

Is There Positive in the Negative? Understanding the Role of Guilt and Shame in  
Physical Activity Self-Regulation

By

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## Abstract

According to Cybernetic Control theories, negative emotions result when goal progress is thwarted and these emotions facilitate behavioural regulation (Carver & Scheier, 1998). *Self-conscious emotions* are recognized for their self-regulatory functions with guilt and shame being especially central to governing unhealthy behavior change (Dijkstra & Buunk, 2008). However limited research has explored the role of self-conscious emotions and exercise. In light of the concern about low physical activity rates among Canadians (Canadian Community Health Measures Survey, 2011) examining the role of guilt and shame in the self-regulation of exercise is warranted. Purpose. To examine the nature of guilt and shame related to recent exercise behavior. Procedures. In this online, observational study, 128 women and 47 men aged 18-64 (mean age 36, SD = 12.74) completed measures of recent physical activity, trait shame and guilt, exercise identity and demographics at baseline. On both a day when they did and did not engage in intended exercise, participants completed measures of recent exercise quantity and quality, exercise-related state shame and guilt, attributions (on the missed exercise day) and exercise intentions. Results. T-tests revealed that participants experienced more guilt and shame after a missed as opposed to an engaged-in intended exercise session, and that of these two emotions guilt was felt more intensely. Regression analyses determined that perceptions of exercise quality were negatively related to both guilt and shame, however these emotions were not related to exercise intentions. Guilt was associated with the attribution dimension of internal locus of casualty and shame with stability, but no relationships were found between the two emotions and exercise identity. Lastly, logistic regressions showed that shame, but not guilt, was associated with exercise behaviour with

shame showing a negative relationship with behaviour. Findings add to the extant literature on the role of shame and guilt in exercise self-regulation.

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### **Dedication**

I dedicate this thesis to my parents. It is difficult to articulate how influential and inspirational the two of you are to me. You have been my personal cheerleaders and my sounding boards throughout this whole process. Your advice and perspective has been invaluable. You both have such a breadth of knowledge that is endless, thank you for sharing that with me (even when I don't ask for it)! I am so immensely thankful to have such loving, supportive, and intelligent parents.

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## **Chapter I**

### **Introduction**

The contemporary concern about the low physical activity<sup>1</sup> rates of Canadians is well documented. Only 15% of adults accumulate the recommended levels of weekly physical activity (150 minutes of moderate to vigorous physical activity; Canadian Community Health Measures Survey, 2011). These high rates of inactivity occur despite the consistently demonstrated health benefits of physical activity (Warburton, Nicol, & Bredin, 2006; Warburton, Katzmarzyk, Rhodes, & Shephard, 2007). Numerous chronic diseases such as stroke, hypertension, type 2 diabetes, osteoporosis, and colon cancer have all been linked to physical inactivity. It is not surprising that in 2001, inactivity in Canadian adults was associated with \$5.3 billion dollars in direct and indirect health care costs (Katzmarzyk & Janssen, 2004).

The high rates of physical inactivity have led to a recognized need for interventions to promote physical activity participation and adherence (Kahn et al., 2002). However interventions designed to promote physical activity to date have failed to produce long-term results (Bryan, Hutchison, Seals, & Allen, 2007). In order to increase the effectiveness of physical activity interventions, it has been acknowledged that understanding the psychological variables that predict physical activity is an important focus (Baranowski, Anderson, & Carmack, 1998; Bryan et al., 2007).

One psychological variable that has received increased research attention relative to physical activity is emotion. Emotions are recognized for their direct influence on the

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<sup>1</sup> The terms physical activity and exercise will be used interchangeably for the remainder of this document.

self-regulation of behaviour (Baumeister, Vohs, DeWall, & Zhang, 2007). An understanding of the role of emotions in the self-regulation of physical activity may inform intervention efforts (Flora, Strachan, Brawley, & Spink, 2012). Within the broad scope of emotion is a more specific class of emotions referred to as the *self-conscious emotions*. These are defined as emotions that serve a self-regulatory purpose and have the ability to motivate behaviour by providing self-feedback (Tangney, 2003). This thesis looked specifically at the role that self-conscious emotions may play in the motivation of physical activity.

The remainder of this chapter will include a review of the literature beginning with a clear conceptualization of emotions, including their definition and distinction from similar constructs as well as their role in self-regulation. To provide a theoretical context for this thesis theories that address emotions relative to self-regulation are reviewed including both those that see emotion as helpful and those that see emotion as harmful to self-regulation. This theory section is followed by an explanation of self-conscious emotions given their particular relevance to understanding self-regulation. Next, a review of both general and health/exercise related literature about this class of emotions is provided. Measurement considerations relative to emotions and in particular, self-conscious emotions are discussed.

### **Literature Review**

Philosophers have long pondered the definition of *emotion*; in the simplest of terms; emotions are a conscious mental reaction towards an object (Webster, 1953). Emotions, in general, are grounded in bodily expressions and actions, and play an

adaptive part in human functioning (Tangney & Fischer, 1995). Within the psychological literature the terms emotion, affect and mood are often used interchangeably.

Distinguishing between these concepts is vital, as they do not represent the same psychological variables. Although there is a lack of consensus on how these terms should be defined, Forgas (2000) outlines these terms in a manner that clarifies their interrelationships and differences. To start, affect is the broadest of the terms and encompasses both mood and emotions (Forgas, 2000). Having no antecedent cause, moods are less specific and have no cognitive content, whereas emotions have a salient cause and clear cognitive content. These three concepts can all play a role in the self-regulation of behaviour, but research that aims to conceptualize the experience and appraisal of events will often involve the measurement of emotions (Forgas, 2000). Based on this distinction, the focus of thesis will be on emotions.

Although the motivational properties of emotions have long been recognized (Lewis, Haviland-Jones, & Barrett, 1937), traditionally, the majority of empirical research has looked at how emotions impact an individual's cognition patterns (Baumeister et al., 2007). It has since been acknowledged that emotions can influence goal-directed behaviour and how people self-regulate that behavior (Stryker & Burke, 2000) and research in the field has begun to broaden. Prior to a review of this literature, an overview of theories that inform the relationship between emotions and goal-directed behaviour is provided. Through reviewing relevant theories, the breadth of theories that acknowledge emotion as relevant to self-regulation will be highlighted and a theoretical context for the proposed research will be provided.

## **Theoretical Viewpoints on the Role of Emotions in Self-Regulation**

There are a number of theories that support the notion that emotion, and in particular, negative emotions are a central component of the self-regulation of goal-directed behaviour. Other theories counter this notion and uphold the view that negative emotions are harmful to self-regulatory efforts. Below a brief overview of some of the theories representing both viewpoints is provided.

*Supporting theories.* Cybernetic Control theories are influential in the area of self-regulation and present emotions as a facilitator of successful goal attainment. Within the literature this collection of theories has been presented as both Cybernetic Theory as well as Control Theory, and will presently be referred to as Cybernetic Control. This class of theories presents the idea that self-regulation occurs according to a feedback loop system. When pursuing a goal (a desired state) people make assessments of their current state and compare that state to their desired state. When the comparison signals a discrepancy frustration results, which is essential for goal-achievement (Carver & Scheier, 1998). Frustration is the precursor to negative emotion which signals unsatisfactory goal progress and should inspire increased effort at self-regulation to meet the goal (de Ridder & Kuijer, 2006) as a means of alleviating the negative emotion. In sum, negative emotions serve as an adaptive component of the self-regulatory feedback loop in Cybernetic Control theories

There are multiple theories that base their theoretical foundation on the notions presented by Cybernetic Control. A brief overview of a few of these theories demonstrates the pervasive influence of the Cybernetic Control theories and the espoused

notion that negative emotions felt in relation to assessments of goal progress can be an adaptive aspect of self-regulation.

Proponents of Self-Affirmation Theory propose that people are motivated to maintain a view of themselves as adaptive, adequate or coherent (Steele, 1999). If the self is threatened and no longer viewed as coherent, the individual will experience negative emotions, which will motivate action to restore the desired state of self. Also drawing on the idea of Cybernetic Control, the major precept of Affect Control Theory (Heise, 1979) is that a person holds self-views while fulfilling a social role. If certain events are not in line with the social role and the self-meanings held then a negative emotion is experienced and reparative behaviour is implemented (Heise, 1987). Similarly, according to Affect as Information Approach (Schwartz & Clore, 1983; 2007) affect serves informational and directive functions. When a negative emotion is experienced it serves as information to the individual and in turn directs behaviour. In a fourth theory, Theory of Stress and Coping, Folkman and Lazarus (1985) present the idea that distress caused by a self-regulation failure will cause the individual to act and change the situation in hopes to alleviate the feeling of stress. Lastly, in his Self-Discrepancy Theory, Higgins (1987) posits that negative emotion occurs when there is a discrepancy between a person's actual state and their ideal state and that discrepancy is the motivator for change. Taken together, these theories, each rooted within the ideas presented by Cybernetic Control represent a vast body of theoretical perspectives that share the idea of negative emotions facilitate goal-pursuits.

A general Cybernetic Control emphasis provides a useful theoretical foundation for the study of the role of negative emotions in the self-regulation of behaviour. One

Cybernetic Control-based theory, Identity Theory, to our knowledge, is the most frequently employed within the physical activity adherence literature. Given the precedent, further expansion of this theory is provided, followed by a review of its use in exercise adherence research.

According to Identity Theory, an *identity* is a component of the self that is comprised of a set of meanings that define who one is when one occupies a particular role in society (Burke & Stets, 2009). Simply put, the concept of identity formation has been formulated in the literature as “society shapes self shapes social behaviour” (Stryker & Burke, 2000, p. 285). Drawing upon the Cybernetic Control concept (Carver & Scheier, 1998), identities provide a standard for behavior and people compare meanings from the situation with meanings associated with their identities (Burke & Stets, 2009). When this comparison signifies a discrepancy, negative emotions result because the identity standard is not confirmed by situational meanings (Stryker & Burke, 2000). These negative emotions are central to self-regulation; they motivate individuals to act to achieve identity-verification in order to eliminate the negative emotions (Burke & Stets, 2009). The strength or salience of a given identity has implications for the process of identity-verification. People with strong identities experience intense negative emotional reactions when they perceive identity-behaviour inconsistency (Burke & Stets, 2009) and will work hard to reinstate identity verification (Strachan, Brawley, Spink, & Jung, 2009).

Research supports Identity Theory in a variety of domains (Stets & Burke, 2003) including exercise where strength of exercise identity is found to relate to exercise behaviour (Anderson & Cychosz, 1995; Strachan & Brawley, 2008; Strachan, Brawley,

Spink, & Glazebrook, 2010). In their work, Strachan and colleagues (Strachan et al., 2009) looked at emotional reactions to perceptions of identity-behaviour inconsistency. Consistent with theory, participants reported negative emotions when they perceived inconsistency. Specifically, participants' reporting of negative affect increased as their perceptions of inconsistency increased and this relationship was moderated by the strength of their exercise identity; this relationship was strongest for individuals who strongly identified with exercise. While these findings support the idea that individuals experience negative emotional reactions in response to an identity threat, exercise identity research to date has not examined the extent to which these emotional responses *motivate* exercise. This relationship is ripe for investigation as this emotional response may represent reparative action that would re-confirm one's identity (Sabiston, Brunet, Kowalski, Wilson, Mack, & Crocker, 2010).

***Criticisms and opposing views.*** To provide a balanced perspective on the role of emotion in self-regulation, it is important to note criticisms of the Cybernetic Control perspectives as well as other theories that contradict the claim that negative emotion facilitates behavioural self-regulation. Specifically regarding Cybernetic Control theories, some researchers suggest that the mechanistic analogies (e.g., cruise control; a thermostat) employed by this class of theories are too simplistic for the complexities of human behaviour (Ryan & Deci, 1999). According to these critics, this machine-like model does not allow the individual to re-evaluate the goal and adapt their behaviour. This may lead to what de Ridder & de Wit (2006) refer to as *coasting*; the individual becomes stuck on the same track to the desired goal and there is no flexibility in behaviours.

More generally, some theorists such as Tice, Bratslavsky, & Baumeister (2001) advance the idea that negative affect actually impedes successful goal pursuit. Baumeister and colleagues (2007) posit that self-regulation failures happen when there is a conflict between affect regulation and impulse control and this deterioration in self-regulation will impair motivation to adhere to long-term goals (such as eating or smoking; Leith & Baumeister, 1996; Tice et al., 2001). According to this viewpoint, the experience of negative emotions in the face of exercise efforts should leave an individual feeling incapable of exercising (as opposed to being motivated to do so) and that individual would give into an immediate source of gratification (e.g. watching TV on the couch) as an affect management strategy.

This literature however does not specify the nature of the emotions that cause the deterioration in self-regulation. As previously noted negative affect is a broad concept and it is important to distinguish between the negative affect felt in relation to the pursuit of a particular goal and negative affect in a generalized sense. In the work done by Leith & Baumeister (1996) the negative affect that led to self-regulatory failure was often general affect and unrelated to the self-regulatory goal. Carver and Scheier (1998) found that when negative affect originated from the evaluation of progressing towards the goal slower than expected it acted as a source of information because the negative affect in this case was specific to the situation. More work needs to be done in the area to identify which type of emotions lead to motivational behaviours, and which threaten self-regulation.

A theory worth mentioning as it pertains to the role of negative emotions as a form of self-regulation is Self Determination Theory (SDT). This theory has been widely

used within the physical activity literature to examine the relationship between motivation and physical activity (Deci & Ryan, 2008; Fortier, Duda, Guerin, & Teixeira, 2012). While the theory does support the argument that negative emotions motivate behaviour, it calls into question the quality of this motivation. SDT highlights six types of motivational regulations that range from self-determined (internal) to non self-determined (external). SDT proposes that the most internal forms of motivation are positively associated with healthy behaviour outcomes, such as physical activity participation, while external forms are not (Brunet & Sabiston, 2011). The type of regulation of particular relevance for the present discussion is introjected regulation. This motive leads to behaviour enacted for the purpose of the avoidance of shame and guilt (Ryan & Deci, 2000). SDT researchers such as McDonough & Crocker (2007) argue that when individuals are externally motivated by the avoidance of shame and guilt (introjected regulation) they are not engaging in the behavior to feel good, but rather to avoid the feeling of failure and to maintain a feeling of self-worth. Theorists supporting this view may question the quality of guilt or shame as a motivator for physical activity, however introjected regulation has repeatedly been shown to be positively correlated with physical activity (Brunet & Sabiston, 2011; Edmunds, Ntoumanis, & Duda, 2006; Wilson, Rodgers, Fraser, & Murray, 2004) and further exploration of the motivational properties of this regulation is worthwhile.

