THE ROLE OF PERFECTIONISM AND SHAME IN UNDERSTANDING EXCESSIVE EXERCISE TENDENCIES

by

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Abstract

Previous research has identified perfectionistic traits and negative affect as developmental and maintenance factors for exercise dependence. However, the interplay between these has not yet been determined. The current study aimed to gain a better understanding of how perfectionism, shame, and emotion regulation difficulties may help inform excessive exercise tendencies. Eighty-six female post-secondary students were asked to complete self-report questionnaires and were randomly assigned to view shame-based advertisements either related specifically to physical activity or more general content. The findings propose that shame as a function of perfectionism level, may explain symptoms of excessive exercise. Specifically, socially-prescribed perfectionism appeared to be a unique predictor of exercise cravings and emotion regulation difficulties. Furthermore, results suggest that impulse control difficulties may lead to a reduction in duration of exercise participation. Together, shame and perfectionism seem to be implicated in the development of excessive exercise tendencies. Future research should further consider the interrelatedness of perfectionism, shame and emotion regulation that may help explain not only excessive exercise tendencies, but also exercise avoidance.

Keywords: perfectionism; shame; excessive exercise; emotion regulation

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Table of Contents

List of Tables

List of Figures

List of Appendices

The Role of Perfectionism and Shame in Understanding Excessive Exercise Tendencies

Both physical activity (i.e., any form of energy consumption due to the movement of skeletal muscles) and exercise (i.e., a subtype of physical activity that is planned and intended to promote physical fitness) are commonly associated with positive psychological benefits (Canadian Society for Exercise Physiology, 2015; Callaghan, 2004). Such benefits include increases in self-esteem and self-efficacy, and decreases in anxiety, depression, and stress (Callaghan, 2004; ten Have, de Graaf, & Monshouwer, 2011). Furthermore, the Canadian Society for Exercise Physiology (CSEP) outlines the important health benefits of physical activity including its role in the prevention of premature death, heart disease, stroke, cancer, diabetes, and obesity. Although the CSEP emphasizes the importance of physical activity for better health in a set of guidelines that encourage adults to engage in 150 minutes of moderate to vigorous physical activity within one week, many adult Canadians (approximately 68% between the ages of 18-39; Statistics Canada, 2015) do not meet these guidelines. However, for those who engage in physical activity, exercise may become excessive and debilitating outcomes such as symptoms of distress (Duncan, Hall, Wilson, & Jenny, 2010), anxiety (Grandi, Clementi, Guidi, Benassi, & Tossani, 2011), depression, feelings of guilt (LePage, Price, O'Neil, & Crowther, 2012), and suicidal behaviour (Brown & Blanton, 2002; Smith et al., 2013) may result. This suggests that exercise in an extreme form may be detrimental to one's health (Lichtenstein, Christiansen, Elklit, Bilenberg, & Stoving, 2014).

Various terms have been used to label the pattern of symptoms often present in those who exercise excessively. For example, the terms exercise addiction (Aidman & Woollard, 2003; Duncan et al., 2010), exercise dependence (Adams, Miller, & Kraus, 2003; Allegre, Souville, Therme, & Griffiths, 2006; Bamber, Cockerill & Carroll, 2000; Grandi et al., 2011; Hausenblas

& Downs, 2002; Seigal & Hetta, 2001; Zmijewski & Howard, 2003), compulsive exercise (Flett & Hewitt, 2005; Guidi et al., 2009) and obligatory exercise (Hall, Kerr, Kozub, & Finnie, 2007; Pritchard & Beaver, 2012) have all been used to describe the same exerciser profile. Excessive exercisers may present with uncontrollable exercise behaviours, such as engaging in rigid exercise routines despite the presence of physical injury or illness (Adams et al., 2003; Allegre et al., 2006; Berczik et al., 2012; Duncan et al., 2010; Hagan & Hausenblas, 2003; Hamer, Karageorghis, & Vlachopoulos, 2002; Hausenblas & Downs, 2002; Shroff et al., 2006). These individuals have often been described as lacking a sense of control over participation in exercise, and suffer from constant obsessions with and urges for exercise (Adams et al., 2003; Allegre et al., 2006; Berczik et al., 2012; Cockerill & Riddington, 1996; Edmunds, Ntoumanis, & Duda, 2006; Hagan & Hausenblas, 2003).

As a result, the controlling influence of exercise may disrupt other areas of life, leading individuals to disengage from social and occupational activities that used to be of interest (Adams et al., 2003; Allegre et al., 2006; Gapin & Petruzzello, 2011; Shroff et al., 2006). Further, when in situations where they are unable to exercise, excessive exercisers may experience adverse effects of withdrawal, through subsequent anxiety, guilt, depression, anger, and fatigue (Adams et al., 2003; Aidman & Woollard, 2003; Allegre et al., 2006; Berczik et al., 2012; LePage et al., 2012; Shroff et al., 2006; Zmijewski & Howard, 2003). This pattern of symptoms suggests that there is a more addictive quality to a seemingly healthy behaviour that in an extreme form may pose a threat to overall well-being, which is a common feature in mental health disorders such as eating disorders.

Consistent with what is often observed in the case of the diagnosis of mental health concerns, individuals may present with various combinations of symptoms and therefore there

may be variability in the way in which excessive exercisers present themselves. This may coincide with Edmunds et al.'s (2006) conclusion that the prevalence of exercise dependence is not well understood (Hamer et al., 2002), and rather it is the associated symptoms and debilitating outcomes (more likely present in exercisers) that have been of most interest in the literature. Edmunds et al. (2006) also concluded that there is a need for further investigation of the underlying predictors of exercise dependent symptoms rather than the full manifestation of exercise dependence. As with the suggestion that the symptoms of exercise dependence need to be better understood, this study seeks to understand the susceptibility to excessive exercise tendencies or exercise dependent symptoms themselves rather than to focus on the full constellation of symptoms that may be present for exercise dependence. More specifically, we will examine predictors of the compulsive quality or drive for exercise, a key component often present in exercisers at risk for exercise dependence (Cockerill & Riddington, 1996; Edmunds et al., 2006; Hagan & Hausenblas, 2003).

The importance of investigating obligatory exercise attitudes in excessive exercisers was highlighted by Seigal and Hetta's (2001) study findings in a sample of female exercisers between the ages of 17 and 23. They compared groups of frequent exercisers, obligatory exercisers, and healthy exercisers. Frequent exercisers included those who exercised for at least one hour, six times per week. Obligatory exercisers included those with high levels of obligatory attitudes toward exercise, regardless of exercise frequency. For example, exercising despite physical injury or illness, feelings of guilt or anxiousness when not exercising, rigid exercise patterns, and disengaging from social or occupational activities. Healthy exercisers included those who did not meet the requirements for either of the previously mentioned groups. The researchers found that the obligatory exercisers had significantly higher levels of body image concerns, dieting,

bingeing behaviours, stress, and perfectionistic tendencies than the other groups of exercisers. These findings suggest that psychological distress may be most salient when obligatory attitudes toward exercise are present and, further, that these symptoms are not influenced solely by the frequency or duration of exercise. Rather, these findings emphasize the importance of examining the compulsive or obligatory symptoms associated with exercise dependence as significant psychological impairment has been shown to be closely linked to these symptoms.

