightly misrepresented the real purpose. However, I have now received a complete verbal and written explanation as to the actual purpose of the study and have had an opportunity to ask any questions about this and to receive acceptable answers to my questions.

I have been asked to give permission for the researchers to use my data (or information I provided) in their study, and agree to this request. I understand that I may withdraw this consent by notifying the Principal Investigator, Dr. L. Brawley, of this decision. I also understand that I may contact the Office of Human Ethics at 888-4567 (ext. 6005) if I have any concerns or comments about my involvement in this study.

Participant's Name (please print): _____

Participant's Signature: _____ Date: _____

Witness Signature: _____ Date: _____

Thank you.

Nancy Gyurcsik, Larry Brawley, and Nicolette Langhout
Department of Kinesiology, University of Waterloo
885-1211 (ext. 6587).

Appendix K

Study Three

Time 1: Type and Frequency of Acute Positive Thoughts

Time 1: Type and Frequency of Acute Negative Thoughts

Table K1

Time 1: Type and Frequency of Acute Positive Thoughts

Positive thought	Positive Thinkers	Negative Thinkers
	(n)	(n)
Physical outcome expectancy		
More fit, better shape	13	1
Improve appearance	6	--
Weight control (i.e., lose, maintain)	5	3
Tone muscles	2	--
Others	2	1
Motivational/affective		
Motivated to exercise	1	2
Need to exercise	3	1
Enjoyment	8	2
Psychological		
Feel better	10	2
Increased energy	3	--
Stress relief	2	1
Others	2	--
Club-related (e.g., paid for membership)	4	--
Others	5	2

Note. Dashed lines indicate that the thought was not reported by the group.

Table K2

Time 1: Type and Frequency of Acute Negative Thoughts

Positive thought	Positive Thinkers (n)	Negative Thinkers (n)
Physical		
Too tired	10	37
Too hungry	--	9
Sore muscles	--	3
Others	1	4
Specific commitments		
Work/school-related	--	6
Social	1	4
Home	1	4
General lack of time (e.g., too busy)	2	24
Motivational/affective		
Not motivated/don't feel like exercising	1	9
Others	--	1
Others	1	7

Note. Dashed lines indicate that the thought was not reported by any group member.

Appendix L

Study Three

Time 1 Coping Strategies Used by Positive and Negative Thinkers

Table L1

Time 1 Coping Strategies Used by Positive and Negative Thinkers

Coping strategy	Use by positive thinkers	Use by negative thinkers
	(n)	(n)
Positive thoughts	81	47
Positive behaviors	43	36
Combination	2	2
Unclassifiable	1	1

Appendix M

Study Three

Time 1 Correlations Between Primary Variables: Positive Thinkers

Time 1 Correlations Between Primary Variable: Negative Thinkers

Table M1

Time 1 Correlations Between Primary Variables: Positive Thinkers

Variable	1	2	3	4	5	6	7
1. Coping self-efficacy	–	.04	-.45*	.31	.44*	-.32	.64**
2. Thought frequency		–	.21	-.20	.03	-.05	-.13
3. Decision struggle			–	-.01	-.25	.17	-.35
4. Exercise decision				–	.08	.16	.24
5. Exercise intention					–	-.18	.62**
6. Affect						–	-.45**
7. Scheduling self-efficacy							–

Note. $n = 32$.

* $p < .05$. ** $p < .01$.

Table M2

Time 1 Correlations Between Primary Variables: Negative Thinkers

Variable	1	2	3	4	5	6	7
1. Coping self-efficacy	–	.08	-.37*	.41**	.26	-.02	.66**
2. Thought frequency		–	.003	.12	-.13	-.04	.17
3. Decision struggle			–	-.32*	-.16	.35*	-.37*
4. Exercise decision				–	.15	-.15	.42**
5. Exercise intention					–	.12	.48**
6. Affect						–	.09
7. Scheduling self-efficacy							–

Note. $n = 44$.

* $p < .05$. ** $p < .01$.

Appendix N

Study Three

Time 2: Type and Frequency of Acute Positive Thoughts

Time 2: Type and Frequency of Acute Negative Thoughts

Table N1

Time 2: Type and Frequency of Acute Positive Thoughts

Positive thought	Positive Thinkers	Negative Thinkers
	(n)	(n)
Physical outcome expectancy		
More fit, better shape	2	2
Improve appearance	2	1
Weight control (i.e., lose, maintain)	4	2
Tone muscles	4	--
Motivational/affective		
Motivated to exercise	1	2
Need to exercise	1	1
Enjoyment	1	--
Psychological		
Feel better	4	7
Increased energy	2	2
Others	1	--
Club-related (i.e., paid for membership)	1	--
Others	2	4

Note. Dashed lines indicate that the thought was not reported by any group member.