Theories that suggest that negative emotions are detrimental to self-regulation are clearly at odds with Cybernetic Control-based theories, which uphold negative emotions as pivotal within the self-regulation process. A major aim of this thesis is to examine the role negative emotions play in the self-regulation of physical activity and in doing so

should shed some light on the differing viewpoints advanced by the relevant theories. In service of this end, the concept of self-conscious emotions is now addressed, which represent a specific class of emotions with particular relevance to self-regulation.

### **Self-Conscious Emotions**

Cybernetic Control theories are not very specific about the nature of the emotions that are theorized to influence self-regulation. For example, these theories traditionally do not differentiate between different types of negative emotions or their differential implications for self-regulation. The growing literature on self-conscious emotions and their role in self-regulation may augment Cybernetic Control theories in explaining the role of emotion in self-regulation. In particular the literature on self-conscious emotions provides more specific information about the nature of the types of emotions that have the greatest relevance to self-regulation.

Cybernetic Control theories outline how negative emotions are the product of transgressions relative to a personal standard. Emotions felt in these situations are what Tangney (1996) calls *self-conscious emotions* (some researchers such as Dijkstra & Buunk, 2008 use the term self-evaluative emotions). These emotions are recognized for their implications for self-regulation; they motivate and regulate peoples' thoughts, feelings, and behaviors through providing critical self-feedback (Tangney, 2003). Traditionally, the majority of research on emotions has focused on the more basic, or primary, emotions such as sadness, anger, and happiness since they are more universal, and can be more easily elicited in a laboratory setting (Sabiston et al., 2010; Tracey & Robins, 2004). However, research on self-conscious emotions is beginning to garner attention because of their self-regulatory functions, which have shown to play a large role

in influencing behaviors (Dijkstra & Buunk, 2006; Flora et al., 2012; Hynie, MacDonald & Marques, 2006; Sabiston et al., 2010). An event may elicit either a primary emotion (anger, sadness, happiness, etc.) or it may elicit a self-conscious emotion (shame, guilt, embarrassment and pride; Tangney, 1996). Whether a primary emotion or self-conscious emotion is elicited depends on how the event is viewed by the individual. When the event elicits feelings about personal attributes or behaviors one may feel one of the self-conscious emotions (Tangney, 2003). Self-conscious emotions are considered to be more difficult to assess than primary emotions given that they are not as easily identifiable or expressed with defined facial expressions like the primary emotions (Tangney, 2003). This difficulty has resulted in a lack of theoretical and methodological development in the literature.

Psychologists have been interested in the concept of negative self-conscious emotions for decades but the majority of research has focused on psychoanalytic (see Tilghman-Osborne, Cole, & Felton, 2010 for review) or moral implications (Eisenberg, 2000), or has been conducted in relation to personality and relationships (see Baumeister, Stillwell, & Heatherton, 1994 for review). Negative self-conscious emotions may be of particular relevance to self-regulation; these emotions, when felt in relation to a personal transgression guide our behavior and motivate us to adhere to our moral standards (Tangney, 2003). It is this attribute of self-conscious emotions – their ability to motivate reparative behaviour – where commonality with Cybernetic Control theories can be found. Further, this motivating quality has led researchers to believe that these emotions are a central component that governs the change of unhealthy behaviors (Dijkstra & Buunk, 2008). In their 2010 study, Sabiston and colleagues were the first to look at the

self-conscious emotions and their role on motivating physical activity behavior. They found that self-conscious emotions felt in relation to the body did in fact motivate behaviour. Specifically, the self-conscious emotions found to be of most relevance were guilt and shame.

### **Guilt and Shame**

A focus of this thesis is on the two specific negative self-conscious emotions that are thought to play the largest role in physical activity self-regulation; guilt and shame (Sabiston et al., 2010). In the broadest sense, guilt and shame are subdivided into different types. With regard to guilt, the literature makes a distinction between socio-legal guilt (being found guilty in a legal sense) and emotional guilt (emotional reaction associated with one's action; Baumeister et al., 1994). Early literature on shame and guilt put great emphasis on the moral roles they can play on an individual's behaviour (Ausubel, 1955). However, many of the conclusions drawn from this literature have since been disproven. Emotional guilt and shame is the focus of the majority of current behavior literature and is the type focused on in this thesis. Both shame and guilt have also been subdivided into dispositional and situational varieties. With dispositional (or trait) shame or guilt, the individual is *generally* more prone to feeling one of these emotions whereas with situational (or state) shame or guilt the emotion is elicited by certain situations (Eisenberg, 2000; Tangney, 1996).

With these category-types of guilt and shame in mind, it is important to consider the viewpoints surrounding the more specific definition of these constructs. Philosophers, sociologists, and psychologists have wrestled with the concept of guilt and shame for decades due to the discrepancies in their initially theorized definitions and measurements

(Tilghman-Osborne et al., 2010). Guilt and shame were originally thought to be similar and related to the same outcomes but recent theory and research has identified distinct differences between these two self-conscious emotions (Tangney, 1996) and there is a need to disentangle the two.

Shame and guilt have been distinguished in terms of their proposed antecedents. Ausubel's (1955) early attempt to differentiate between guilt and shame proposed that shame was an emotion stemming from public exposure of some transgressions or shortcomings, while guilt was a "private" experience involving pangs on one's own self conscience. However, empirical work looking at this theory found that solitary (or private) shame was just as prevalent as solitary guilt (Tangney, 1996). Tracey & Robins (2004; 2006) offer an alternative distinction in terms of the antecedents of shame and guilt suggesting that shame is caused when a person attributes the cause of an event to something that is internal, stable, and uncontrollable (i.e. ability) and guilt results when the emotion stems from the occurrence of an internal, unstable, controllable event (i.e. effort). This argument is supported by the tenets put forth by Weiner's (1985) Attribution Theory through which he claims that guilt is elicited by controllable causes and directed inward and is felt when there is a lack of effort toward important goals whereas shame is felt when the event is viewed as uncontrollable (Spink & Nickel, 2013). While attributions have been related to physical activity (e.g. Spink & Nickel, 2010), little research has examined attributions about physical activity in relation to emotions (see Strachan, Flora, Brawley, & Spink, 2011 for an exception) and no research has examined attributions about physical activity in relation to shame and guilt separately. Helen Block Lewis (1971) identifies another antecedent of shame and guilt in her influential book

*Shame and Guilt in Neurosis*. According to Lewis, shame is experienced when the global self is the object of evaluation (e.g. “I am a bad person”) whereas when guilt is felt, the *behaviour*, or the bad thing done, is the focus of the emotion, not the self (e.g. “I did a bad thing”); Baumeister et al., 1994; Lewis, 1971). With this distinction in mind failure to progress towards a physical activity goal may lead to a greater experience of guilt in comparison to shame considering that assessment of not having exercised involves an evaluation of the behaviour. However, no research to date has compared the experience of guilt versus shame relative to failure to engage in intended physical activity.

Other researchers have differentiated shame and guilt in terms of the outcomes. Of pertinent relevance to this thesis, research attributes different motivational influences to guilt versus shame which plays a role in self-regulation; shame motivates people toward separation and distance from the situation and guilt motivates people in a constructive, proactive, future-oriented direction (Dost & Yagmurlu, 2008; Howell, Turowski, & Buro, 2012; Leith & Baumeister, 1998; Tangney, 2003; Tracey & Robins, 2004). Research has shown that even the *anticipation* of these emotions has the capacity to motivate individuals to engage in various behaviors, such as registering for a national bone marrow program (Lindsey, 2005) increasing condom use (Hynie et al., 2006) and decreasing smoking (Dijkstra & Buunk, 2008). Research supports the idea that shame and guilt can have different motivational properties. Leith & Baumeister (1998) hypothesized that guilt would play a role in strengthening and maintaining close relationships while shame was hypothesized to have adverse effects. These hypotheses were supported, which the authors conclude was due to guilt (guilt-proneness in this case) motivating the individual to see the other person’s perspective and rectify the problem. Shame however

was reasoned to elicit an affective response that caused individuals to focus on their own distress leaving the individual unwilling to accommodate or compromise. It would be interesting to determine if the differential motivational properties of guilt and shame also apply within the context of physical activity.

These identified differences in the antecedents and outcomes associated with guilt and shame demonstrated by research make a convincing case that the constructs are separable. The independence of guilt and shame is also supported by the finding that individuals are able to decipher between which of these two emotions are being felt (Dost & Yagmurlu, 2008). This emphasis on the uniqueness of different emotions, in this case guilt and shame, has implications for research that seeks to understand the role of emotions in the self-regulation of behaviour. Though research on the self-conscious emotions of guilt and shame has taken important steps in disentangling these two emotions, very little research has specifically examined these emotions within the broad area of health or the specific area of physical activity.

### **Guilt, Shame, and Health**

One study that has assessed guilt and shame relative to the self-regulation of health behaviours was conducted by Castonguay, Brunet, Ferguson, & Sabiston (2012). The researchers hypothesized that shame or guilt may arise when a woman evaluates a discrepancy in her ideal and actual weight. Using the Weight and Body Related Shame and Guilt Scale (Conradt, Dierk, Schlumberger, Rauh, Hebebrand, & Rief, 2007) these researchers found that the higher the discrepancy between actual and ideal weight the higher the self-reported feelings of the self-conscious emotions, with shame being reported at a higher level than guilt. This is in line with theorizing about self-conscious

emotions, which states that shame is felt when the evaluation is of the self as opposed to a certain behavior (Tangney, 1996; 2003). If the subjects were asked to respond about a behavior that had to do with their body weight, theoretically, levels of reported guilt may have been higher (I ate too much at dinner, I did not exercise today; Castonguay et al., 2012). These findings reiterate the differences between guilt and shame and support the argument that these emotions can be felt separately. Sabiston et al. (2010) recognized the need to advance this research and explore the motivational capabilities of these emotions. Studied within the context of the motivational regulations proposed by Self Determination Theory (i.e. internal or external motivations; Deci & Ryan, 2008) guilt and shame were associated with differing forms of physical activity motivation, with guilt being associated with stronger motivations to exercise. While the results offer significant support for the literature it is important to investigate whether these emotions actually result in an increase in exercise behaviours.

An exercise-related study that examined guilt and shame is worth noting, especially given that this study employed Identity Theory. Flora and colleagues (2012) examined whether participants' level of exercise identity would predict their level of guilt or shame in reaction to an exercise lapse. The authors based their research question within the Identity Theory notion that individuals who endorse an identity experience negative emotions when they perceive a discrepancy between their identity and relevant behaviour. They hypothesized that the strength of an individual's exercise identity would predict negative emotions of shame and guilt. Study findings supported this hypothesis; exercise identity strength was associated with higher levels of guilt or shame when participants were asked to consider an exercise lapse. This study suggests that strength of

exercise identity may influence the level of guilt and shame that people feel when they fail to exercise. Also, this study represents the first exercise psychology study to assess shame and guilt experienced relative to exercise behaviour. However, this study is limited in its ability to generalize to real-life exercise contexts as participants considered hypothetical scenarios. Further, shame and guilt were assessed together (using a general affect scale with one item assessing each emotion) rather than teased out as separate constructs as has been recommended in the self-conscious emotions literature (Tangney, 1996). Finally, the effects of guilt and shame in terms of motivating exercise behaviour were not assessed. While there is mounting support for the argument that guilt may have motivating qualities, empirical work in the field is still limited. This is mainly due to some of the challenges faced in measuring these constructs.

### **Measuring Guilt and Shame**

Measuring affect in regards to cognition or behaviour is not a new concept. Researchers have been studying and measuring these relationships for decades (Forgas, 2000) but much of the work measuring affect in behaviors (specifically exercise) has been done using the Profile of Mood States (POMS). POMS consists of adjectives describing feelings and moods that may have been experienced during the past week in an attempt to measure respondents' total mood disturbance (TMD; Yeun & Shin-Park, 2006). This measure has been argued to lack the specificity to measure the self-conscious emotions of guilt and shame (Lox, Martin-Ginnis, & Petruzello, 2003). This limitation of the POMS may be particularly relevant when examining these emotions relative to their role in self-regulation; capturing people's general mood does not allow for the assessment of self-conscious emotions felt in relation to a specific event or behaviour. It is this type

of specific emotional response, guilt or shame specific to an event/behaviour (e.g. not exercising) that needs to be captured in order to assess the relationship of self-conscious emotions and self-regulation.

Another contentious issue with regard to measuring shame and guilt is that often the two emotions are measured with other emotions and regarded more as a global negative affect construct (Ostir, Cohen-Mansfield, Leveille, Volpato, & Guralnik, 2003; Tracey & Robins, 2004), or shame and guilt are looked at in the same breadth (Castonguay et al., 2012; Leith & Baumeister, 1998; Sabiston et al., 2010). Given that contemporary views of shame and guilt recognize these emotions as conceptually separate (Lewis, 1971; Tangney, 1996), it is important to “tease” out the similarities between the two emotions (Tangney, 1996). Specifically, Tangney and Dearing (2002) recommend the separate assessment of each measure as shame-free guilt and guilt-free shame, so as to avoid the confounding of the two emotions; a problem faced by some guilt/shame measurement tools (e.g. Buss-Durkee Guilt Scales and Mosher Forced-Choice Guilt Scale; Tangney & Dearing, 2002).

Currently in the literature there is little work that looks at the negative self-conscious emotions separately. Sabiston and colleagues (2010) recognized the challenge of differentiating guilt and shame empirically and took the measures to statistically partial out the shared variance and measure guilt-free shame and shame-free guilt. Within this thesis, these methods were adopted in an attempt to measure guilt and shame as separate constructs. It is also recommended that measurements of guilt and shame take into account the previously highlighted distinction between trait and state guilt and shame (Eisenberg, 2000). The majority of research in the area has been done on trait guilt

resulting in a lack of measurement tools to measure state guilt (Tangney & Dearing, 2002). But since Lewis's *Shame and Guilt in Neurosis* (1971) researchers have become increasingly aware of the importance of distinguishing between the different constructs of shame and guilt and the options available to researchers in terms of assessment tools has increased.