The obsessive thoughts, compulsive behaviours, and emotional deficits associated with exercise dependence have been observed in post-secondary student populations (Guidi et al., 2009; Zmijewski & Howard, 2003), suggesting that this population may be at high risk for unhealthy exercise behaviours. Although the degree to which this is present in post-secondary students has been found to differ significantly (18.1 - 45.9%; Garman, Hayduk, Crider, & Hodel, 2004; Guidi et al., 2009; MacLaren & Best, 2010; Sussman, Lisha, & Griffiths, 2011; Zmijewski & Howard, 2003), it appears that the prevalence may still be relatively high within this population. It is noteworthy to mention that the variability in prevalence could be a function of gender, however, the way in which exercise dependence was defined appears to account for greater variability and serves as an ongoing issue in the excessive exercise literature (Berczik et al., 2012; Edmunds et al., 2006; Hamer et al., 2002; Landolfi, 2013; MacLaren & Best, 2010). Excessive exercise tendencies have also been strongly associated with clinically relevant symptoms such as disordered eating attitudes and behaviours (e.g. drive for thinness, preoccupation with food and/or weight, body dissatisfaction, restrained eating, binge eating, and purging behaviours; Gapin & Petruzzello, 2011; Goodwin, Haycraft, Willis, & Meyer, 2011; Grandi et al., 2011; Gulker, Laskis, & Kuba, 2001; Hausenblas & Downs, 2002; Lease & Bond, 2013; LePage et al., 2012; Lichtenstein et al., 2014; Lipsey, Barton, Hulley, & Hill, 2006;

McLaren, Gauvin, & White, 2001; Seigal & Hetta, 2001; Shroff et al., 2006; Taranis & Meyer, 2010; Zmijewski & Howard, 2003), and obsessive and compulsive qualities (Adams et al., 2003; Goodwin et al., 2011; Gulker et al., 2001), suggesting that excessive exercise tendencies may put individuals at risk for more severe mental health concerns.

More specifically, research studies have highlighted the importance of excessive exercise tendencies in predicting disordered eating psychopathology. Cook and Hausenblas (2008) found that in a sample of female university students, symptoms of exercise dependence served as a mediator for the strong association between exercise activity and disordered eating symptoms. McLaren et al. (2001) also identified the key role of excessive exercise as a mediator in a sample of female university students, however, in this study, it served as a mediator for the relationship between perfectionism and dietary restraint. These findings suggest that individuals who engage in unhealthy exercise behaviours may be vulnerable to additional psychological distress, putting both physical and mental health at further risk. Altogether, these studies highlight the adverse effects of maladaptive exercise tendencies and the importance of examining susceptibility to these patterns of behaviour in at-risk post-secondary students.

Additional research studies suggest that excessive exercise symptomology may also have a negative impact on current mental state. Shroff et al. (2006) conducted a study examining excessive exercise symptoms in women with eating disorder diagnoses. The researchers found that the women who presented with excessive exercise tendencies had more severe psychopathology, including higher levels of anxiety, more severe disordered eating behaviours, and more obsessions and compulsions than those who did not engage in unhealthy exercise behaviours. In a review of the eating disorder and excessive exercise literature, Meyer, Taranis, Goodwin, and Haycraft (2011) also concluded that excessive exercise plays a significant role in

the severity of symptoms, as well as the onset and maintenance of disordered eating patterns, in those suffering from eating disorders. Although there is a close link between excessive exercise tendencies and disordered eating behaviours, within the current study, there will be a focus primarily on examining the susceptibility of post-secondary students for excessive exercise tendencies, as this area in the literature requires additional research (Duncan et al., 2010). The strong relationship between excessive exercise tendencies and mental health concerns such as disordered eating and eating disorders, suggests that there is a need to examine potential risk factors for excessive exercise in the student population so that individuals who may be at risk can be more effectively identified and, further, practitioners and researchers in the field of psychology may be better equipped to address associated maladaptive behaviours.

Perfectionism and Excessive Exercise Tendencies

It is recognized that excessive exercise tendencies exist within a social context, with the presence of sociocultural pressures that place an emphasis on physical attractiveness and ideal physiques (Chalk, Miller, Roach, & Schultheis, 2013; Landolfi, 2013; Lease & Bond, 2013; Lichtenstein et al., 2014; Magnus, Kowalski, McHugh, 2010; Sabiston et al., 2010). Within this context, individual differences in personality predispositions become particularly relevant as they influence one's vulnerability to the influence of social ideals. In addition, there is a need to better understand the underlying personality traits that may make individuals more susceptible to engaging in unhealthy exercise behaviours (Adams et al., 2003; Anshel & Seipel, 2006; Berczik et al., 2012; Hagan & Hausenblas, 2003; Landolfi, 2013; Lichtenstein et al., 2014; Miller & Mesagno, 2014). This information may help to identify those at risk and help prevent harmful behaviours by allowing practitioners to intervene at an earlier stage of development of an exercise addiction.

For example, findings have shown that individuals at higher risk for exercise dependence and suffering from exercise dependent symptoms are often higher in trait perfectionism (Coen & Ogles, 1993; Edmunds et al., 2006; Flett & Hewitt, 2005; Gulker et al., 2001; Hagan & Hausenblas, 2003; Hall, Hill, Appleton, & Kozub, 2009; Hall et al., 2007; Hausenblas & Downs, 2002; Lichtenstein et al., 2014; Miller & Mesagno, 2014; Shroff et al., 2006; Taranis & Meyer, 2010). Trait perfectionism is frequently characterized by striving for excessively high and seemingly unrealistic standards (Flett & Hewitt, 2002; Hewitt & Flett, 1991). These high standards are often driven by a deep fear of making mistakes and disappointing others. Individuals who are high in trait perfectionism tend to be very critical of the self, place an emphasis on failures, and engage in rigid or all-or-none thinking (Sagar & Stoeber, 2009). More broadly, perfectionistic tendencies have been shown to be an underlying personality trait consistently associated with personality disorders (Saboonchi & Lundh, 1997), anxiety and depressive symptoms (Coen & Ogles, 1993), obsessive thoughts (Seigal & Hetta, 2001), and disordered eating behaviours (Bastiani, Rao, Weltzin, & Kaye, 1995; Haase, Prapavessis, & Owens, 2002; Hewitt, Flett, & Ediger, 1995; McLaren et al., 2001; Meyer et al., 2011). The strong relationship between perfectionism and excessive exercise symptoms, as well as with other psychological concerns, highlight the importance of trait perfectionism as an underlying characteristic that may serve as a predisposition for maladaptive behaviours.

Within the excessive exercise literature, there has been a trend for evaluating the effects of perfectionism by using two subcomponents including: 1) perfectionistic strivings, which has been suggested to be a more adaptive quality, associated with positive outcomes such as positive affect and goal progress, and 2) perfectionistic concerns, which has been suggested to be a more maladaptive quality, associated with poorer outcomes such as negative affect, lower levels of

positive affect, and self-determination (Flett & Hewitt, 2014; Gaudreau & Thompson, 2010; Gotwals, Stoeber, Dunn, & Stoll, 2012; Hill, Huelsman, & Araujo, 2010). However, the use of these distinctive perfectionistic qualities is controversial given the mixed findings surrounding the association between perfectionistic strivings and adaptive characteristics (Flett & Hewitt, 2005; Flett & Hewitt, 2006; Gotwals et al., 2012; Stoeber & Otto, 2006), and issues surrounding the statistical removal of overlap between the two related constructs (Flett & Hewitt, 2005; Flett & Hewitt, 2014; Gaudreau & Thompson, 2010; Gotwals et al., 2012). Researchers assert that because there is significant overlap (both statistically and conceptually) between perfectionistic strivings and perfectionistic concerns, when the overlap is statistically removed, the core elements that encompass perfectionistic strivings are eliminated, thus changing the variable conceptually (Flett & Hewitt, 2014; Gotwals et al., 2012; Hill, 2014). As a result, the remaining variable may not reflect the true definition of perfectionistic strivings and may better approach a healthier form of achievement-type striving (Flett & Hewitt, 2006). Because of the analytical issues surrounding the use of perfectionistic strivings and concerns as separate entities, we have chosen to use validated dimensions of perfectionism that have been used in the excessive exercise literature.