Table N2

Time 2: Type and Frequency of Acute Negative Thoughts

	Positive Thinkers	Negative Thinkers
Positive thought	(n)	(n)
Physical		
Too tired	10	16
Too hungry	--	4
Sore muscles	--	1
Others	1	--
Specific commitments		
Work/school-related	17	7
Social	--	1
Home	4	3
General lack of time (e.g., too busy)	10	12
Motivational/affective		
Not motivated/don't feel like exercising	1	3
Others	1	2
Others	6	1

Note. Dashed lines indicate that the thought was not reported by any group member.

Appendix O

Study Three

Time 2 Coping Strategies Used by Positive and Negative Thinkers

Table O1

Time 2 Coping Strategies Used by Positive and Negative Thinkers

Coping strategy	Use by positive thinkers	Use by negative thinkers
	(n)	(n)
Positive thoughts	42	36
Positive behaviors	36	28
Combination	1	1
No coping strategy	1	--

Note. The dashed line indicates that group members did not report a response for the specific strategy type.

Appendix P

Study Three

Message Quality: Type of Thinker by Type of Message

Table P1

Message Quality: Type of Thinker by Type of Message

	Positive/high ^a	Positive/moderate ^b	Negative/high ^c	Negative/moderate ^d
Variable	(M)	(M)	(M)	(M)
Informational	6.44 (1.50)	7.23 (1.09)	7.55 (1.04)	7.36 (1.22)
Aimed at me	6.00 (2.00)	7.23 (1.23)	6.27 (2.00)	6.71 (2.23)
Believable	6.50 (1.93)	8.15 (.55)	7.09 (1.97)	7.21 (1.72)
Easy to read	7.25 (1.34)	8.08 (1.19)	7.82 (1.17)	7.00 (2.08)
Easy to understand	7.69 (1.70)	8.31 (.95)	8.00 (1.18)	7.36 (1.74)
Accurate information	6.31 (1.74)	7.84 (.99)	6.55 (1.97)	6.71 (1.94)
Overall mean	6.70 (1.17)	7.81 (.77)	7.21 (.78)	7.06 (1.45)

Note. Standard deviations are reported in parentheses.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Appendix Q

Study Three

Time 2 Correlations Between Primary Variables: Positive Thinkers

Time 2 Correlations Between Primary Variables: Negative Thinkers

Table Q1

Time 2 Correlations Between Primary Variables: Positive Thinkers

Variable	1	2	3	4	5	6	7	8	9
1. Cse	–	.47**	.47**	.13	.37*	.32*	.73**	.10	-.06
2. Freq		–	.63**	.25	.46*	.45*	.62**	.06	.14
3. Struggle			–	-.13	-.46*	-.49**	.60**	.13	.12
4. Decision				–	.28	.27	.32	.51**	.58**
5. Intention					–	.51**	.61**	-.21	-.13
6. Affect						–	.42*	.07	.03
7. Sse							–	.19	.03
8. Crbi								–	.80
9. Crb									–

Note. $n = 29$. Time 2 positive thinkers were those participants who remained in the study.

The acronyms are as follows: **Cse** = coping self-efficacy, **Freq** = overall thought frequency,

Struggle = decision struggle, **Decision** = exercise decision, **Intent** = exercise intention, **Sse** = scheduling self-efficacy, **Crbi** = coping-related behavioral intention, and **Crb** = coping-related behavior.

* $p < .05$. ** $p < .01$.

Table Q2

Time 2 Correlations Between Primary Variables: Negative Thinkers

Variable	1	2	3	4	5	6	7	8	9
1. Cse	–	.01	-.27	.24	.34	.25	.50*	-.10	.02
2. Freq		–	-.02	0.18	0.18	.001	.52**	.32	.29
3. Struggle			–	0.36	-.06	.07	-.05	.32	.41*
4. Decision				–	.32	.24	.39	.58**	.65**
5. Intention					–	.41*	.60**	-.04	-.02
6. Affect						–	.71**	.27	.23
7. Sse							–	.13	.11
8. Crbi								–	.92**
9. Crb									–

Note. $n = 25$. Time 2 participants were those individuals who remained in the study. The acronyms are as follows: **Cse** = coping self-efficacy, **Freq** = overall thought frequency, **Struggle** = decision struggle, **Decision** = exercise decision, **Intent** = exercise intention, **Sse** = scheduling self-efficacy, **Crbi** = coping-related behavioral intention, and **Crb** = coping-related behavior.

* $p < .05$. ** $p < .01$.