Researchers interested in the self-conscious emotions will benefit from devoting attention to past measurement issues and taking care in their choice of measures appropriate for their research questions. Given what is now known about the distinct antecedents and outcomes of shame and guilt, research employing these theories should take the necessary steps to incorporate the idea of guilt and shame as unique constructs within their research design and interpretation. Within this thesis steps were made to distinguish between these emotions to pursue their appropriate measurement.

There is both theoretical and empirical support for the idea that guilt and shame may play a role in self-regulation, yet very little research has examined the role of these self-conscious emotions in the self-regulation of physical activity. The relationship between these two constructs is ripe for investigation. Due to the struggle of producing long-term results in physical activity interventions (Bryan et al., 2007) there is a need to look at the psychological variables that influence physical activity (Baranowski, 1998) and the motivational qualities of guilt and shame present the potential for a strong relationship. In light of these acknowledgments the overall purpose of this thesis was to increase the understanding of the role of shame and guilt in the self-regulation of exercise.

## **Research Questions and Hypotheses**

Drawing on Cybernetic Control theories and the self-conscious emotions literature, the following questions were posed and accompanying hypotheses advanced.

***Question 1:*** Do individuals experience guilt and/or shame relative to their recent exercise behaviour and their perceptions of that exercise behaviour?

***Hypothesis 1:*** a) People will experience more shame and guilt when they *did not* engage in intended exercise as compared to when they *did* engage in intended exercise. b) On days when people *did* exercise, their perceptions of the quality of that exercise will be negatively related to the amount of shame and guilt they report.

***Question 2:*** If individuals experience guilt and/or shame relative to not exercising how intensely do they experience each of these emotions?

***Hypothesis 2:*** Guilt felt in relation to not engaging in intended exercise will be stronger than the shame felt about this failure to exercise.

***Question 3:*** When an intended exercise session is missed is the experience of shame and guilt associated with the experience of attributions as postulated in the self-conscious emotions literature?

***Hypothesis 3:*** When intended exercise sessions are missed, the attribution dimensions of internal locus of causality and personal control will be positively related to the experience of guilt while the attribution dimension of stability will be negatively related. The experience of shame will be positively related to the attribution dimension of internal locus of causality and stability but negatively related to the attribution dimension of personal control.

**Question 4:** On days when people do not engage in intended exercise, do reported levels of shame and guilt relate to reported levels of exercise identity?

**Hypothesis 4:** As level of exercise identity increases so will scores on shame and guilt.

**Question 5:** What effect does the experience of guilt and shame related to a recent missed exercise session have on motivation for (intentions) and engagement in the next intended exercise session?

**Hypothesis 5:** a) Level of guilt felt in relation to not engaging in intended exercise is hypothesized to be associated with future exercise intentions and whether or not participants engage in their next intended exercise session. b) Level of shame is hypothesized to be negatively associated with these future outcomes.

### **Expected Contributions**

This research will add to the minimal amount of existing literature on self-conscious emotions and exercise behavior. Drawing on relevant theory and research, the proposed study will build on past physical activity literature that has assessed affective responses experienced when one is asked to reflect on their recent exercise by (i) teasing apart the two self-conscious emotions of guilt and shame through their separate assessment (ii) determining when and the extent to which each of these emotions are experienced (iii) exploring the acute emotional effects of a single missed exercise session (iv) using real life experience as opposed to reported tendency or hypothetical scenarios to assess these emotions relative to exercise and (v) examining behavioural and cognitive reactions that follow from the experience of guilt and shame. From a theoretical

perspective, these contributions will provide a test of Cybernetic Control-based theories that suggest that negative affect felt in relation to physical activity goal frustration can have motivational properties. Specific to Identity Theory (which represents a Cybernetic Control theory often employed in the exercise adherence literature), the examination of the relationship between identity and the experience of shame and guilt separately will provide a test of a tenet of this theory but in a manner that improves upon previous methodology in terms of the measurement of guilt and shame. Finally, this research will have practical implications for health promotion. Gaining a better understanding of the impact of negative emotions on exercise adherence may aid health professionals on messaging techniques and approaches to facilitate adherence.

## **Chapter II**

### **Methods**

#### **Design**

This study employed both concurrent and prospective assessments gathered through self-reported online data. We chose to administer this study online as doing so allowed for an increase in participant accessibility. The nature of our study required participants to report on their daily exercise behaviours for up to three weeks and provide information about their physical activity in a time-sensitive manner. Using an online forum for this study allowed these requirements to be met. The site was accessible wherever the participant had internet access which would allow for (ideally) quick response after an exercise session.

## **Participants**

Due to the minimal amount of literature exploring the relationship between the emotions of guilt and shame with physical activity it was difficult to accurately calculate power. Past research assessing similar constructs and using similar analyses was considered in determining sample size. Data from 175 participants aged 18-64 years was gathered. This age range was chosen as it reflects the representative age of ‘adults’ within the 2013 Canadian Physical Activity Guidelines (Canadian Society for Exercise Physiology, 2013). Participants with at least some involvement in physical activity over the previous week and who intended to be at least minimally active over the course of the study (three weeks) were pursued. “At least some involvement in physical activity” was defined as engaging in at least one 15-minute bout of physical activity during free time in the past week. Intentions to be “at least minimally active” were defined as intentions for at least one 15-minute bout of physical activity during free time per week over the next three weeks. This sample of a wide range of exercisers was chosen in order (i) to best represent the population of individuals who seek to be physically active, (ii) to ensure that questions about physical activity are relevant and (iii) to provide a sample of participants within whom the assessment of missed physical activity will be relevant. In order to ensure variability in exercise identity scores Carraro’s one item identity measure (Aron, Aron, & Smollan, 1992; Carraro & Gaudreau, 2010) was added to eligibility. Because of the paucity of empirical work in the area there have been no calls for research with specific subpopulations. Further, participants reported freedom from current injury that would limit their physical activity participation, proficiency with reading and writing in English, and be of Canadian residency status.

## Measures

### Baseline Measures

**Demographics.** Participants were asked to provide the following demographic and descriptive information: age, gender, education, marital status, and ethnicity to provide a description of participants (Appendix A, Measure 1).

**Trait Shame and Guilt.** The Test of Self Conscious Affect (TOSCA 3; Appendix A, Measure 2) was used to measure guilt-proneness and shame-proneness. The TOSCA 3 (Tangney, Dearing, Wagner, & Gramzow, 2000) is composed of 16 scenarios yielding indicators of shame proneness, guilt proneness and pride proneness. The final score for each emotion was derived by summing the responses provided on the scale. For instance, the score for shame was tallied by the participant's rating of the answer that correlated with shame for all scenarios. The TOSCA 3 reported alphas of 0.77–0.88 for shame-proneness and 0.70 for guilt-proneness. Within the present study, it reported alphas of .725 and .707 for shame and guilt-proneness respectively. This scale provided a measure for trait guilt and shame, which were used as control variables.

**Exercise Identity Strength.** The Exercise Identity Questionnaire (EIQ; Anderson & Cychosz, 1994; Appendix A, Measure 3) is a 9-item questionnaire that measures the extent to which exercise is descriptive of the respondents' self-concept. The items are scored on a 7-point Likert scale (1-strongly disagree; 7-strongly agree) with questions such as "I consider myself an exerciser". Exercise Identity was then measured by the sum of the nine scale items. Test-retest reliability and internal consistency of this scale has been demonstrated and a Cronbach's alpha of .94 reported (Anderson & Cychosz,

1994). High internal consistency between items was also demonstrated within the present study with an alpha of .913.

#### Measures of Reactions to Exercise

***Physical Activity Intentions.*** Participants indicated the date of their next intended exercise session by completing the Physical Activity Intentions Questionnaire (Appendix B, Measure 1). Knowledge of this date allowed the researcher to know when to contact participants to see if they engaged in intended physical activity. Furthermore, participants' *strength* of intentions to engage in this intended exercise session was assessed using a 9-point Likert scale (1-definitely will not be physically active; 9-definitely will be physically active). This measure of physical activity intentions follows suggestions that using continuous open response scales produces the most accurate responses about social cognitive constructs for repeated behaviours such as exercise (Rhodes, Matheson, & Blanchard, 2006).

***State Shame and Guilt.*** State shame and guilt was assessed by the State Shame and Guilt Scale (SSGS; Marschall, Saftner, & Tangney, 1994; Appendix B, Measure 2), which measures feelings of shame, guilt, and pride *in the moment*. The 15-item questionnaire is comprised of 5 statements for each emotion of shame, guilt and pride that participants rate on a 5 point Likert scale (1-not feeling this way at all; 5-feeling this way very strongly). The questions are generalizable to any situation and participants' guilt and shame scores are derived by summing the responses provided on the scale for each emotion (e.g. items 2,5,8,11,14 represent feelings of shame, items 3,6,9,12,15 represent feelings of guilt). Summing the emotion from 5 questions strengthens the reliability of the scale and is an advancement from other measures deriving a score from

only one response. A study done by Marschall (1996) found the internal reliability for shame and guilt to be .89 and .82 respectively. The present study reported alpha values of .908 and .882 for shame and guilt respectively on “yes” days and .897 and .826 for shame and guilt respectively on “no” days. We strategically chose this measure based on a number of strengths that it offers. This measure is one of the few scales that measures shame and guilt as separate emotions and has shown to reliably capture the emotion felt in the *moment* (Tangney & Dearing, 2002). Recommendations were taken by Tangney (1996) to administer the questionnaire to explicitly refer to the specific behaviour of recent exercise. Further, without the direct use of the words *guilt* and *shame* this measure does not rely on participants’ abilities to distinguish between the two emotions.

***Attributions.*** The Causal Dimension Scale (CDS; Russell, 1982; Appendix B, Measure 3) is based on Attribution Theory and measures respondents’ perceptions of causes in a particular situation. The CDS-II was employed in this study as it has been expanded from the original version to include personal and external control and addresses concerns regarding the consistency of the control dimension (McAuley, Duncan & Russell, 1992). The CDS-II consists of 12 questions about the cause of an event (in this case failed exercise) that participants rated on a 9-point Likert scale. The four attributions measured are locus of causality, stability, external control, and personal control. An example question that captures the stability dimension would be “Is the cause something that is permanent or something that is temporary?” (9-reflects permanent; 1-reflects temporary). The respondent’s score for each dimension was derived by summing the questions associated with the appropriate dimensions. The CDS-II has been shown to have acceptable internal consistency and construct validity (McAuley et al., 1992).

Within the present study attributions were assessed relative to a missed exercise session and Cronbach's alphas derived for the dimensions ranged from .598-.897. By measuring attributions, more information is provided on the nature of guilt and shame in terms of whether particular attributions are associated with each emotion.

***Assessment of Exercise Quality.*** To get a rating of perceived exercise quality on the day when participants did engage in intended physical activity they were asked to use a 10-point Likert scale (1-not at all satisfied; 10-completely satisfied; Appendix B, Measure 4) to rate the quality of their recent exercise session in terms of their satisfaction with both the (i) intensity and (ii) duration of that exercise session. To create an overall quality of physical activity score, the sum of these two items was created.

#### Repeated Measures

***Self Reported Physical Activity Levels.*** The Godin Leisure Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985; Appendix C, Measure 1) is a commonly used self-report measure of physical activity. The questionnaire asks participants to indicate the number of 15-minute bouts of mild, moderate, and strenuous physical activity they engaged in the past month during their free time.

To determine participant eligibility the GLTEQ was modified to ask participants to report on their physical activity levels from the past week, as well as for the following three weeks (Appendix C, Measure 2).

In order to create a categorical variable representing whether or not people exercised the scale was used in the traditional sense with the exception of reference to a time frame of the *past day* rather than *the past month* when asking participants to report their bouts of physical activity (Appendix J). To create this categorical variable,

participants who report one or more 15 minute bouts of physical activity at any intensity were categorized as having engaged in physical activity; those who fail to report any of these bouts were categorized as not having engaged in physical activity.

The GLTEQ has been shown to be a valid (Jacobs, Ainsworth, Hartman, & Leon, 1993) and reliable (Godin & Shepherd, 1985) measurement tool and is a popular resource used to measure exercise behaviour within the health behaviour research (Berry & Strachan, 2012; Sabiston et al., 2010; Murru & Martin-Ginis, 2010).

## **Procedures**

See Appendix D for a flow chart of study procedures.

***Recruitment and Eligibility Screening.*** Upon approval from the Nursing/Education Ethics Review Board participants were recruited by posting the recruitment poster (Appendix E) in various locations including; within community newsletters (Reh-Fit Centre, Winnipeg *in motion*, Louis Riel School Division, HealthCare Connection, Faculty of Kinesiology and Recreation staff and students), Facebook (on University of Manitoba Recreation Services page), posters around campus, Kijiji (posted in Winnipeg, Vancouver, Toronto, Calgary, and Saskatchewan), as well as by speaking to various Recreation Services classes at the University of Manitoba. To provide a small incentive for study participation and to compensate participants for their time a small honorarium (\$5 Amazon gift card) was offered to participants. An e-mail address was provided on all recruitment materials for potential participants to express their interest in participating in the study. Upon emailing the researcher potential participants received a link to the study website.

Upon logging onto the study website, potential participants received a brief description of the study, including participation requirements. Next, potential participants were tested for eligibility (Appendix F) and eligible participants were provided with the informed consent (Appendix G).

***Gather Baseline Data.*** At this time, the eligible participants completed the following: (i) demographic questionnaire, (ii) the TOSCA 3 and (iii) the Exercise Identity Questionnaire. The participants were then asked to indicate the date of their next intended exercise session and were not contacted again until the end of the day on their intended exercise day.

***Follow-up Assessments.*** After completing the baseline measures and indicating the date of their next intended exercise session, participants were followed in order to derive information about (i) their reactions on a day when they *did not* engage in intended exercise, (ii) the effects of these reactions on subsequent intended exercise, and (iii) participants' reactions on a day when they *did* engage in intended exercise (in order to provide a comparison for guilt and shame experienced on a day when one *does not* engage in intended exercise).