Researchers such as Flett and Hewitt (2005) have extended previous findings and confirmed the strong association between perfectionism and excessive exercise symptoms. They examined literature on a range of obsessive-compulsive traits (e.g. perfectionism, rigidity, preoccupation with control), and concluded that perfectionism and excessive exercise were most strongly related (Meyer et al., 2011). Consistent with Flett and Hewitt's (2005) findings, Anshel and Seipel (2006) found a positive relationship between the presence of rigid exercise routines (characteristic of exercise dependence) and perfectionism. The researchers concluded that

perfectionism may help to explain the urge or desire for regular exercisers to engage in organized and well-planned exercise patterns. More recently, Hill, Robson, and Stamp (2015) identified dimensions of trait perfectionism (self-oriented and socially prescribed) as significant predictors of exercise dependence symptoms in a sample of regular exercisers. Altogether, these findings show the close link between perfectionism and the onset and development of symptoms associated with excessive exercise. Examining perfectionism as a risk factor for exercise dependence may help to aid with the prevention of debilitating outcomes. Furthermore, a more comprehensive understanding of the role both perfectionism and excessive exercise symptoms may play as they interact with one another is important in forming a profile for individuals at risk.

Within the excessive exercise literature, there has been a primary focus on women (Bamber et al., 2000; Cook & Hausenblas, 2008; LePage et al., 2012; McLaren et al., 2001; Meyer et al., 2011; Seigel & Hetta, 2001; Shroff et al., 2006; Taranis & Meyer, 2010), where it has been noted that women display greater performance dissatisfaction (Edman, Lynch, & Yates, 2014), higher levels of perfectionism (Edman et al., 2014), greater participation in exercise for weight regulation and body appearance (Grandi et al., 2011; Lipsey et al., 2006; Miller & Mesagno, 2014; Pritchard & Beaver, 2012), and a consistent association between excessive exercise tendencies and disordered eating (Thome & Espelage, 2004; Zmijewski & Howard, 2003). Researchers also recognize the devastating effects of shame associated with body image in women in particular (Mosewich, Kowalski, Sabiston, Sedgwick, & Tracy, 2011). Altogether these findings suggest that the negative outcomes associated with excessive exercise, such as perfectionistic tendencies and shame, may be particularly relevant in females and therefore the current study will focus on female post-secondary students.

Perfectionistic appraisal and the experience of shame. Shame has been described as a self-conscious and very unpleasant emotion that has the power to disturb regular behaviours and thought processing (Lewis, 2008; Tangney, Niedenthal, Covert, & Barlow, 1998). Feelings of shame are experienced in relation to a negative evaluation of the self and are often present when personal standards or goals are not met (Boudewyns, Turner, & Paquin, 2013; Castonguay, Brunet, Ferguson, & Sabiston, 2012; Lewis, 2008; Nummenmaa & Niemi, 2004; Sagar & Stoeber, 2009; Tangney & Dearing, 2002). Given an underlying need to make self-evaluations and to achieve exceedingly high standards that are evidenced by those with strong perfectionistic tendencies, the experience of shame may be particularly relevant in understanding individual differences in susceptibility to perfectionistic concerns and how, taken together, these may in turn predict unhealthy behavioural outcomes (Elison & Partridge, 2012; Hewitt & Flett, 1991; Sabiston et al., 2010).

Stoeber, Kempe, and Keogh (2008) studied feelings of shame and found that post-secondary students who were higher in perfectionistic tendencies, experienced more shame following an experience of failure. Consistent with these findings, Rebar and Conroy (2013) also found, in a sample of post-secondary students, that feedback highlighting failure or an inability to meet personal goals correlated positively with shame. These findings suggest that the experience of shame may be a driving force underlying perfectionistic tendencies and thus the desire to engage in maladaptive behaviours.

In addition, self-discrepancy theory conceptually integrates perfectionism and shame and suggests a mechanism that may motivate the compulsive quality to engage in exercise often present in those who exercise excessively. The theory proposes that through self-evaluative processes, individuals make comparisons between their actual self and ideal self (Higgins, 1987).

When a discrepancy between the actual self and ideal self exists, negative emotions such as shame often result (Castonguay et al., 2012; Sabiston et al., 2010; Tangney et al., 1998). Researchers have suggested that self-discrepancy theory may best explain the function of weight-related and body-related shame (more often present in females) in motivating physical activity (Castonguay et al., 2012; Sabiston et al., 2010). More specifically, researchers investigating weight-related discrepancies in a female sample found that the discrepancies accounted for significantly more variance in feelings of shame than feelings of guilt (Castonguay et al., 2012). These findings suggest that when self-discrepancies exist, shame may be more closely linked to exercise behaviours and needs to be more closely examined.

As an extension of self-discrepancy theory, identity theory (Burke, 1980, 1991; Hogg, Terry, & White, 1995) outlines similar views of the function of shame in those with self-discrepancies. Identity theorists propose that when there is a disagreement between expectations particularly important to one's identity (e.g. exerciser) and actual behaviours, individuals will be more likely to feel ashamed (Flora, Strachan, Brawley, & Spink, 2012; Tracy & Robins, 2007). Heightened feelings of shame may then motivate individuals to resolve the discrepancy by engaging in maladaptive behaviours that meet the standards associated with one's valued identity. This may create a flawed mechanism serving to regulate feelings of shame. As evidenced by Flora et al.'s (2012) study, the presence of an exercise identity in regular exercisers was a significant predictor of feelings of shame following failure. Also, the extent to which exercisers identified with exercise correlated positively with feelings of shame. These results lend support to the idea that the strength with which one associates with exercise may predict one's vulnerability to feelings of shame when there are discrepancies within the exercise identity. Therefore, shame which is experienced as more personally significant or specifically in response

to a set of exercise expectations within an exerciser, may be a key component in understanding the driving motives and regulation system for excessive exercise behaviours.