Appendix R

Study Three

Correlations: Dummy Variables, Time 1 Struggle Covariate, and All Time 2 Predictors

Table R1

Correlations: Dummy Variables, Time 1 Struggle Covariate, and All Time 2 Predictors

Time 2 predictor	Thinker type (dummy)	Message type (dummy)	Time 1 struggle
Cse	-.03	-.07	-.23
Struggle	-.22	-.11	
Decision	.04	.10	
Intent	.05	.02	
Affect	-.04	.07	
Sse	-.08	-.11	-.25

Note. $n = 54$. Time 1 struggle was correlated with only those Time 2 variables used to predict the criterion of Time 2 decision struggle. None of the reported bivariate correlations were significant (i.e., p 's $> .05$). All other bivariate correlations between Time 2 predictors were previously reported in Table 16. The acronyms are as follows: **Cse** = coping self-efficacy, **Struggle** = decision struggle, **Decision** = exercise decision, and **Intent** = exercise intention, **Sse** = scheduling self-efficacy.

Appendix S

Study Three

Adjusted Struggle, Decision, and Affect Means for Main Effects

Adjusted Struggle, Decision, and Affect Means for Interactions

Table S1

Adjusted Struggle, Decision, and Affect Means for Main Effects

Variable	Positive thinker ^a	Negative thinker ^b	High message ^c	Moderate message ^d
	(M)	(M)	(M)	(M)
Struggle	4.22	4.28	4.28	4.26
	(.32)	(.35)	(.33)	(.32)
Decision	2.65	2.65	2.87	2.43
	(.21)	(.22)	(.22)	(.22)
Affect	64.35	65.65	66.04	63.96
	(2.37)	(2.56)	(2.50)	(2.46)

Note. Standard errors are reported in parentheses.

^an = 29. ^bn = 25. ^cn = 27. ^dn = 27.

Table S2

Adjusted Struggle, Decision, and Affect Means for Interactions

Variable	Positive/high ^a	Positive/moderate ^b	Negative/high ^c	Negative/moderate ^d
	(M)	(M)	(M)	(M)
Struggle	3.89 (.44)	4.55 (.46)	4.66 (.46)	3.90 (.46)
Decision	2.79 (.28)	2.51 (.32)	2.95 (.33)	2.34 (.30)
Affect	63.96 (3.18)	64.74 (3.54)	68.12 (3.84)	63.18 (3.40)

Note. Standard errors are reported in parentheses.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Appendix T

Study Three

Time 1 and 2 Decision Struggle in Study Adherers

Time 1 and 2 Exercise Decision in Study Adherers

Time 1 and 2 Exercise Intention in Study Adherers

Time 1 and 2 Scheduling Self-Efficacy in Study Adherers

Table T1

Time 1 and 2 Decision Struggle in Study Adherers

Condition	Time 1 decision struggle	Time 2 decision struggle
	(M)	(M)
Positive thinker/high message ^a	3.12 (1.86)	3.37 (2.06)
Positive thinker/moderate message ^b	3.92 (2.25)	4.38 (1.89)
Negative thinker/high message ^c	4.91 (1.81)	4.94 (1.63)
Negative thinker/moderate message ^d	5.46 (1.57)	4.43 (1.65)

Note. Decision struggle was measured on a 1 (no struggle) to 9 (tremendous struggle) scale.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Table T2

Time 1 and 2 Exercise Decision in Study Adherers

Condition	Time 1 exercise decision	Time 2 exercise decision
	(M)	(M)
Positive thinker/high message ^a	2.32 (1.51)	2.63 (1.41)
Positive thinker/moderate message ^b	3.31 (.95)	2.77 (1.09)
Negative thinker/high message ^c	2.73 (1.27)	2.96 (1.01)
Negative thinker/moderate message ^d	2.57 (1.28)	2.29 (1.27)

Note. Exercise decision was measured on a -4 (decision to attend will be more difficult) to +4 (decision to attend will be easier) scale.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Table T3

Time 1 and 2 Exercise Intention in Study Adherers

Condition	Time 1 intention	Time 2 intention
	(M)	(M)
Positive thinker/high message ^a	8.00 (1.32)	8.06 (.77)
Positive thinker/moderate message ^b	8.54 (.52)	8.08 (.76)
Negative thinker/high message ^c	8.36 (.81)	8.00 (1.00)
Negative thinker/moderate message ^d	7.79 (1.05)	7.93 (1.59)

Note. Exercise intention was measured on a 1 (definitely do not believe I will make this many) to 9 (definitely believe I will make this many) scale.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.

Table T4

Time 1 and 2 Scheduling Self-Efficacy in Study Adherers

Condition	Time 1 SSE	Time 2 SSE
	(M)	(M)
Positive thinker/high message ^a	77.81 (22.08)	80.47 (20.68)
Positive thinker/moderate message ^b	86.57 (12.71)	86.88 (12.30)
Negative thinker/high message ^c	82.13 (17.98)	86.31 (14.05)
Negative thinker/moderate message ^d	78.67 (24.67)	85.82 (15.83)

Note. SSE = scheduling self-efficacy. Scheduling self-efficacy was measured on a 0% (not at all confident) to 100% (completely confident) scale.

^an = 16. ^bn = 13. ^cn = 11. ^dn = 14.