Due to the high variation in participant behaviour the length of time a participant was involved in the study varied. Participants were involved in the study for the length of time it took them to complete one intended exercise session and to miss one intended exercise session (up to a maximum of three weeks). The various scenarios in which these two conditions could be met are explained below.

**Scenario One:** At the end of the day on the first intended exercise day (as indicated at baseline), participants received an email with a link to the study website

where they indicated whether they *did* or *did not* exercise that day<sup>2</sup>. If participants reported that they *did not* engage in intended exercise their reactions to having missed an intended exercise session was assessed through the following questionnaires: (i) Causal Dimension Scale and the ii) SSGS. Participants also completed the (iii) Physical Activity Intentions Questionnaire where they indicated their next intended exercise day and rated the strength of their intentions. A second follow-up occurred at the end of the day on the next intended exercise day. This provided an assessment of the effect of reactions to a missed exercise session on subsequent intended exercise. Participants were again asked whether they *did* or *did not* exercise that day. If the participant reported that they *did* engage in intended exercise they were prompted to fill out the following questionnaires which provided an assessment of reactions to having engaged in an intended exercise session: (i) SSGS and (ii) GLTEQ. At this point they had completed the study.

Scenario Two: If however, upon the second follow up the participant responded that they *did not* engage in exercise that day they were prompted to fill out the Physical Activity Intentions Questionnaire where they indicated their next intended exercise day. Follow up continued on intended exercise days until the participant responded *yes* to engaging in the intended exercise session. At this point they were prompted to fill out: (i) SSGS and (ii) GLTEQ so as to provide an assessment of reactions to having engaged in an intended exercise session. At this point study participation was complete.

Scenario Three: If at the end of the day on the first intended exercise day (as indicated at baseline), participants reported that they *did* engage in intended exercise they

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<sup>2</sup> The choice to use participants' own assessment of whether or not they exercised is important as related levels of guilt and shame are more likely to be based on personal rather than external determination of having or having not exercised (e.g., whether or not they meet a minimal amount of physical activity engagement).

were prompted to fill out the following questionnaires in order to assess their reactions to a day when they did engage in intended exercise: (i) Assessment of Exercise Questionnaire, (ii) SSGS, (iii) GLTEQ and (iv) Physical Activity Intentions Questionnaire where they indicated their next intended exercise day. They were then again contacted at the end of the day on their next intended exercise day where they again were asked whether they *did* or *did not* exercise that day. If the participant responded that they *did not* engage in the intended exercise session, they were prompted to fill out: (i) Causal Dimension Scale, (ii) SGSS and (iii) Physical Activity Intentions Questionnaire. This information provided an assessment of reactions to not having engaged in intended exercise. Participants were then contacted again at the end of the day on their next intended exercise day and asked whether or not they exercised that day. This information provided an assessment of the effect of reactions to a missed exercise session on subsequent intended exercise. At this point study participation was complete.

Scenario Four: If however, upon the second follow up the participant responded that they *did* engage in their intended exercise session they were asked to complete the Physical Activity Intentions Questionnaire. They were again contacted at the end of the day on their next intended exercise day and the process continued until an intended exercise session was missed. At that point the participant was prompted to fill out: (i) Causal Dimension Scale, (ii) SGSS and (iii) Physical Activity Intentions Questionnaire so that reactions to having missed an intended exercise session were assessed. They were then contacted again at the end of the day on their next intended exercise day and asked whether or not they exercised that day. This information provided an assessment of the

effect of reactions to a missed exercise session on subsequent intended exercise. At this point study participation was complete.

Once participants completed the measures associated with both conditions (satisfying the three pieces of follow-up information) or once three weeks elapsed (whichever came first) they were informed that the study period was complete, thanked, debriefed about the full purpose of the study, and provided with compensation (debriefing form Appendix H).

### **Analytical Plan**

To address our five research questions, numerous analyses were performed as outlined below. The importance of measuring guilt and shame separately has been argued and supported within this thesis. In recognition of this recommendation steps were taken prior to analysis to create variables of shame free guilt and guilt free shame. Whether this assists in our analyses will be discussed in the results section.

***Analysis One:*** To answer the first research question “Do individuals experience guilt and/or shame relative to their recent exercise behaviour and their perceptions of that exercise behaviour” two paired samples t-tests were employed. The first compared the mean of shame-free guilt on “yes” days to the mean of shame-free guilt on “no” days while controlling for trait guilt. Another compared the mean of guilt-free shame on “yes” days to the mean of guilt-free shame on “no” days while controlling for trait shame.

The second analysis only used data collected on days when people *did* exercise. Two linear regression analyses were employed; one examined the association between shame-free guilt (controlling for trait guilt) and perceptions of quality of exercise (shame-free guilt was regressed on perceptions of quality of exercise); the other examined the

association between guilt-free shame (controlling for trait shame) and perceptions of quality of exercise (guilt-free shame was regressed on perceptions of quality of exercise).

*Analysis Two:* A paired sampled t-test was employed to address the second research question “if individuals experience guilt and/or shame relative to exercise how intensely do they experience each of these emotions?” The mean level of shame-free guilt and the mean level of guilt-free shame on the day that participants did not exercise were analyzed.

*Analysis Three:* The third analysis explored whether if after a missed intended exercise session the experiences of shame and guilt were associated with the experience of attributions as postulated in the self-conscious emotions literature. Using only data from the days when people did not exercise, two regression analyses were employed. In the first analysis all attributional dimensions were entered into a block as predictors of shame-free guilt while controlling for trait guilt. In the second analysis all attributional dimensions were entered into a block as predictors of guilt-free shame while controlling for trait shame.

*Analysis Four:* To address the fourth research question “on days when people do not engage in intended exercise, do reported levels of shame and guilt relate to reported levels of exercise identity” two linear regressions were employed. In the first regression, the association between exercise identity and shame-free guilt (controlling for trait guilt) were assessed (exercise identity was regressed onto shame-free guilt); in the second regression, the association between guilt-free shame (controlling for trait shame) and exercise identity was assessed (exercise identity was regressed onto guilt-free shame).

***Analysis Five:*** To address the final question “what effect does the experience of guilt and shame related to recent exercise behaviour have on motivation for (intentions) and engagement in the next intended exercise session” a series of regression analyses were conducted on data from days when people *did not* exercise. To assess the impact of guilt and shame on intention strength, a separate linear regression analysis was used for each of shame-free guilt and guilt-free shame. For each regression exercise intention strength was regressed on guilt-free shame (controlling for trait shame) and shame-free guilt (controlling for trait guilt). To assess the impact of guilt and shame on exercise engagement, two logistic regressions were employed, one for guilt-free shame and one for shame-free guilt. In each regression, guilt-free shame/shame-free guilt (controlling for trait guilt/shame, as well as past exercise behaviours) was assessed for their ability to predict whether or not people engaged in their next intended exercise session.

### **Chapter III**

## **Results**

### **Data Management**

Recommendations by Tabachnick & Fidell (2007) and Pallant (2010) guided the data cleaning and preparation process. Data was assessed for correct entry and composite scores were created. Missing data was examined; we found less than 5% of data were missing for all variables. Missing Value Analysis was used and it was determined that the data was missing at random. Missing data were then replaced using Expectation Maximization. Data was then assessed for univariate outliers. First, the standardized

values were converted to z-scores. Z-scores above 3.29 and below -3.29 were considered univariate outliers. When outliers were detected the original values for these scores were altered to be one unit larger or smaller than the next most extreme score. Next, the distribution of each continuous variable was assessed for normality (skewness and kurtosis). In some datasets state guilt “yes” and state shame “yes” and “no” were not normally distributed. Transformations were applied but in some cases, these alterations did not appear to yield normal distributions so the variables were left untransformed (following recommendations by Tabachnick & Fidell, 2007). However, violations of assumptions were assessed for each analysis and in each case no assumptions were violated.

### **Creating Residuals**

Researchers of self-conscious emotions recognize the difficulties associated with directly measuring guilt and shame (Tangney, 1996). In light of these acknowledged difficulties, we were strategic in our choice of measure for consideration of these emotions. We chose to employ the State Shame and Guilt Scale (Marschall et al., 1994). This scale was designed to independently capture each emotion of shame and guilt. Therefore, we felt it provided us with the most suitable measure available for assessing these emotions in a manner that respects their distinct characteristics. Despite the efforts to measure these variables relative to their unique attributes state guilt and shame were highly correlated in our sample ( $r = .84$  and  $.75$  for the yes and no day variables respectively).

Some guilt and shame researchers have tried to deal with the enmeshed relationship between guilt and shame by statistically extricating the two emotions prior to

using them in analyses (e.g., Sabiston et al., 2010; Tangney & Dearing, 2002). This process results in ‘shame-free guilt’ and ‘guilt-free shame’ variables that represent what is left over in one variable when the shared variance of the other variable is removed. We created shame-free guilt and guilt-free shame variables and considered whether doing so resulted in less overlap than the original, unaltered variables. These residual variables were created by running a regression analysis and saving the resulting residuals. To create guilt-free shame, guilt was entered as the dependent variable predicting shame, whereas for shame-free guilt, shame was entered to predict guilt. When these residual variables were examined very little variance remained in guilt or shame once the shared variance of the other variable was removed. For this reason there was no advantage to using guilt-free shame and shame-free guilt in the analyses. We chose to move forward with the original data of guilt and shame, but to examine each in separate models given their strong relationship. This decision finds support from established precedent to use the original, unaltered variables in analyses; other researchers who have employed the State Shame and Guilt Scale (Dorahy, Corry, Shannon, Webb, McDermott, Ryan & Dyer, 2013; Ghatavi, Nicolson, MacDonald, Osher, & Levitt, 2001) did not create shame-free guilt and guilt-free shame variables.

### **Description of Participants**

A total of 265 individuals logged onto the study site and began the eligibility questionnaire; 62 of those individuals did not meet eligibility requirements. The remaining 203 participants began the baseline questionnaires, however 10 participants did not provide complete baseline information and their data was not analyzed. Of the remaining 193 participants, 18 dropped out after the first follow up email and, for these

individuals, only information at baseline was gathered. The remaining 175 participants provided responses beyond baseline. Of these 175 participants, 35 dropped out after only responding to the first follow up and their data was only analyzed at baseline. 97 participants met both conditions (no day, yes day), 39 only reported a “yes” condition, and 4 only reported a “no” condition. Because of the differing outcomes, the N used in each analysis differed and will be specified when the results are presented.

The final sample consisted of 175 participants with a mean age of 36 years ( $SD = 12.74$ ), 128 (73.14%) females and 47 (26.86%) males. Eighty-one percent of the participants were Caucasian, forty-nine percent were married, and eighty-seven percent of them lived in Manitoba. Furthermore, 44% had a University degree, 59% were employed full-time and 36% of the sample heard about the study through a University of Manitoba advertisement.

*Table 1: Participant Demographics*

<b>Variable</b>	<b>N</b>	<b>%</b>
<b><i>Sex</i></b>		
Male	47	26.86
Female	128	73.14
<b><i>Learned About Study</i></b>		
Facebook	18	10.3
Email	25	14.3
U of M advertisement	52	29.7
Community advertisement	24	13.7
Other	26	14.9
<b><i>Cultural Status</i></b>		
Caucasian	136	77.7
Aboriginal	2	1.1
Hispanic	4	2.3
African American	1	.6
Asian	21	12
Other	5	2.9

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<b><i>Marital Status</i></b>		
Single	61	34.9
Married	83	47.4
Common law	15	8.6
Divorced	7	4
Separated	3	1.7
<b><i>Education</i></b>		
Elementary	2	1.1
Secondary	24	13.7
College	38	21.7
University	74	42.4
Post-graduate	31	17.7
<b><i>Employment</i></b>		
Student	32	18.3
Full time	100	57.1
Part time	20	11.4
Stay at home parent	10	5.7
Retired	7	4
<b><i>Province</i></b>		
Saskatchewan	2	1.1
Quebec	1	.6
Ontario	16	9.1
NW Territories	1	.6
Nova Scotia	1	.6
New Brunswick	1	.6
Manitoba	142	81.1

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### **Main Analysis**

We adhered to recommendations to consider controlling for the influence of trait guilt and shame in analyses (Tangney & Dearing, 2002). To inform our decision we examined the correlation between the trait and state variables. For both guilt and shame, trait and state emotions were not significantly correlated. Therefore the research questions employing a t-test did not include the trait variables. However, in order to

control for potential correlation with the various dependent variables, the regression analyses still included these variables as covariates (Tabachnick & Fidell, 2007).

A paired samples t-test was employed to evaluate the difference between participants' level of guilt reported on a "yes" as compared to a "no" day. Another paired-samples t-test was used to compare participants' level of shame on "yes" and "no" days. By necessity, participants' data was only used if they completed both the "yes" and "no" conditions (N=97). The t-test comparing guilt on a "no" day to guilt on a "yes" day revealed a significant difference  $t(96) = -10.784, p < .0001$  (two-tailed). Participants reported greater guilt on their "no" day (M=10.83, SD=4.354) than on their "yes" day (M=6.5, SD=2.847). The mean increase in guilt "no" was 4.328 with a 95% confidence interval ranging from -5.125 to -3.532. The eta-squared statistic (.5) indicates that this is a large effect size (according to guidelines proposed by Cohen, 1988; Pallant, 2010). The second paired samples t-test comparing shame on "yes" and "no" days also revealed a significant difference,  $t(96) = -7.075, p < .0005$  (two-tailed). Participants reported more shame on their "no" day (M= 8.66, SD= 4.39) than they did on their "yes" day (M=5.89, SD=1.833). The mean increase in shame "no" was 2.771 with a 95% confidence interval ranging from -3.549 to -1.994. The eta-squared statistic (.3) indicates a large effect size.

Next, to analyze the relationship between the emotions of guilt and shame and participants' perceptions of the quality of their exercise two linear regression analyses were conducted. Using data taken from a "yes" day (N=135), state guilt/shame was regressed onto perceptions of exercise quality while first controlling for trait guilt/shame for both of these analyses. The first linear regression, which examined perceptions of exercise quality in relation to state guilt on a "yes" day, was significant (R square = .186,

$p > .001$ ). The relationship between perceptions of exercise quality and state guilt was negative in nature (Beta  $-.429$ ). Trait guilt was not a significant covariate. The second linear regression examined perceptions of exercise quality in relation to state shame on a “yes” day and was also significant (R square =  $.257$ ,  $p > .001$ ). This relationship was also negative in nature (Beta  $-.499$ ). Trait shame was not a significant covariate.