Excessive Exercise Tendencies as a Maladaptive Emotion Regulation Scheme

The use of maladaptive emotion regulation strategies may serve as a possible explanation for the relation between perfectionism, shame, and excessive exercise symptoms. Research findings indicate that those higher in perfectionism often use maladaptive strategies to avoid negative affect, such as shame, guilt, or depressed mood, that can be associated with a perceived failure to meet high expectations (Elison & Partridge, 2012; Flett & Hewitt, 2002; Hewitt & Flett, 1991; Longbottom, Grove, & Dimmock, 2012). Consequently, research on excessive exercise suggests that it is not necessarily the quantity of exercise that distinguishes excessive exercisers from non-excessive exercisers, but rather the negative affect and motives associated with the exercise behaviours (Gapin & Petruzzello, 2011). LePage et al. (2012) confirmed this relationship in a sample of undergraduate females. The researchers found that females who engaged in exercise weekly and who presented with high excessive exercise tendencies (such as daily exercising, rigid exercise routines, feelings of guilt when unable to exercise, and interruptions to social and/or occupational activities), experienced more negative affect than those with low excessive exercise tendencies. Consistent with the perfectionism literature, studies on excessive exercise suggest that this desire may also be driven by a need to avoid negative affect, resulting in a form of negative reinforcement (Allegre et al., 2006; Goodwin, Haycraft, & Meyer, 2012; Hausenblas, Gauvin, Downs, & Duley, 2008; Hill et al., 2015; Meyer et al., 2011; Thome & Espelage, 2004; Zmijewski & Howard, 2003). These findings indicate that excessive exercise tendencies appear to parallel perfectionistic presentations in regards to the

common inclination for the use of ineffective emotion regulation strategies to seemingly cope with the effects of negative affect.

Coen and Ogles (1993) and Grandi et al. (2011) confirmed the presence of a maladaptive mood regulation system in excessive exercisers. The researchers found that excessive exercisers were more likely to use poorer coping strategies and experienced more anxiety and depressed mood when dealing with stressful situations compared to healthy exercisers. Also, in a review of the excessive exercise literature, Meyer et al. (2011) proposed that individuals who are not able to cope with negative emotions appropriately may be more susceptible to using exercise as an unhealthy strategy to regulate mood. These findings highlight the significant role that maladaptive emotion regulation strategies may play in the onset of problematic exercise behaviours.

Consistent with the encouragement of more conceptually integrative approaches for understanding individual differences in affect and behaviour (Lease & Bond, 2013; Sabiston et al., 2010), the current study aims to expand the excessive exercise literature by taking an integrative approach to understanding individual differences in psychological predispositions and the experience of affect, and further, the relationship between affect and excessive exercise behaviours. While the controlling influence of these constructs have been studied individually, the current study will progress the literature by examining the relationship between differences in trait perfectionism and feelings of shame to further understand the extent of their influence together on excessive exercise tendencies in females.

Hypotheses

It was hypothesized that there will be a perfectionism by shame condition (shame general STD, shame specific physical activity) interaction on exercise tendencies, with those higher in

perfectionism and in the shame specific condition planning for more frequent exercise activity for longer durations.

It was hypothesized that there will be a perfectionism by shame condition (shame general STD, shame specific physical activity) interaction on obligatory exercise behaviours, with those higher in perfectionism and in the shame specific condition experiencing greater obligatory exercise behaviours.

It was hypothesized that there will be a perfectionism by shame condition (shame general STD, shame specific physical activity) interaction on exercise cravings, with those higher in perfectionism and in the shame specific condition experiencing a higher degree of exercise cravings.

It was hypothesized that perfectionism will be a significant positive predictor of emotion dysregulation, with those higher in perfectionism experiencing a significantly higher degree of emotion dysregulation.

Lastly, it was hypothesized that emotion dysregulation will be a significant positive predictor of planned exercise activity, obligatory exercise attitudes, and current exercise cravings. We expected that a higher degree of emotion dysregulation will predict greater tendencies for more frequent exercise activity for a longer duration, greater obligatory exercise attitudes, and greater exercise cravings.

Method

Participants

Eighty-six female students (M = 22.40, SD = 7.89) were recruited from Laurentian University (Sudbury and Barrie campuses) and Georgian College (Barrie). Participants majored in programs including psychology (27.9%), social work (26.7%), kinesiology (19.8%), sports

psychology (10.5%), sport and physical education (9.3%), health promotion (4.7%) and outdoor adventure leadership (1.2%). The sample of females was primarily Caucasian (83.7%), while the remaining participants reported as Black (5.8%), Asian (2.4%) or Other (5.8%).

Self-reported Measures

Perfectionism. The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) was used as a measure of trait perfectionism. The MPS is a 45-item scale that includes three subscales or dimensions including: self-oriented perfectionism (SOP), other-oriented perfectionism (OOP), and socially prescribed perfectionism (SPP; see Appendix A). Each scale contains 15 items from which participants rate, on a 7-point Likert scale, how strongly they agree with the item (1=strongly disagree to 7=strongly agree). The MPS is scored by adding up the rating scale responses of each subscale to obtain subscale total scores. Higher scores indicate greater levels of the specified trait.

Studies have provided evidence of high internal consistency and adequate reliability and validity for the MPS in clinical and nonclinical populations. Researchers have found coefficient alphas of .86-.91 for the SOP subscale, .74-.82 for the OOP subscale and .81-.87 for the SPP subscale (Hewitt & Flett, 1991; Miller & Mesagno, 2014). Researchers have observed test-retest reliabilities over a period of 3 months including .88 for SOP, .85 for OOP and .75 for SPP in a sample of students. For the purpose of the current study, the self-oriented perfectionism and socially-prescribed subscales were included.

Exercise activity. A modified version of the Godin Leisure-Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985) was administered to measure typical and planned exercise activity for one week including frequency, intensity, and duration of exercise. The GLTEQ is a four-item questionnaire that asks participants how often they engage in strenuous, moderate,

light, and sweat-inducing activities (see Appendix B). Additional items were added to capture the duration (in minutes) of each intensity of exercise activity. Higher scores indicate participation in more frequent and longer durations of exercise activity. Test-retest reliability coefficients for the GLTEQ have been found to range from .46-.94, over a two-week period. Findings show that GLTEQ scores can be used to distinguish individuals who are fit from those who are unfit. In the present study, frequency and duration of strenuous exercise will be examined due to its significance within exercise dependence literature (Chung & Liu, 2013; Edmunds et al., 2006; Godin & Shephard, 1985; Hagan & Hausenblas, 2003)

Emotion dysregulation. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used to measure difficulties in emotion regulation that are considered clinically relevant. The DERS is a 36-item scale that assesses how often the items relate to participants using a 5-point rating scale (ranging from 1 = "almost never, 0-10%" to 5 = almost always, 91-100%, see Appendix C). The current study used select subscales including non-acceptance of emotional responses and impulse control difficulties to assess dimensions of emotion dysregulation. Higher subscale scores indicate greater tendency for secondary emotions or non-acceptance of emotional responses and difficulties maintaining control over behavior during emotional experiences. Researchers have found support for high internal consistency for DERS items (Cronbach alpha=.93; Gratz & Roemer, 2004) and subscales (Cronbach alphas >.80), as well as adequate construct and predictive validity. There is also supportive evidence for good test-retest reliability that was measured over a time range of four to eight weeks (r=.88; Gratz & Roemer, 2004).

Negative affect. A Visual Analog Scale (VAS) was used as a manipulation check for feelings of shame and other negative affect including guilt, sadness, anger and fear. The VAS

consists of a 100 mm long horizontal line which has verbal anchors (not at all, very much) on either end of the continuum as responses to an emotion based statement (e.g. "I am ashamed"; see Appendix D). The participants were asked to rate how they felt for a list of negative emotions by placing a vertical line on the horizontal line. Higher scores indicate higher levels of negative affect felt. Researchers have found high internal consistencies for the VAS with Cronbach alphas ranging from .74 to .80 (Kontou, Thomas, & Lincoln, 2012). Kontou et al. (2012) found support for convergent validity of the VAS through correlations between the Visual Analog Mood Scale (VAMS) and measures of depression and anxiety (r=.62-.69) and self-esteem (r=.69).

Exercise craving. A modified version of the Tobacco Craving Questionnaire-Short Form (TCQ-SF; Heishman, Singleton, and Pickworth, 2008) was used to measure exercise cravings. The TCQ is a multidimensional self-report measure of tobacco craving and includes factors such as emotionality, expectancy, compulsivity, and purposefulness (Heishman, Singleton, & Moolchan, 2003). The full version includes 47 items that requires participants to make Likert-type ratings from 1 (strongly disagree) to 7 (strongly agree). The TCQ has been shown to be a valid and reliable measure, with Cronbach alpha coefficients for the four factors ranging from .48 to .91 (Singleton, Anderson, & Heishman, 2003). Heishman et al. (2008) created the TCQ-SF and provided evidence of comparable validity and reliability to the full length TCQ, with Cronbach alpha coefficients ranging from .59 to .90 and positive correlations between the TCQ-SF and a measure of nicotine withdrawal (r=.19-.50). The TCQ-SF consists of 12-items with the same Likert-type scale and factors as mentioned above. In the current study, original TCQ items were modified to assess exercise cravings and included the following factors: emotionality, expectancy, and purposefulness. An example item from the emotionality factor includes: "I would be less irritable now if I could exercise" (see Appendix E).

Obligatory exercise. The Obligatory Exercise Questionnaire (OEQ; Pasman & Thompson, 1988), a 20-item questionnaire, was used to measure obligatory attitudes towards exercise and activities associated with personal exercise routines as reported by participants (see Appendix F). The items are rated using a 4-point Likert scale (1 = never to 4 = always) and are summed to obtain a total score. Higher scores are indicative of higher levels of obligatory exercise behaviours. The scale has an internal consistency alpha value ranging from .82 to .96 and strong test-retest reliability (r = .96; Coen & Ogles, 1993; Gapin & Petruzzello, 2011; Hausenblas & Downs, 2002; Pritchard & Beaver, 2012). Researchers who have examined the scale have provided evidence for positive correlations between the OEQ and measures of anxiety when unable to exercise (r = .47 - .87), engaging in exercise regardless of physical injury (r = .33 - .72), and exercise dependence (r = .75; Coen & Ogles, 1993; Hausenblas & Downs, 2002; Pasman & Thompson, 1988).

Demographic information. A demographic questionnaire was administered to collect basic information on sample characteristics such as age, ethnicity, and education (see Appendix G).

Shame Manipulation

Since personal significance of content in a given situation may play a predictive role in the experience of shame, two stimulus conditions were created to address this (Nummenmaa & Niemi, 2004; Scherer, 1999). The formatting of each of the stimuli were based on the shame stimulus presented in Boudewyns et al.'s (2013) study where participants were asked to evaluate an advertisement that implicitly elicited shame through the use of shame-based adjectives (see example in Appendix I). For the current study, both stimuli were designed in this way to elicit feelings of shame, and each condition included the same shame-based adjectives (e.g. immature,

selfish, and irresponsible). The stimuli differed based on the content used to elicit feelings of shame. In the shame specific condition, the advertisement was created in a way to elicit feelings of shame surrounding the consequences of failing to engage in physical activity (see Appendix H). In the general shame condition (see Appendix I), the content highlighted the consequences associated with not being tested for sexually transmitted diseases.

Procedure

Participants were recruited via an online experiment management system (SONA) and in-class recruitment. The study materials were computerized and administered using MediaLab software. Although study completion was voluntary, participants were compensated with course credit for their participation. Once informed consent was provided, participants were asked to fill out a demographic questionnaire and measures assessing perfectionism, typical exercise behaviours, and emotion regulation difficulties. They were then randomly assigned to a shame condition (general vs specific) within which they were asked to evaluate an advertisement aimed at the student demographic. Participants were asked to comment on the quality of the advertisement and whether it would have an influence on their behaviour. Following the evaluation, participants were asked to complete self-report measures for current mood and interest in exercise. Participants then reported on planned exercise activity for the upcoming week and obligatory exercise behaviours. Upon completion, participants were debriefed.

Results

Data Cleaning and Sample Characteristics

Two participants were removed from the dataset as a result of software malfunction during data collection. Two additional participants were removed from the dataset for scoring

below the cut-off score of 8 (out of 10) on the indiscriminant response scale items, as this is reflective of an inconsistent response pattern.

Baseline differences between conditions. The sample (N=86) demographics and baseline scale means for each advertisement condition are presented in Tables 1 and 2. There were no significant differences between conditions across all baseline indicators (all $p_s > .05$). Although the distribution program types did not differ significantly across conditions at baseline, additional analyses indicated that there were significant differences at baseline between physically focused and non-physically focused (other) program types. Those in physically focused programs scored higher (M = 3.756, SD = 1.963) than those in other programs (M = 2.106, SD = 1.812) in frequency of strenuous activity, $t(84) = -4.048$, $p<.001$. A similar pattern of significant differences was also noted for the duration of strenuous activity, $t(83) = -3.583$, $p = .001$, where those in the physically focused programs (M = 51.026, SD = 27.528) scored significantly higher than those in other programs (M = 29.261, SD = 28.222).

Baseline scale means and established norms. A review of the literature suggests that the baseline scale means (in Table 2) appear consistent with those observed in previous studies of undergraduate and college students, and more specifically, female undergraduate students (Dvorak et al., 2014; Ferrari, 1995; Flett, Hewitt, Blankstein, & Gray, 1998; Gratz & Roemer, 2004; Hewitt & Flett, 1991; Hewitt, Flett, & Ediger, 1995; Motl, McAuley, & DiStefano, 2005; Reed & Phillips, 2005; Wimberley & Stasio, 2013).

Scale Reliability

Reliability analyses of the scales from the current study indicated acceptable reliability across measures, with alpha coefficients exceeding .70 (Nunnally & Bernstein, 1994). The only

exception was the Exercise Cravings Questionnaire purposefulness subscale that had an alpha value of .643. Reliability coefficients for all scale measures are presented in Table 3.

Table 1

Demographics by Condition and for the Overall Sample

	Advertisement Type		
Characteristic	Exercise	STD	Total
	N (%)	*N (%)*	*N (%)*
Ethnicity			
Caucasian	38 (84.4)	34 (82.9)	72 (83.7)
Black	3 (6.7)	2 (4.9)	5 (5.8)
East Asian	---	1 (2.4)	1 (1.2)
South Asian	---	1 (2.4)	1 (1.2)
Other	2(4.4)	3 (7.3)	5 (5.8)
Intended Major			
Physical type	21 (46.7)	18 (43.9)	39 (45.3)
Other type	24 (53.3)	23 (56.1)	47 (54.7)
Previous Eating Disorder			
Yes	3 (6.7)	1 (2.4)	4 (4.7)
No	42 (93.3)	40 (97.6)	82 (95.3)
Age	*M (SD)*	*M (SD)*	*M (SD)*
	21.82 (6.24)	23.02 (9.43)	22.40 (7.89)

Note. STD = Sexually Transmitted Disease. Physical program type includes Sports Psychology, Kinesiology, Health Promotion, Sport and Physical Education, and Outdoor Adventure program majors. Other program type includes Psychology and Social Work program majors.