A paired samples t-test comparing participants’ levels of state guilt and shame reported on a “no” day ( $N=101$ ) revealed that participants reported significantly more state guilt ( $M=10.79$ ,  $SD= 4.332$ ) than state shame ( $M=8.68$ ,  $SD= 4.376$ ),  $t(99) = -6.613$ ,  $p < .0001$  (two-tailed) on a day when they did not engage in an intended exercise session. The mean increase in scores was  $2.118$  with a 95% confidence interval ranging from  $-2.753$  to  $-1.482$ . The eta-squared statistic ( $.3$ ) indicates a large effect size.

Two regression analyses were used to examine the relationship of state guilt and shame with the causal dimensions with which each variable is theorized to be associated. A regression analysis was used to assess the relationship of the causal dimensions predicted to be related to the experience of guilt (internal locus of causality, personal control, and stability,) with levels of guilt on a “no” day while controlling for trait guilt ( $N=101$ ). In step one, trait guilt was entered as a covariate and did not significantly influence the model. All attributions were entered as a block in step two. Locus of causality was significantly associated with state guilt (R square =  $.136$ ,  $p > .05$ ) and this relationship was positive (Beta  $.393$ ). No other causal dimensions were significantly related to state guilt scores. The second regression analysis assessed the ability of the causal dimensions predicted to be associated with shame (internal locus of causality, external control, and stability) to predict levels of shame on a “no” day. In step one, trait

shame was entered as a covariate and did not significantly influence the model. All attributions were entered as a block in step two. Only stability was significantly associated ( $R^2 = .378$ ,  $p > 0.5$ ) and positive (Beta .248). Personal control was negatively related (Beta -.041), however it was not significant. It should be noted that the variance inflation factor (VIF) was assessed and did not suggest multicollinearity.

A regression analysis was used to assess the relationship between guilt and exercise identity on a “no” day (N=101). In step one, trait guilt was entered as a covariate and did not significantly contribute to the model. In step two, state guilt “no” was entered and did not show significant results. The second regression analysis was used to assess the ability of shame to predict levels of exercise identity. In step one trait shame was entered as a covariate and did not significantly contribute to the model. In step two, state shame “no” was entered and did not show significant results.

A regression analysis was used to assess the ability of guilt on a “no” day to predict strength of intentions to engage in future exercise (N=101). In step one, trait guilt was entered as a covariate and did not significantly contribute to the model. In step two, state guilt “no” was entered and did not show a significant association with strength of intentions to exercise. The second regression analysis was used to assess the ability of shame on a “no” day to predict strength of intentions to engage in future exercise. In step one trait shame was entered as a covariate and did not significantly contribute to the model. In step two, state shame “no” was entered and did not show significant results.

Finally, two logistic regressions were run to assess the ability of state guilt and shame on a “no” day to predict whether or not participants engaged in their next intended exercise session (N=97). In this case bivariate correlations were run prior to running the

model to assess potential covariates. First, the analysis was run to determine if past exercise behaviour was related to future exercise behaviour. The analysis did not show a significant relationship therefore the variable was left out of the final model. The second correlation analysis was conducted with trait guilt and shame and also found to not be significant. Therefore the final logistic models were run without any covariates; doing so allowed us to maximize the power of our analysis.

The first logistic regression was used to assess the ability of guilt on a “no” day to predict whether or not participants engaged in their next intended exercise session. The model was not significant.

The second logistic regression assessed the ability of shame on a “no” day to predict whether or not participants engaged in their next intended exercise session. Shame was found to be significant ( $p = .05$ ) with future exercise engagement and this relationship was negative in nature (Beta  $-0.11$ ). However the odds ratio of  $.895$ , 95% CI of the OR  $(.8, 1)$  indicates that it is not a very strong predictor.

*Table 2: Shame and Guilt Descriptives*

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>
Trait Guilt	175	65.09	7.29
Trait Shame	175	45.89	8.96
State Guilt (yes day)	135	6.21	2.59
State Shame (yes day)	135	5.72	1.71
State Guilt (no day)	100	10.79	4.32
State Shame (no day)	100	8.68	4.38

*Table: Relationship of Attribution Dimensions with State Guilt*

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b>Beta</b>	<b>t</b>	<b>Sig</b>
Locus of causality	.287	.088	.393	3.25	.002
External control	.167	.076	.229	2.2	.03
Stability	.007	.114	.006	.063	.95
Personal control	-.048	.07	-.085	-.693	.49

Notes:  $R^2 = .136$  ( $p = .02$ )

*Table 4: Relationship of Attribution Dimensions with State Shame*

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b>Beta</b>	<b>t</b>	<b>Sig</b>
Locus of causality	.145	.09	.196	1.611	.111
External control	.098	.077	.133	1.282	.203
Stability	.276	.114	.248	2.434	.017
Personal control	-.023	.07	-.041	-.336	.738

Notes:  $R^2 = .143$  ( $p = .01$ )

## **Chapter IV**

### **Discussion**

The purpose of this thesis was to contribute to the understanding of the role of guilt and shame in the self-regulation of exercise. To explore this purpose the experiences of guilt and shame immediately following a missed as well as an engaged in exercise session were examined. Further, to examine the motivational capacity of these emotions in the exercise context, the effect of a missed exercise session on strength of intentions and engagement in future exercise behaviour was measured. Finally, in recognition of the limited empirical work looking at these two emotions, the attributions associated with these emotions as well as the relationship of these emotions with exercise identity were

explored. This research is novel in that it is the first, to our knowledge, to measure and explore the acute, real-life experience and motivational qualities of guilt and shame, examined as separate constructs, in relation to exercise behaviour. Further it provides a test of propositions advanced by theories that identify negative emotions as being relevant to behavioural self-regulation.

### **The Experience of Guilt and Shame Related to Recent Exercise**

Participants' experience of guilt and shame relative to their recent exercise aligned with hypotheses. Participants reported higher levels of guilt and shame when they missed as opposed to when they engaged in an intended exercise session. Also when participants *did* engage in intended exercise, reported guilt and shame levels increased as their perceptions of the quality of this exercise (e.g. intensity and duration) decreased. These findings are consistent with Cybernetic Control theories. In general, this class of theories suggests that negative emotions (including guilt and shame) are the by-product of a person detecting a discrepancy between a current state and a desired state (Carver & Scheier, 1998). The higher levels of guilt and shame reported by participants when they missed rather than fulfilled an intended exercise session are consistent with this theoretical premise. These findings further suggest that it is not only whether a goal has been met in an absolute sense that has implications for affective responses; individuals appear to make subjective judgments about the quality of the goal-directed behaviour which also has implications for the experience of negative affect.

Negative affect resulting from failure at goal attainment has been demonstrated elsewhere in the health, and more specifically, exercise literature. An example of the former is research conducted by Castonguay et al. (2012). When female study

participants recognized a discrepancy in their ideal and actual body weight their response was an increase in negative affect, with larger discrepancies being associated with participants reporting more intense negative affect. This is consistent with findings within the exercise literature. In a study conducted by Strachan & Brawley (2008), participants considered a hypothetical scenario where their exercise level over the past three weeks had been much less than usual. Those with high exercise identity reported more negative affect than those with lower levels of identity. The researchers suggest that, compared to lower identity individuals, those reporting higher identity perceived a greater discrepancy between the reduced levels of exercise described in the scenario and their identity as an exerciser, and therefore reported more negative affect. Flora et al. (2012) report similar findings. Participants who identified as regular exercisers experienced negative affect in response to a scenario describing an exercise relapse over an extended period of time (one month). When considered along with past research, the present findings provide converging support for the Cybernetic Control precept that people experience negative affect when they fail to meet or progress towards a desired goal. Unique contributions of the present findings are that the negative affect experienced by people in relation to a single, real-life, missed exercise session can take the form of guilt and shame reactions.

### **The Motivational Properties of Guilt and Shame**

The hypotheses regarding the motivational outcomes of negative emotions were, for the most part, not supported. While Cybernetic Control theories predict that negative emotions (which capture both shame and guilt) should lead to motivation for and engagement in reparative behaviour, we advanced more refined and specific hypotheses for each emotion (shame and guilt) based on the self-conscious emotions literature. Based

on researchers' (i.e. Tracey & Robins, 2004) descriptions of the motivational qualities of the two emotions, guilt is recognized for its association with proactive direction (Tracey & Robins, 2004) and was hypothesized to motivate exercise behaviour (as captured by intentions for and actual engagement in exercise). Conversely, shame was hypothesized to lead to lack of motivation for these behaviours given this emotion's proposed association with separation and distance (Tracey & Robins, 2004). However, participants' levels of guilt and shame experienced relative to a missed but intended exercise session were not related to their intentions to exercise. Further, guilt did not relate to participants' reported engagement in their next intended exercise session. However shame did show a weak albeit significant negative relationship with subsequent intended exercise, which aligns with what was hypothesized.

The general pattern of findings that the negative emotions measured did not strongly relate to motivation for subsequent exercise (intentions) or engagement in reparative action (subsequent intended exercise) is at odds with a precept offered by the Cybernetic Control models. According to this class of theories, negative affect associated with goal frustration serves a motivational purpose. Specifically, when individuals experience this negative affect they will take reparative action so as to reinstate symmetry between a desired and actual state and, consequently, alleviate negative affect. Through playing this motivational role, negative affect is viewed by Cybernetic Control theories as being a functional and essential component of self-regulation.

The failure of the present research to demonstrate an association between negative affect and motivation for/engagement in reparative behaviour could be argued to challenge the central tenet of Cybernetic Control theories that negative affect plays an

adaptive role in self-regulation. Indeed, researchers such as Tice and colleagues (2001) and proponents of Self Determination Theory (Ryan & Deci, 2000) contend that negative emotion can be detrimental to successful self-regulation. However, there are a number of possible explanations for why the present findings do not align with this particular tenet of Cybernetic Control theories that preclude us from discarding this same tenet at this time.

First, levels of guilt and shame experienced by the participants following one missed intended exercise session may not have been of a sufficient magnitude to motivate participants to intend to take reparative action (as reflected by strength of intentions), or actually engage in, their next intended exercise session. The mean level of negative affect experienced by participants in this situation appears to represent mild levels of guilt and shame; out of a possible total score of 25, participants reported means of 10.77 and 8.75 for guilt and shame respectively. Although these levels of negative emotions appear to be relatively mild, it should be noted that the amount of shame and guilt that participants experienced when exercise was missed was significantly more than what was reported when participants did engage in intended exercise. It appears that the guilt and shame participants report experiencing following a missed exercise session represent levels that are slightly elevated in comparison to when no transgression has occurred. However, these mild levels of reported negative affect might not have been intense enough to provide the impetus for participants to take reparative action. While control theories do not identify a threshold of negative affect necessary for this affect to motivate reparative action, the theories do emphasize that the more intensely an emotion is experienced the

more powerful that emotion is from a motivational perspective (e.g., Burke & Stets, 2009; Folkman and Lazarus, 1985; Steele, 1999).

Secondly, an interesting contribution of this thesis is that it provided an opportunity to examine negative emotional responses to a single behavioural transgression and the *acute* effects of these emotions on subsequent self-regulation. This focus may not have captured the larger context of participants' recent exercise behaviour and this information may be important. For negative affect to exert a motivational influence it may require an accumulation of perceived goal frustration rather than a single missed session. Proponents of the control theories argue that *repeated* interruption to one's behaviour causes accumulating distress to the individual (Burke, 1991). The more frequent these interruptions, the more intense the negative feelings. If true, these higher levels of negative affect may have greater motivational power than the acute effects of a single missed session. This possibility is supported by other work looking at the motivational properties of negative affect. Flynn & Schaumberg (2012) concluded that as participants' experience of negative affect (namely guilt) became more intense they also became more motivated to adhere to work related tasks. More specific to the health literature, Hynie and colleagues (2006) found that higher levels of shame and guilt were found to motivate participants' intentions for condom use. In the case of the present study and the perspective it provides, the participants may not have experienced negative affect long enough to result in motivational behaviours. Nonetheless, the present findings provide important insight, not previously provided, into the extent to which a single behavioural transgression is associated (or not as is the present case) with motivation for and engagement in reparative behaviour.

Thirdly, while the real-life context of the present study provides external validity, the trade-off of this design may have occurred in terms of reduced internal validity. It is interesting that participants reported negative affect after admitting to a missed exercise session, yet these affective reactions did not relate to strength of intentions or engagement in subsequent intended exercise. Several exercise barriers could have come into play in peoples' lives to interfere with their ability to engage in a reparative exercise session. The effect of these barriers may have masked the motivating effects of the negative affect they experienced. Another interesting possibility is that participants may have been dealing with their goal frustration in ways other than through intended and actual behaviour. Individuals may have engaged in cognitive strategies to alleviate negative affect and found ways to reinterpret the negative affect that did not result in motivating reparative behaviour (Burke & Stets, 2009). For example, Cast and Burke (2002) argue that individuals with high self-esteem better cope with a self-behaviour discrepancy because their self-esteem acts as a "buffer" for the resulting negative affect. Often individuals with higher self-esteem will attribute negative situations to external factors and feel they still maintain control of the situation (Cast & Burke, 2002). In a post hoc analysis of participant attributions reported after a missed exercise session, the attribution characteristic that was reported most strongly was personal control (a mean of 15 out of a possible 27). For participants in this study, a single-missed exercise session, which participants attributed to something within their control, may not have been threatening enough to lead to the need for reparative action. While the present study did not measure self-esteem, future studies may want to account for moderators of the affect-motivation relationship such as self-esteem.

Lastly, a disproportionate number of participants followed a missed exercise session with an engaged-in exercise session; only 16 participants reported two consecutively missed exercise sessions. This disproportionate response trend left us underpowered to test our research questions that pertained to whether shame and guilt were associated with participants' reporting of engagement in subsequent intended exercise. Without adequate power, we cannot be confident in the validity of the relationships we found. The high number of participants who adhered to their exercise intentions was unpredicted and surprising given the well documented "intention-behaviour gap" in the health literature (Ajzen, 2011). This propensity to adhere may be a reflection of the type of participants we had in the study (past experience with at least minimal exercise) or the demand characteristics of our study design (i.e. knowledge that physical activity behaviour was being assessed). Further, in order to know when to follow-up with participants to see if they had engaged in their next intended exercise session participants were asked when they next intended to exercise – so inadvertently, participants were instructed to make future exercise plans. Making future exercise plans has been shown to increase adherence (Fleig, Pomp, Parschau, Barz, Lange, Schwarzer, Lippke, 2012) and this necessary design feature may have had a motivating effect and contributed to the high number of participants who acted on their exercise intentions. It should be noted however that stating when one next intended to exercise did not always result in participants engaging in exercise; over half of the participants (58% of the total sample) reported missing an exercise session even after stating when they next intended to exercise on at least one occasion.