Interrelatedness of Baseline Measures

Bivariate correlational analyses were conducted to examine the relationships among baseline indicators (see Table 4). Significant positive correlations were noted among perfectionism indicators and those assessing difficulties in emotional regulation as well as between indicators of strenuous exercise frequency and duration.

Table 2

Baseline Scale Means (Standard Deviations) by Condition and for the Overall Sample

	Advertisement Type		
	Exercise	STD	Total
Scale	*M (SD)*	*M (SD)*	*M (SD)*
DERS: Impulse	12.64 (6.07)	11.18 (4.81)	11.95 (5.53)
DERS: Non-acceptance	16.49 (7.54)	15.17 (5.20)	15.86 (6.53)
GLTEQ: Strenuous Duration	40.68 (29.47)	37.71 (30.46)	39.25 (29.81)
GLTEQ: Strenuous Frequency	2.81 (1.98)	2.90 (2.14)	2.86 (2.04)
MPS: Self-oriented	74.96 (13.46)	77.60 (14.30)	76.20 (13.84)
MPS: Socially-prescribed	56.51 (14.00)	56.27 (12.14)	56.40 (13.07)

Note. STD = Sexually Transmitted Disease, DERS = Difficulties in Emotion Regulation Scale, GLTEQ = Godin Leisure Time Exercise Questionnaire, MPS = Multidimensional Perfectionism Scale.

Tests of the Effect of Perfectionism and Shame Condition on Strenuous Exercise Activity

Separate moderated multiple regression analyses were conducted to determine if the variation in planned strenuous exercise activity and duration are explained by the interaction between each perfectionism facet (SPP or SOP) and shame condition. All assumptions of multiple regression analyses were met.

Strenuous exercise frequency. Shame condition was a significant moderator, $t(81) = -2.533$, $p = .013$, $sr^2 = .073$, of the relationship between SPP and frequency of planned strenuous exercise. As can be seen in Figure 1, for those in the shame specific physical activity condition ($B = -.037$) there was a decrease in frequency of planned strenuous exercise as SPP increased

whereas for those in the generic STD shame condition (B = .041) there was an increase in frequency of planned strenuous exercise as SPP increased.

There was no significant interaction, $t(80) = -1.223$, $p = .225$, and no significant main effects of shame condition, $t(81) = -.045$, $p = .964$, or SOP, $t(81) = .862$, $p = .391$, on frequency of strenuous exercise when the interaction term was removed from the model.

Table 3

Reliability Analysis of Study Scales and Subscales

Scale	Cronbach's Alpha	Number of Items
DERS: Impulse	.922	6
DERS: Non-acceptance	.927	6
ECQ: Emotionality	.779	3
ECQ: Expectancy	.913	3
ECQ: Purposefulness	.643	3
MPS: Self-oriented	.912	15
MPS: Socially-prescribed	.870	15
OEQ	.878	20

Note. DERS = Difficulties in Emotion Regulation Scale, ECQ = Exercise Craving Questionnaire, MPS = Multidimensional Perfectionism Scale, OEQ = Obligatory Exercise Questionnaire.

Strenuous exercise duration. No significant interaction, $t(80) = -1.079$, $p = .284$, was noted between shame condition and SPP on duration of planned strenuous exercise. Further, no significant main effects of shame condition, $t(81) = 1.134$, $p = .260$, or SPP, $t(81) = .-1.378$, $p = .172$, were observed when the interaction term was removed from the model.

There was also no significant interaction, $t(79) = -1.090$, $p = .279$, and no significant main effects of shame condition, $t(80) = 1.080$, $p = .284$, or SOP, $t(80) = .390$, $p = .698$, on duration of planned strenuous exercise following removal of the nonsignificant interaction term.

Table 4

Bivariate Correlations among Measures at Baseline

Scale	1	2	3	4	5	6
1. DERS: Impulse	---					
2. DERS: Non-acceptance	.576**	---				
3. GLTEQ: Strenuous Dur.	-.139	-.078	---			
4. GLTEQ: Strenuous Freq.	-.142	.020	.428**	---		
5. MPS: Self-oriented	.267*	.237*	.129	.106	---	
6. MPS: Socially-prescribed	.430**	.471**	-.047	-.123	.375**	---

Note. * p<.05, ** p<.01. DERS = Difficulties in Emotion Regulation Scale, GLTEQ = Godin Leisure Time Exercise Questionnaire, Freq. = Frequency, Dur. = Duration, MPS = Multidimensional Perfectionism Scale.

Tests of the Effect of Perfectionism and Shame Condition on Obligatory Exercise Behaviours

Separate moderated multiple regression analyses were conducted to determine if the variation in obligatory exercise behaviours is explained by the interaction between each

perfectionism facet (SPP or SOP) and shame condition. All assumptions of multiple regression analysis were met.

There was no significant interaction, $t(82) = -.256$, $p = .798$, and no significant main effects of shame condition, $t(83) = -.631$, $p = .530$, or SPP, $t(83) = -.535$, $p = .594$, on obligatory exercise behaviours when the nonsignificant interaction was removed from the model.

There was also no significant interaction, $t(81) = -1.035$, $p = .304$, and no significant main effects of shame condition, $t(82) = -.725$, $p = .470$, or SOP, $t(82) = 1.276$, $p = .206$, on obligatory exercise behaviours following removal of the interaction term.

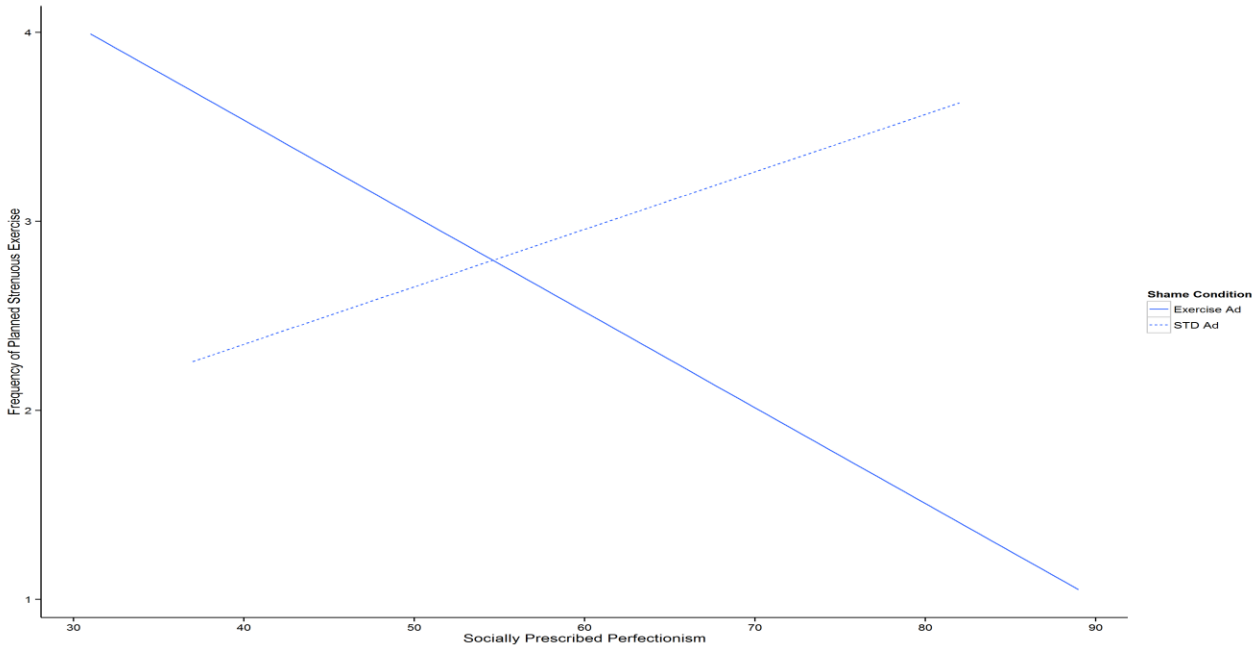

Figure 1. Moderated multiple regression results of the interaction between socially prescribed perfectionism and shame condition for frequency of planned strenuous exercise.