While the majority of our hypotheses relating to the motivational properties of shame and guilt were not supported, there was one exception. As hypothesized, shame demonstrated a negative (albeit weak) relationship with engagement in subsequent intended exercise. As participants' levels of shame associated with a missed exercise session increased, the likelihood of participants reporting having engaged in their next intended exercise session decreased. This finding is in line with the idea that shame results in individuals separating and distancing themselves from the negative situation (Tangney, 2003). It is possible that participants' may have failed to engage in an intended exercise session as a means of dissociating from a failure situation. While a relationship between shame and exercise disengagement was found, we must be cautious. The relationship was significant, however the analysis presented a weak effect and was underpowered. Nonetheless, this study was the first to explore the motivational properties of shame in the exercise context and the present finding is consistent with those offered by past researchers exploring the motivational properties of shame in domains other than exercise. In their 2011 study, Yi & Baumgartner found that in the context of impulse shopping behaviours, shame resulted in avoidant coping strategies (whereas guilt resulted in problem solving coping strategies). While these findings are consistent with the idea that shame may lead to avoidance, it should be noted that researchers exploring the motivational effects of shame propose that differing behaviours may result in differing motivational outcomes (de Hooge, Zeelenberg, & Breugelmans, 2010). de Hooge and colleagues (2010) recommend further research exploring shame's influence in various behavioural domains to assess its potential in eliciting different outcomes. The inconsistency of potential outcomes of shame speaks to the well-established notion that

these emotions are complex, internal and difficult to measure (Tangney, 2003). Exploring the uniqueness of the self-conscious emotions offers further insight into the complexities of negative emotions that is not provided by the Cybernetic Control models.

### **Self-Conscious Emotions**

In addition to the Cybernetic Control theories, this thesis was informed and some research questions were driven by the emerging literature on self-conscious emotions (i.e. Sabiston et al., 2010; Tangney & Dearing, 2002). The self-regulatory functions attributed to these emotions make them particularly suitable to study in relation to the role of affect in the self-regulation of exercise. Guilt and shame are argued to be unique, separate emotions (Tangney, 1996) and have the capabilities to guide behavior (Tangney, 2003). Most relevant to the purposes of this thesis, guilt and shame are thought to play the largest role in physical activity self-regulation (Sabiston et al., 2010).

In this thesis, as hypothesized, participants reported experiencing guilt more strongly than shame following a missed exercise session. This finding is in line with a distinction that theorists of self-conscious emotions advance about guilt and shame. Guilt is theorized to be experienced in reaction to a transgression related to a specific *behaviour* whereas shame is felt when the transgression pertains to the *self* (Lewis, 1971). Participants' experience of higher levels of guilt as compared to shame was expected given that, for most participants, missing an exercise session should represent a behavioural transgression (exercise is a behaviour) more so than a transgression affecting the global self (Lewis, 1971). The finding of greater guilt than shame being experienced is consistent with past empirical work measuring the two emotions in reaction to a behaviour discrepancy in other behavioural domains (e.g. Hynie et al., 2006; Lindsey,

2005). Empirical work measuring guilt and shame in the context of physical activity is very limited and the present study builds on the only other study within the literature to measure these concepts (Sabiston et al., 2010). Sabiston and colleagues (2010) measured guilt and shame in relation to the body and found higher levels of shame experienced when the self was the focus of evaluation. The present study was the first to look at the relationship between real-life physical activity adherence and the resulting levels of guilt and shame. This particular finding – that guilt was experienced more strongly than shame – supports the idea that these emotions are experienced as unique separate emotions.

Offering further support for the unique differences of the two emotions are their associated antecedents. According to the attributions literature the experience of guilt should be elicited when an event is viewed as controllable, unstable and internal (e.g., lack of effort) whereas shame would be elicited when the event is viewed as uncontrollable, stable, and internal (e.g., lack of ability; Weiner, 1985). In the present study guilt was associated with internal locus of causality (but not with controllability and stability) as hypothesized. That is, people's guilt related to a missed exercise session was positively related to the extent to which they saw the cause of the missed session as being something to do with them. Given that controllability and stability did not emerge as significant correlates of guilt it is difficult to speculate on the type of internal cause to which participants may be attributing their missed exercise session. In contrast, the experience of shame was associated with participants attributing the cause of the missed exercise session to something uncontrollable and stable which is consistent with attributions speculated to associate with shame. However, it is surprising that internality did not emerge as a significant correlate of shame given that shame, like guilt, is a self-

conscious emotion and so should involve attributing failure to something internal (Lewis, 1971). It should be noted that the items used to assess the attribution dimension of stability in the present sample were not highly reliable (alpha of .598) so caution should be used in interpreting its effects. The finding that guilt and shame were associated with different attribution dimensions offers further support for the unique qualities of the two emotions.

Finally, and as previously discussed, shame and guilt were differently related to exercise behaviour (but not intentions); shame about a missed exercise session was positively associated with an increased likelihood of participants reporting having not engaged in their next intended exercise session while guilt did not relate in this situation. When considered in aggregate, relationships involving shame and guilt in this thesis often played out differently for each emotion, which suggests that shame and guilt are unique.

However, when considered from a statistical standpoint, our findings point to these variables having substantial overlap; these emotions were highly correlated and difficult to separate. In fact, owing to the extensive shared variance between these emotions, we were not able to create the variables of shame-free guilt and guilt-free shame. It is not surprising that there were some difficulties separating the two as it has only been until fairly recently that they have begun to be viewed as separate emotions (Lewis, 1971). Researchers exploring these emotions should be open to the possibility that the two may be interrelated. The fact that some of our findings support differences between guilt and shame while others suggest their similarity may strengthen the need for future research exploring these emotions within the exercise domain in order to further inform the nature of their relationship.

## **Exercise Identity**

Exercise identity was examined as a variable that might influence the strength of affective reactions that participants experience in response to a missed exercise session. Contrary to hypothesis, no relationship was found between participants' levels of exercise identity and levels of negative affect. According to the specific Cybernetic Control Theory, Identity Theory, negative emotions result when situational meanings are not consistent with the individual's identity (Stryker & Burke, 2009). Past research offers support that individuals with strong identities experience more intense negative emotional reactions when they perceive identity-behaviour inconsistency (Burke & Stets, 2009). In the exercise context, Strachan et al. (2009) found that exercise identity moderated the relationship between perceptions of identity-behaviour consistency and negative affect. Further, Flora and colleagues (2012) found that in response to a vignette describing exercise relapse, exercise identity significantly predicted shame and guilt. It is somewhat surprising that the present findings were not in line with past research; however we offer possible explanations for these contradicting results.

One possible explanation, and as previously discussed, the study design may not have been conducive to eliciting enough negative emotion; simply missing one exercise session may not result in a threat to identity verification. Theory and past research support the notion that *exercise relapse* motivates reparative behaviour (Burke & Stets, 2009; Flora et al., 2012). Exercise relapse is defined as the return to sedentary life after an individual completely abandons exercise (Lox, Martin-Ginis & Petruzzello, 2010). The present study design was not set up to reflect these characteristics. The two exercise studies that did assess a relationship between exercise identity and negative affect

involved an identity threat from exercise behaviour over a one month time period (Flora et al., 2012; Strachan et al., 2009). Therefore, the present study offers support for the idea that a threat to exercise identity verification only occurs after a prolonged period of time and the acute effects of one missed exercise session may not pose a large enough threat to individuals to create an identity threat.

### **Study Strengths**

There are several noteworthy strengths of this thesis. A first strength is that the research questions were founded within Cybernetic Control theory and the framework provided by the self-conscious emotions literature. With reference to the former, the study findings offer advancements. The majority of research utilizing Cybernetic models assesses *general* negative affect. As Forgas (2000) describes, affect may be too general a concept to be useful, especially for exploring its role in self-regulation. Our findings adhere to recommendations to investigate specific emotional reactions and their relationship with behaviour (e.g., Stets & Burke, 2005). Through this study, we were, to our knowledge, among the first to explore the nature of the experience of guilt and shame within the exercise context and the first to explore the motivational properties of these emotions as proposed by the Cybernetic theorists. Furthermore, these findings were gathered in the context of the real-life experience of a missed exercise session; this context provides an alternative test of emotional reactions to exercise behaviour than has often been provided through research employing participants' reactions to hypothetical vignettes. Also, this study provides the first examination of participants' emotional reactions to a single exercise session and looked at the acute effect of a discrepancy

between intended and engaged-in behaviour, whereas past studies measured the emotional reactions to general recent physical activity behaviour (e.g. over the past month). By assessing reactions to a single exercise session, this thesis provides insights into whether, and to what extent, negative emotions associated with a single behavioural transgression exist and exert a motivational influence on subsequent behaviour

This research adhered to many methodological recommendations outlined within the self-conscious emotions literature. As recommended, we measured trait levels of shame and guilt so that their possible influence could be considered and, if necessary, accounted for given their proposed relationship with the state counterpart of these emotions. Further, steps were taken in measurement, data management, and analyses to respect the proposed notion that state guilt and shame are separable constructs. By doing so, the findings contributed to a more in depth understanding of what types, and at what intensity negative emotions may be felt in reaction to incongruent behaviour. Furthermore, in treating these emotions separately, we provide findings that help assist in confirming the recently advanced notion that shame and guilt are unique constructs (Lewis, 1971).

Finally, a further strength of this thesis is that through sampling from a community sample the findings can be generalized beyond the commonly captured university student population and therefore may be more representative than some past research.

### **Study Limitations and Future Considerations**

The limitations of this thesis should be noted to guide future research on exercise and self-conscious emotions. There were a few methodological constraints that were limiting. Namely, participants' emotional reactions to a single-missed exercise session were assessed and this short period of time may not have been sufficient in gathering strong enough affective responses in order to support some of our hypotheses. Following participants for a longer duration would offer opportunities not afforded by the present study design. For example, such a design would provide an opportunity to consider whether guilt and shame reactions differ in their intensity and motivational properties when they take into account the broader perspective of one's general recent exercise (i.e. how people react to several bouts of missed or engaged in exercise) as opposed to a single session.

To provide this perspective in future research, researchers should consider different methodological designs. One method that has been found to be useful within psychological research is the computerized Experience-Sampling Method (ESM; Csikszentmihalyi & Larson, 1987). ESM would allow the researcher to capture participants' exercise behaviours and associated emotional reactions over an extended period of time (e.g. a week or a month) and would also allow the researcher to capture variations in emotions throughout the day and directly following a particular behaviour (in this case, missed or engaged in exercise). As previously mentioned, making future exercise plans has been shown to increase adherence (Fleig et al., 2012). ESM allows researchers to simply monitor behaviours without relying on participants to set their future plans. With respect to the monitoring inherent to EMS, it has been shown that

participant reactivity due to being monitored is not an important threat to validity when assessing free-living physical activity (Matevey, Rogers, Dawson, & Tudor-Locke, 2006). The use of the online survey system employed in this study allowed for increased accessibility for participants but limited the amount of control over when the participant's responded to the questionnaires, and realistically participants may not have logged onto the study site and respond to the questionnaires until the following day. This may have affected the strength of the emotional reactions reported in the questionnaires. EMS has been shown to be an effective tool in gathering affective states in a variety of domains including work, school and even sleeping and dreaming (Hektner, Schmidt, & Csikszentmihaly, 2007).

Additionally, a qualitative methodological approach would complement the current research through providing a means of attaining a rich understanding of the experience of guilt and shame in the context of exercise. Qualitative research allows researchers to explore the socially constructed nature of emotions (Denzin & Lincoln, 1994). This approach may provide insight into the experiences of guilt and shame not captured to date by quantitative measures. For example, a qualitative follow-up to this study could explore, in detail, some of the offerings of this thesis. Through qualitative methods such as interviews or focus groups, participants could provide their perspective on when their exercise behaviour may have led to shame and guilt, whether these emotions are experienced as similar or unique and what effect, if any, they feel these emotions have on the self-management of their behaviour.

Over 80% of the participants in this study identified themselves as Caucasian which limits the generalizability of the present findings. The reason for this high

prevalence of a single racial group is not known. However, the majority of Manitoban's self-identify as Caucasian (Statistics Canada, 2006) so the high prevalence of Caucasian people in this largely Manitoba based study is a likely rationale. Additionally, dominant groups may have been overrepresented in the centers where the study was advertised, making them more likely to respond. However, current research indicates that *dominant* or *majority* racial and cultural groups may be more likely to participate in physical activity health promotion initiatives (King, Castro, Eyler, Wilcox, Sallis, & Brownson, 2000). In contrast, those that lie on the outskirts and periphery of mainstream racial and cultural groups may be less likely to participate, and face ethnic and cultural barriers to participation. As well, physical activity initiatives may fail to capture the unique needs of particular racial, ethnic, and cultural groups (King et al., 2000). In the future, it is important that online research on shame and guilt in exercisers display the cultural sensitivity needed to attract participants from diverse backgrounds.

Another limitation in the present study was the low number of people ( $n = 16$ ) who followed a missed exercise session with another missed exercise session. This left us underpowered for our planned analyses. Future research should seek a sufficient sample size in order to provide a more definitive test of this particular research. Researchers may have to sample a large number of participants in order to encounter enough people who follow a missed exercise session with another missed session.

### **Conclusions**

Through this thesis, we offer numerous contributions to both the literature pertaining to Cybernetic Control theories as well as the self-conscious emotions. This

thesis has explored a number of the antecedents and outcomes related to the experience of guilt and shame. The two self-conscious emotions have both shown to be experienced in the presence of behaviour discrepancy, with guilt having slightly elevated levels over shame. However, at this time we cannot conclusively report on their motivational properties. We can (cautiously) conclude that the experience of shame may lead to disengagement from exercise (at least in the short term). However in light of the findings within other behavioural domains which are similar to the present findings health promotion strategies should be aware of the messages being portrayed to the public in order to increase exercise adherence.