Tests of the Effect of Perfectionism and Shame Condition on Exercise Cravings

Separate moderated multiple regression analyses were conducted to determine if the variation in exercise cravings (purposefulness, expectancy, emotionality) is explained by the interaction between each perfectionism facet (SPP or SOP) and shame condition. All assumptions of multiple regression analysis were met.

Purposefulness. There was no significant interaction, $t(82) = -.558$, $p = .578$, between shame condition and SPP and no significant main effect of shame condition, $t(83) = -.175$, $p = .861$, on purposefulness (i.e. planning for exercise) when the interaction term was removed from the model. However, SPP (B -.063) emerged as a significant negative predictor, $t(83) = -2.158$, $p = .034$, $sr^2 = .053$, of purposefulness when the interaction term was removed from the model.

Shame condition was a significant moderator, $t(81) = -2.181$, $p = .032$, $sr^2 = .055$, of the relationship between SOP and purposefulness. As presented in Figure 2, for those in the shame specific physical activity condition (B = -.029) there was a decrease in purposefulness as SOP increased, whereas for the shame general STD condition (B = .091) there was an increase in purposefulness as SOP increased.

Expectancy. Shame condition did not have a significant moderator effect, $t(1, 82) = -1.360$, $p = .178$, on the relationship between SPP and expectancy (i.e. anticipation of beneficial effects from exercise). When the interaction term was removed from the model, the new model was significant, $t(83) = -3.193$, $p = .002$, $sr^2 = .110$. SPP (B = -.108) appeared to be a significant negative predictor of expectancy, whereas shame condition, $t(83) = -.292$, $p = .771$, was nonsignificant.

There was no significant interaction, $t(81) = -1.813$, $p = .074$, and no significant main effects of shame condition, $t(82) = -.474$, $p = .637$, or SOP, $t(82) = .880$, $p = .382$, on expectancy.

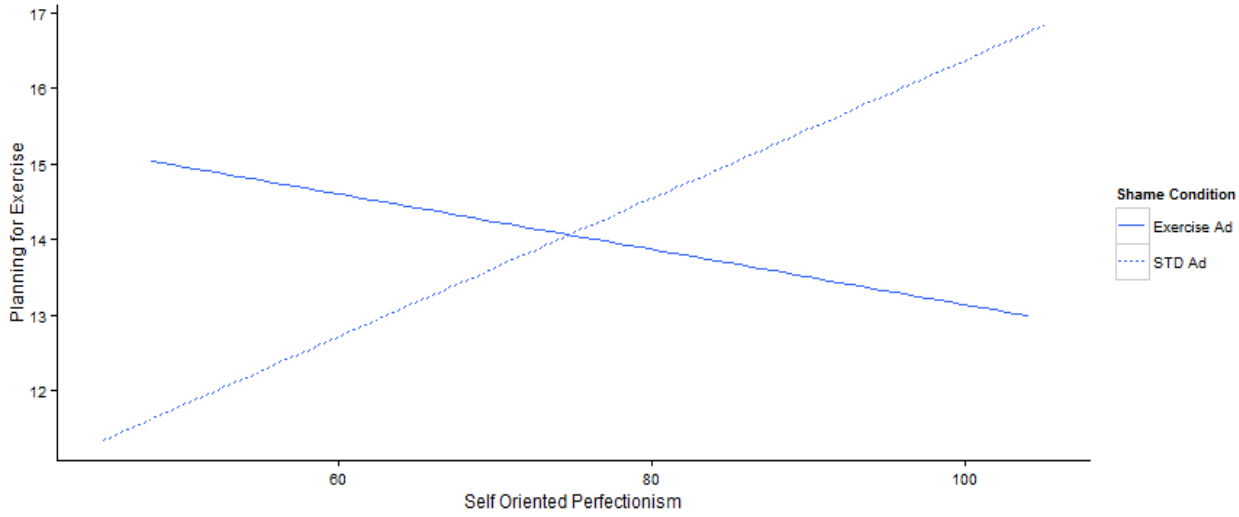

Figure 2. Moderated multiple regression results of the interaction between self-oriented perfectionism and shame condition for purposefulness.

Emotionality. No significant interaction, $t(82) = -.488$, $p = .627$, was observed between shame condition and SPP on emotionality (i.e. expected relief from negative affect). Also, no significant main effects of shame condition, $t(83) = -.743$, $p = .459$, or SPP, $t(83) = .920$, $p = .360$, were observed when the interaction term was removed from the model.

There was also no significant interaction, $t(81) = -.308$, $p = .759$, and no significant main effects of shame condition, $t(82) = -.764$, $p = .447$, or SOP, $t(82) = 1.521$, $p = .132$, on emotionality following removal of the interaction term.

Tests of the Influence of Perfectionism on Emotion Dysregulation

Separate simple linear regressions were conducted to determine if SPP or SOP predict emotion regulation difficulties (impulse, non-acceptance), with each regression model including only one perfectionism dimension as a predictor of the dependent variable of interest. All assumptions of a simple linear regression analysis were met.

Impulse control difficulties. When SPP (B = .204) was entered into a simple linear regression, it appeared to be a significant positive predictor, $t(81) = 5.423$, $p < .001$, $sr^2 = .266$, of impulse control difficulties. When entered into a simple linear regression, SOP (B = .108) was a significant positive predictor, $t(82) = 2.506$, $p = .014$, $sr^2 = .071$, of impulse control difficulties. The analyses revealed that SPP was a larger contributor to impulse control difficulties than SOP.

In order to better ascertain the nature of the contribution of SPP, we entered both perfectionism dimensions into a multiple linear regression to reveal the unique predictive ability of both SPP and SOP. When both perfectionism dimensions were entered into a multiple linear regression, SPP (B .181) remained a significant positive predictor, $t(80) = 4.174$, $p < .001$, $sr^2 = .164$, of impulse control difficulties, while SOP (B = .051) was no longer a significant predictor, $t(80) = 1.260$, $p = .211$. The overall model explained 24.9% of the variation in impulse control difficulties.

Non-acceptance of emotional responses. When SPP (B = .235) was entered into a simple linear regression, it appeared as a significant positive predictor, $t(84) = 4.898$, $p < .001$, $sr^2 = .222$, of non-acceptance of emotional responses. Simple linear regression analysis revealed that SOP (B = .112) was a significant positive predictor, $t(83) = 2.222$, $p = .029$, $sr^2 = .056$, of the variation in non-acceptance of emotional responses. It was observed that SPP was a larger contributor to the variation in non-acceptance of emotional responses than SOP.