There is a recognized need to increase physical activity participation and adherence (Kahn et al., 2002) and historically research within the field of health and exercise psychology has focused on cognitive approaches. In order to properly construct and target health promotion messaging researchers have called for a focus that moves beyond cognition to one that includes affective and emotional states and their influence on exercise (Ekkekakis, Hargreaves, & Parfitt, 2013). The questions proposed in this thesis adhere to this call and shed some light on the characteristics of guilt and shame in the context of exercise adherence. Future research should further explore these complex emotions to gain a better understanding of their impact on exercise adherence. The ideas presented in this thesis may help us to better understand negative emotions and their role in exercise self-regulation. This knowledge may aid future directions in health psychology research and in shaping health promotion techniques.

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## Appendix A: Baseline Measures

### Measure 1: Demographic Measures

1. Please indicate your gender.  
 Male  
 Female
2. Please tell us your age
3. How did you hear about the study?
  - a. Through Facebook
  - b. Email
  - c. University of Manitoba advertisement
  - d. Community advertisement
  - e. Other
4. Please indicate your cultural background.
  - a. Caucasian
  - b. Aboriginal
  - c. Hispanic
  - d. African American
  - e. Asian
  - f. Other
5. Please indicate your marital status.
  - a. Single
  - b. Common-law
  - c. Married
  - d. Separated
  - e. Divorced
6. What is the highest level of education that you have completed?
  - a. Elementary
  - b. Secondary
  - c. College/vocational school
  - d. University
  - e. Postgraduate
7. What is your current employment situation?
  - a. Stay at home parent
  - b. Student
  - c. Employed full time
  - d. Employed part time

- e. Unemployed and not in school
- f. Retired

8. Please indicate the province or territory in which you live.
- a. Yukon Territory
  - b. Saskatchewan
  - c. Quebec
  - d. Ontario
  - e. NW Territories
  - f. Nova Scotia
  - g. Newfoundland
  - h. New Brunswick
  - i. Manitoba
  - j. British Columbia
  - k. Alberta

9a. Considering the past 7-day period (a week), how many times on the average did you do STRENUOUS EXERCISE (heart beats rapidly, i.e. running, jogging, hockey, football, soccer) for more than 15 minutes during your free time?

\_\_\_\_\_

9b. On average, how long were these sessions (in minutes)?

\_\_\_\_\_

10a. Considering the past 7-day period (a week), how many times on the average did you do MODERATE EXERCISE (not exhausting i.e. fast walking, baseball, tennis, easy bicycling) for more than 15 minutes during your free time?

\_\_\_\_\_

10b. On average, how long were these sessions (in minutes)?

\_\_\_\_\_

11a. Considering the past 7-day period (a week), how many times on the average did you do MILD EXERCISE (minimal effort i.e. yoga, archery, fishing, bowling) for more than 15 minutes during your free time?

\_\_\_\_\_

11b. On average, how long were these sessions (in minutes)?

\_\_\_\_\_

## Measure 2: Test of Self Conscious Affect

Below are situations that people are likely to encounter in day-to-day life, followed by several common reactions to those situations.

As you read each scenario, try to imagine yourself in that situation. Then indicate how likely you would be to react in each of the ways described. We ask you to rate all responses because people may feel or react more than one way to the same situation, or they may react different ways at different times.

Please do not skip any items -- rate all responses.

### 1. You make plans to meet a friend for lunch. At 5 o'clock, you realize you stood your friend up.

- |  | Not likely        | Very likely |
|--|-------------------|-------------|
| a) You would think: "I'm inconsiderate."                                 | 1---2---3---4---5 |             |
| b) You would think: "Well, my friend will understand."                   | 1---2---3---4---5 |             |
| c) You'd think you should make it up to your friend as soon as possible. | 1---2---3---4---5 |             |
| d) You would think: "My boss distracted me just before lunch".           | 1---2---3---4---5 |             |

### 2. You break something at work and then hide it.

- |  | Not likely        | Very likely |
|--|-------------------|-------------|
| a) You would think: "This is making me anxious. I need to either fix it or get someone else to." | 1---2---3---4---5 |             |
| b) You would think about quitting.   | 1---2---3---4---5 |             |
| c) You would think: "A lot of things aren't made very well these days."                          | 1---2---3---4---5 |             |
| d) You would think: "It was only an accident."   | 1---2---3---4---5 |             |

3. You are out with friends one evening, and you're feeling especially witty and attractive. Your best friend's spouse seems to particularly enjoy your company.

**Not likely**                      **Very likely**

- a) You would think: "I should have been aware of what my best friend was feeling."  
1---2---3---4---5
- b) You would feel happy with your appearance and personality.  
1---2---3---4---5
- c) You would feel pleased to have made such a good impression.  
1---2---3---4---5
- d) You would think your best friend should pay attention to his/her spouse.  
1---2---3---4---5
- e) You would probably avoid eye contact.  
1---2---3---4---5

4. At work, you wait until the last minute to plan a project, and it turns out badly.

**Not likely**                      **Very likely**

- a) You would feel incompetent.  
1---2---3---4---5
- b) You would think: "There are never enough hours in the day."  
1---2---3---4---5
- c) You would feel: "I deserve to be reprimanded for mismanaging the project."  
1---2---3---4---5
- d) You would think: "What's done is done."  
1---2---3---4---5

5. You make a mistake at work and find out a co-worker is blamed for the error.

**Not likely**                      **Very likely**

- a) You would think the company did not like the co-worker.  
1---2---3---4---5
- b) You would think: "Life is not fair."  
1---2---3---4---5
- c) You would keep quiet and avoid the co-worker.  
1---2---3---4---5

d) You would feel unhappy and eager to correct the situation.

1---2---3---4---5

6. For several days you put off making a difficult phone call. At the last minute you make the call and are able to manipulate the conversation so that all goes well.

**Not likely**

**Very likely**

a) You would think: "I guess I'm more persuasive than I thought".

1---2---3---4---5

b) You would regret that you put it off.

1---2---3---4---5

c) You would feel like a coward.

1---2---3---4---5

d) You would think: "I did a good job".

1---2---3---4---5

e) You would think you shouldn't have to make calls you feel pressured into.

1---2---3---4---5

7. While playing around, you throw a ball and it hits your friend in the face.

**Not likely**

**Very likely**

a) You would feel inadequate that you can't even throw a ball.

1---2---3---4---5

b) You would think maybe your friend needs more practice at catching

1---2---3---4---5

c) You would think: "It was just an accident."

1---2---3---4---5

d) You would apologize and make sure your friend feels better.

1---2---3---4---5

8. You have recently moved away from your family, and everyone has been very helpful. A few times you needed to borrow money, but you paid it back as soon as you could.

**Not likely**

**Very likely**

a) You would feel immature.

1---2---3---4---5

b) You would think: "I sure ran into some bad luck."

1---2---3---4---5

c) You would return the favor as quickly as you could.

1---2---3---4---5

- d) You would think: "I am a trustworthy person."  
1---2---3---4---5
- e) You would be proud that you repaid your debts.  
1---2---3---4---5

9. You are driving down the road, and you hit a small animal.

- |   | <b>Not likely</b> | <b>Very likely</b> |
|---|-------------------|--------------------|
| a) You would think the animal shouldn't have been on the road.      | 1---2---3---4---5 |                    |
| b) You would think: "I'm terrible."                                 | 1---2---3---4---5 |                    |
| c) You would feel: "Well, it was an accident."                      | 1---2---3---4---5 |                    |
| d) You'd feel bad you hadn't been more alert driving down the road. | 1---2---3---4---5 |                    |

10. You walk out of an exam thinking you did extremely well. Then you find out you did poorly.

- |   | <b>Not likely</b> | <b>Very likely</b> |
|---|-------------------|--------------------|
| a) You would think: "Well, it's just a test."         | 1---2---3---4---5 |                    |
| b) You would think: "The instructor doesn't like me." | 1---2---3---4---5 |                    |
| c) You would think: "I should have studied harder."   | 1---2---3---4---5 |                    |
| d) You would feel stupid.                             | 1---2---3---4---5 |                    |

11. You and a group of coworkers worked very hard on a project. Your boss singles you out for a bonus because the project was such a success.

**Not likely**                      **Very likely**

- a) You would feel the boss is rather short-sighted.  
1---2---3---4---5
- b) You would feel alone and apart from your colleagues.  
1---2---3---4---5
- c) You would feel your hard work paid off.  
1---2---3---4---5
- d) You would feel competent and proud of yourself.  
1---2---3---4---5
- e) You would feel you should not accept it.  
1---2---3---4---5

12. While out with a group of friends, you make fun of a friend who's not there.

**Not likely**                      **Very likely**

- a) You would think: "It was all in fun; it's harmless."  
1---2---3---4---5
- b) You would feel small...like a rat.  
1---2---3---4---5
- c) You would think that perhaps that friend should  
have been there to defend himself/herself.  
1---2---3---4---5
- d) You would apologize and talk about that person's good points.  
1---2---3---4---5

13. You make a big mistake on an important project at work. People were depending on you, and your boss criticizes you.

**Not likely**                      **Very likely**

- a) You would think your boss should have been more clear about what  
was expected of you.  
1---2---3---4---5

- b) You would feel like you wanted to hide. 1---2---3---4---5
- c) You would think: "I should have recognized the problem and done a better job." 1---2---3---4---5
- d) You would think: "Well, nobody's perfect." 1---2---3---4---5

14. You volunteer to help with the local Special Olympics for handicapped children. It turns out to be frustrating and time-consuming work. You think seriously about quitting, but then you see how happy the kids are.

**Not likely**                      **Very likely**

- a) You would feel selfish. And you'd think you are basically lazy. 1---2---3---4---5
- b) You would feel you were forced into doing something you did not want to do. 1---2---3---4---5
- c) You would think: "I should be more concerned about people who are less fortunate." 1---2---3---4---5
- d) You would feel great that you had helped others. 1---2---3---4---5
- e) You would feel very satisfied with yourself. 1---2---3---4---5

15. You are taking care of your friend's dog while they are on vacation and the dog runs away.

**Not likely**                      **Very likely**

- a) You would think, "I am irresponsible and incompetent." 1---2---3---4---5
- b) You would think your friend must not take very good care of their dog or it wouldn't have run away. 1---2---3---4---5
- c) You would vow to be more careful next time. 1---2---3---4---5

d) You would think your friend could just get a new dog.

1---2---3---4---5

16. You attend your co-worker's housewarming party and you spill red wine on a new cream-colored carpet, but you think no one notices.

**Not likely**

**Very likely**

a) You think your co-worker should have expected some accidents at such a big party.

1---2---3---4---5

b) You would stay late to help clean up the stain after the party.

1---2---3---4---5

c) You would wish you were anywhere but at the party.

1---2---3---4---5

d) You would wonder why your co-worker chose to serve red wine with the new light carpet.

1---2---3---4---5

### Measure 3: Exercise Identity Scale

**INSTRUCTIONS: PLEASE READ CAREFULLY:** Use the scale provided to rate extent to which each item applies to you.

<b>1. I consider myself an exerciser</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>2. When I describe myself to others, I usually include my involvement in exercise.</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>3. I have numerous goals related to exercising</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>4. Exercise is a central factor to my self-concept</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>5. I need to exercise to feel good about myself</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>6. Others see me as someone who exercises regularly</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7

<b>7. For me, being an exerciser means more than just exercising</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>8. I would feel a real loss if I were forced to give up exercising</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7
<b>9. Exercising is something I think about often</b>						
STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7

## Appendix B: Measures of Reactions to Exercise

### Measure 1: Physical Activity Intentions Questionnaire

1. Please indicate when you next intend to exercise for a minimum of 15 minutes  
(during your free time) \_\_\_\_\_
2. How strongly do you feel you will engage in this intended exercise session?

Please **circle** the number that best represents the strength of your intentions  
(1 – 9)

**Definitely will  
NOT engage in  
physical activity**

**Definitely will  
engage in  
physical activity**

1      2      3      4      5      6      7      8      9

## Measure 2: State Shame and Guilt Scale

The following are some statements which may or may not describe how you are feeling *right now*. Please think about how you feel regarding your **MISSED** or **ENGAGED IN** exercise session today and rate each statement using the 5-point scale below.

	Not feeling this way at all	Feeling this way somewhat	Feeling this way very strongly
1. I feel good about myself	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
2. I want to sink into the floor and disappear	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
3. I feel remorse, regret	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
4. I feel worthwhile, valuable	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
5. I feel small	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
6. I feel tension about something I have done	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
7. I feel capable, useful	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
8. I feel like I am a bad person	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
9. I cannot stop thinking about something bad I have done	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
10. I feel proud	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
11. I feel humiliated, disgraced	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
12. I feel like apologizing, confessing	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
13. I feel please about something I have done	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
14. I feel worthless, powerless	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5
15. I feel bad about something I have done	1 - - - - -	2 - - - - -	3 - - - - - 4 - - - - - 5

### Measure 3: The Causal Dimension Scale II

Think of the reason or reasons you have not exercised today. The items below concern your impressions or opinions of this cause or causes of your performance. Circle one number for each of the following scales.

Is the cause(s) something that:

- |  |   |   |   |   |   |   |   |   |   |                                     |
|--|---|---|---|---|---|---|---|---|---|-------------------------------------|
| 1. That reflects an aspect of yourself | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Reflects an aspect of the situation |
| 2. Manageable by you                   | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Not manageable by you               |
| 3. Permanent                           | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Temporary                           |
| 4. You can regulate                    | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | You cannot regulate                 |
| 5. Over which others have control      | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Over with others have no control    |
| 6. Inside of you                       | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Outside of you                      |
| 7. Stable over time                    | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Variable over time                  |
| 8. Under the power of other people     | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Not under the power of other people |
| 9. Something about you                 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Something about others              |
| 10. Over which you have power          | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Over which you have no power        |
| 11. Unchangeable                       | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Changeable                          |
| 12. Other people can regulate          | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Other people cannot regulate        |

**Measure 4: Assessment of Exercise Quality**

Based on your last exercise session please rate how you feel your level of satisfaction on both the duration and intensity of your workout

**1. Intensity**

Not Satisfied At All	Completely Satisfied
-------------------------	-------------------------

1 - - - - 2 - - - - 3 - - - - 4 - - - - 5 - - - - 6 - - - - 7 - - - - 8 - - - - 9 - - - - 10

**2. Duration**

Not Satisfied At All	Completely Satisfied
-------------------------	-------------------------

1 - - - - 2 - - - - 3 - - - - 4 - - - - 5 - - - - 6 - - - - 7 - - - - 8 - - - - 9 - - - - 10

## Appendix C: Repeated Measures

### Measure 1: The Godin Leisure Time Exercise Questionnaire Participant Eligibility

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

**TIMES PER WEEK**

**a) STRENUOUS EXERCISE** \_\_\_\_\_

(HEART BEATS RAPIDLY)

(i.e. running, jogging, hockey, football, soccer)

**b) MODERATE EXERCISE** \_\_\_\_\_

(NOT EXHAUSTING)

(i.e. fast walking, baseball, tennis, easy bicycling)

**c) MILD EXERCISE** \_\_\_\_\_

(MINIMAL EFFORT)

(i.e. yoga, archery, fishing, bowling)

2. Considering the **next 21 days** (three weeks), how many times on the average do you intend to engage in following kinds of exercise for **more than 15 minutes** during your **free time** (write on each line the appropriate number)

**TIMES PER WEEK**

**a) STRENUOUS EXERCISE** \_\_\_\_\_

(HEART BEATS RAPIDLY)

(i.e. running, jogging, hockey, football, soccer)

**b) MODERATE EXERCISE** \_\_\_\_\_

(NOT EXHAUSTING)

(i.e. fast walking, baseball, tennis, easy bicycling)

**c) MILD EXERCISE** \_\_\_\_\_

(MINIMAL EFFORT)

(i.e. yoga, archery, fishing, bowling)

**Measure 2: The Godin Leisure Time Exercise Questionnaire**

1. Considering the **past day**, on average how long did you engage in the following type of exercise for **more than 15 minutes** during your **free time** (write on each line the appropriate number)

**a) STRENUOUS EXERCISE**

(HEART BEATS RAPIDLY)

(i.e. running, jogging, hockey, football, soccer)

\_\_\_\_\_

**b) MODERATE EXERCISE**

(NOT EXHAUSTING)

(i.e. fast walking, baseball, tennis, easy bicycling)

\_\_\_\_\_

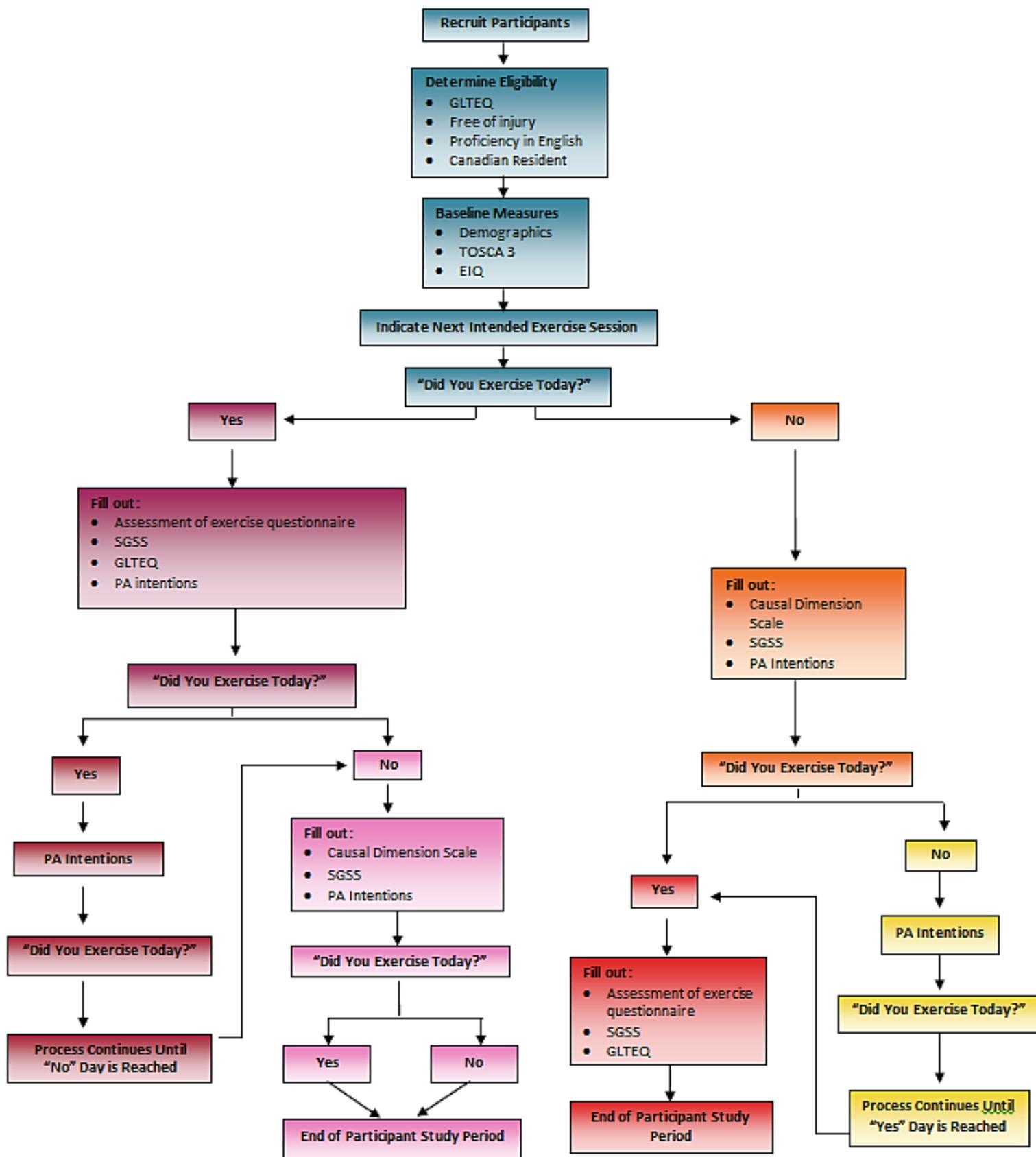
**c) MILD EXERCISE**

(MINIMAL EFFORT)

(i.e. yoga, archery, fishing, bowling)

\_\_\_\_\_

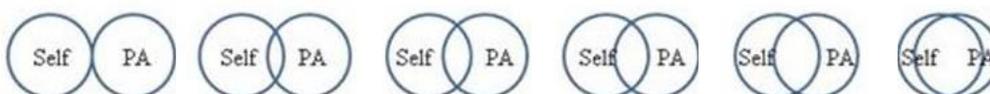
## Appendix D: Study Procedures





## Appendix F: Eligibility Requirements

1. Please indicate your age
  - a. Over 64
  - b. 18-24
  - c. 25-50
  - d. 51-64
2. Is your health status such that you are able to participate in physical activity (free of any injury/health conditions)?
  - a. Yes
  - b. No
3. Are you comfortable reading and writing English?
  - a. Yes
  - b. No
4. Do you have good comprehension of the English language?
  - a. Yes
  - b. No
5. Is anyone else in your household a participant in this study?
  - a. Yes
  - b. No
6. Where do you live?
  - a. Canada
  - b. Country other than Canada
7. Consider the past seven day period, how many times did you engage in physical activity for more than 15 minutes during your free time
  - a. 0
  - b. 1-5
  - c. More than 5
8. Considering the next three weeks, how many times per week on the average do you intend to engage in physical activity for more than 15 minutes in your free time?
  - a. 0
  - b. 1-5
  - c. More than 5
9. Please select the pairs of circles below which best describe your relationship (SELF) with physical activity (PA)



## Appendix G: Informed Consent

You have just completed the eligibility screening. We are pleased to inform you that you are eligible to participate in the study! Below is the consent form containing important information about the study. It is important that you indicate your consent at the bottom.

**This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.**

### Principal Investigator

Laura Meade, University of Manitoba, Faculty of Kinesiology and Recreation Management  
(204) 474-7878  
expsych@umanitoba.ca

### Research Supervisor

Dr. Shaelyn Strachan, University of Manitoba, Faculty of Kinesiology and Recreation Management  
(204) 474-6363

**Invitation to Participate:** You are invited to participate in the research study conducted by Laura Meade.

**Purpose of the Study:** The purpose of this study is to collect information on the role of emotions in the self-regulation of physical activity behaviours.

**Participation:** Your participation will consist of completing online questionnaires and reporting on your physical activity behaviour for a maximum of three weeks.

**Risks:** Your participation in this study will involve the disclosure of personal information, for example your age, gender, and marital status and this may cause you to feel slightly uneasy. However, it is acknowledged that all of the information provided will be kept in strict confidence, and no one other than the researchers will be able to trace your answers back to you.

Physical activity is a component of this study. Participating in physical activity may, for some people, lead to temporary physical responses such as muscular discomfort or fatigue. Furthermore, physical activity may aggravate underlying medical conditions.

A final risk is that the time commitment (multiple time points over a maximum of three weeks) may be an inconvenience for some participants.

These risks associated with this study are not expected to surpass the risks associated with daily life.

**Benefits:** You may be helping to contribute to the understanding of factors that influence physical activity participation and adherence. If you are interested, you can ask for the study results once they are available. Finally, you may also learn more about physical activity. It should be noted that these benefits are not guaranteed.

**Confidentiality and anonymity:** If you participate in this study, the information that you share will remain strictly confidential. Your information and data will only be used to examine the research questions of this study. Also, the principal researcher or the research assistant will merge your data with that of the other participants and once the data analyses have been completed and the project is finished, your contact information will be dissociated from your responses. Aggregated data stemming from this research will be presented in the principal investigator's master's thesis and may be presented at academic conferences and/or published in academic journals. Your contact information responses will be kept on a password-protected computer in the principal investigator's locked lab. Any hard copies of your data will be kept in a locked filing cabinet in the principal investigator's locked lab as well. Neither your name nor contact information will appear in any publications stemming from this research.

**Conservation of data:** As explained above, the electronic data will be stored on the principal researcher's password-protected computer and on a USB mass storage device in her locked lab. The USB key will also be kept in a locked filing cabinet in her lab, as will any hard copies of the data. When the project will be completed, the electronic data files stored on the computer will be destroyed. The USB mass storage device with original data and any hard copies of this data will then be stored in a locked filing cabinet in the researcher supervisor's locked office for five years. After this five-year period (approximately December 2018) all electronic data will be permanently deleted and any hard copies will be cross-shredded.

**Compensation:** This study includes multiple follow-ups that ask you to reflect on your physical activity behaviour. If you only complete the first follow up you will be compensated with a \$5 gift card to Amazon.com. If you complete the second follow up you will be compensated with \$10 gift card to Amazon.com. If you complete the study you will be fully compensated with a gift card of \$15 to Amazon.com. At the end of the study you will be asked to provide the email address that you would like this gift card sent to. Your email address will be shared by the principal investigator with the third party (Amazon.com). If you prefer not to receive the gift card, please let the principal investigator, Laura Meade know at [\(204\) 474-7878](tel:2044747878).

**Voluntary Participation:** You are under no obligation to participate and if you choose to participate, you can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If you wish to withdraw from the study you can contact the researcher at [expsych@umanitoba.ca](mailto:expsych@umanitoba.ca). If you choose to withdraw, you can ask that all of your data gathered until the time of withdrawal be deleted from computer files and the USB mass storage device, for hard copies to be

cross-shredded, and for none of your data to be used in data analyses. If you withdraw from the study, you will receive a prorated gift card as outlined above.

**Debriefing:** At the end of the study you will be debriefed on the study details. At the end of the study you will be provided with the opportunity to leave your contact information and, when available (approximately March 2014), a summary of results will be emailed to you, if you so wish.

**Research Dissemination:** For dissemination all data will be presented in aggregate form and neither your name nor contact information will appear in any publications stemming from this research. The findings may be presented at academic conferences to other researchers and academics in the field and/or published in academic journals.

**Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.**

**The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.**

**This research has been approved by the Education and Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 474-7122. A copy of this consent form has been given to you to keep for your records and reference.**

**Participant Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

Do you wish to receive to receive a summary of results at the end of the study?

- Yes  
 No

If so, please provide mailing or email address that you would like these results sent to:

\_\_\_\_\_  
 \_\_\_\_\_

## Appendix H: Debrief

Thank you very much for participating in this study! Your participation is very valuable and contributes greatly to this research. We ask that you please not share the information in this form with others who may be participating in this study. It is important that participants complete the study without knowledge of its specific purpose.

The purpose of this study was to increase the understanding of the role of shame and guilt in the self-regulation of exercise.

This study consisted of a series of online questionnaires that were administered depending on if the participant engaged in the intended exercise session or not. The study duration varied for each participant and continued until at least one intended exercise session was engaged in and at least one was missed. The maximum amount of time a participant could be involved in the study was three weeks.

We do not yet have all of the study results, but we look forward to seeing how our research may contribute to the knowledge about guilt, shame and self-regulation. We estimate that a summary of the results will be available by March, 2014. If you would like a summary of these results please indicate that here as well as how you would like to be contacted with that summary of results when they become available

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As some information about the true purpose of the study has been kept from you until this point, you have the right to withdraw your data. In this case, your data will be destroyed and not used in the analyses. Choosing to withdraw will not lead to any negative consequences for you. If you want your data removed, please contact the principal investigator.

If you have questions or comments about this study, please contact the principle researcher (contact information is listed below). Again, we ask that you not share the information presented here. It is possible that if participants know the whole purpose of the study, the results may be affected.

To thank you for your participation we would like to offer you a gift card to Amazon.com. This merchant will send the gift card directly to your email account. Which email address would you like us to send this gift card to?

---

Thanks again!

**Principal investigator:**

Laura Meade:

University of Manitoba, Faculty of Kinesiology and Recreation Management  
(204)474-7878

**Research Supervisor:**

Dr. Shaelyn Strachan:

University of Manitoba, Faculty of Kinesiology and Recreation Management

(204) 474-6363

**We would also like to assure you that the University of Manitoba Education/Nursing Research Ethics Board has approved of this research. If you have any questions regarding your rights as a participant, you may contact the Human Ethics Coordinator at:  
(204)474-7122.**