To better ascertain the nature of the contribution of SPP, we entered both SPP and SOP into a multiple linear regression to reveal the unique predictive ability of both perfectionism facets. The analysis revealed that SPP (B = .228) remained a significant positive predictor, $t(82) = 4.301$, $p < .001$, $sr^2 = .174$, of non-acceptance of emotional responses, while SOP (B = .032)

was no longer a significant predictor, $t(82) = .655$, $p = .514$. The overall model accounted for 23.0% of the variation of non-acceptance of emotional responses.

Tests of the Influence of Emotion Dysregulation on Exercise Cravings and Behaviours

Separate simple linear regressions were conducted to determine if emotion regulation difficulties predict exercise cravings (purposefulness, expectancy, emotionality), obligatory exercise attitudes, and planned exercise activity. Each regression model included only one emotion dysregulation dimension (impulse, non-acceptance) as a predictor of the dependent variable of interest. All assumptions of simple linear regression were met.

Impulse control difficulties (B = -1.152) was a significant negative predictor $t(81) = -2.078$, $p = .041$, $sr^2 = .051$, of the variation in planned strenuous exercise duration. However, impulse control difficulties was not a significant predictor of exercise cravings, obligatory exercise attitudes, or planned strenuous exercise frequency (all $p_s > .05$). Similarly, non-acceptance of emotional responses was not a significant predictor of exercise cravings, obligatory exercise attitudes, planned strenuous exercise frequency or duration (all $p_s > .05$).

Discussion

Perfectionism and Shame

It was hypothesized that there would be an interaction between perfectionism and shame condition that would explain planned strenuous exercise activity, obligatory exercise behaviours, and exercise cravings. The findings were mixed. There was a significant interaction effect for planned frequency of exercise activity and the purposefulness subscale of the ECQ. Participants exposed to the general STD advertisement and higher in SPP planned for greater frequency of exercise, whereas those exposed to the specific physical activity advertisement and higher in SPP planned for lower frequency of exercise. The interaction model for the purposefulness subscale

followed the same theme. Participants exposed to the general STD advertisement and higher in SOP experienced greater intention to exercise for positive outcomes, whereas those exposed to the specific physical activity advertisement experienced a lower degree of this exercise craving. All other interaction models were nonsignificant.

Previous studies have examined the relationship between perfectionism and excessive exercise tendencies, and shame independently, but the current study was the first to examine the combined effects of both perfectionism and shame on excessive exercise tendencies in post-secondary students. Due to the evident association between perfectionism and exercise dependence in the literature, and further, the role of context specific shame in explaining behavioural tendencies, we expected that study findings would reflect these relationships (Flora et al., 2012; Hill et al., 2015; Lichtenstein et al., 2014; Miller & Mesagno, 2014; Taranis & Meyer, 2010). However, the current study findings did not occur in the direction we expected.

A possible explanation for these unexpected findings is apparent in the images that were used for the advertisement conditions. The general shame STD advertisement included an image of a female that appeared to be bare-skinned with a male, whereas, the shame specific physical activity advertisement included a fully clothed male at graduation with his parents. Given the female sample, the imagery in the general shame advertisement may have inadvertently manifested an idealized female appearance, and further, self-objectification. Exposure to potentially idealized imagery with a sexualized quality could have induced body-related shame and appearance anxiety in females viewing this advertisement, in addition to the shame experienced in relation to STD testing (Fredrickson & Roberts, 1997; Monro & Huon, 2005). As a result, the salience of this condition, relative to the physical activity specific one, could have influenced our outcomes.

Nonetheless, the patterns of exercise tendencies that were noted across conditions and degree of perfectionism suggest that both the context of shame and perfectionism significantly influence exercise tendencies. More specifically, shame experienced in the shame general STD condition appears to lead to increases in exercise attitudes and activity, as a function of perfectionism in female undergraduates. Alternatively, shame experienced in the shame specific physical activity condition, leads to avoidance of and decreased interest in exercise as a function of perfectionistic predisposition. These patterns coincide with the nature of perfectionism that endorses both striving for excessively high standards and avoidance of activities that may emphasize failure (Flett & Hewitt, 2006). The context within which shame is experienced may be useful in explaining the propensity for either approach or avoidance of exercise, particularly in those higher in perfectionism.

In addition to these findings, SPP emerged as a significant negative predictor of exercise cravings. More specifically, greater SPP was associated with reduced planning of exercise and expectancy of positive outcomes from exercise. Although this finding is not in support with what we hypothesized, it does align with previous findings in the perfectionism literature. Researchers have suggested that SPP is correlated with extrinsic forms of motivation (Gaudreau & Antl, 2008; Jowett, Hill, Hall, & Curran, 2013; Longbottom et al., 2012; Stoeber, Feast, & Hayward, 2009). This means that those higher in SPP are often motivated to achieve their goals for external reasons such as approval from others rather than internal reasons. Therefore, it is not surprising that in the current study socially perfectionistic tendencies were associated with lower anticipation of positive outcomes from exercise such as enjoyment and pleasure. This finding may reflect the extrinsic motivation, observed in those high in SPP, which has been associated with maladaptive outcomes such as athlete burnout (Jowett et al., 2013). Taken together, it

appears that both level of perfectionism and shame can significantly influence exercise activity and cravings.

Perfectionism and Emotion Dysregulation

It was further expected that perfectionism would be a positive predictor of emotion regulation difficulties. This hypothesis was fully supported. Both SPP and SOP were significant positive predictors of impulse control difficulties and non-acceptance of emotional responses. Follow-up analyses confirmed that SPP was a unique significant predictor of emotion regulation difficulties after controlling for the overlap between the two perfectionism dimensions. Previous studies have not yet examined the predictive ability of SPP and SOP in explaining emotion regulation difficulties as measured by the DERS. Within the context of the perfectionism literature, both SPP and SOP have been correlated with maladaptive outcomes such as eating disorder behaviours (Bastiani et al., 1995; Hewitt et al., 1995; McLaren et al., 2001), depression and anxiety (Flett & Hewitt, 2002; Flett & Hewitt, 2006; Klibert, Langhinrichsen-Rohling, & Saito, 2005; Saboonchi & Lundh, 1997), and symptoms of exercise dependence (Hall et al., 2009; Hill et al., 2015; Miller & Mesagno, 2014). Therefore, the current findings are consistent with previous findings suggesting that both dimensions of perfectionism are related to maladaptive outcomes, including difficulties in emotion regulation.

Alternatively, there is a section of research that proposes that SPP and SOP should be examined distinctly as either adaptive or maladaptive dimensions of perfectionism (Flett & Hewitt, 2002; Flett & Hewitt, 2006; Flett & Hewitt, 2014; Klibert et al., 2005; Hill et al., 2010). Typically, SPP has been identified as maladaptive, while SOP has been identified as adaptive. When separated in this way, researchers have shown support for a consistent relationship between SPP and maladaptive outcomes such as performance dissatisfaction and emotional

disturbances, whereas the findings for SOP are less clear (Flett & Hewitt, 2006; Hall et al., 2009; Hill et al., 2015; Klibert et al., 2005; Miller & Mesagno, 2014; Stoeber & Otto, 2006). The consistent relationship between SPP and maladaptive outcomes across the literature may help to explain our result of SPP as a unique predictor of emotion regulation difficulties. Overall, the findings of this study suggest that SPP may have a larger influence on emotional regulation difficulties than SOP, which appear congruent with previous findings.

Emotion Dysregulation and Excessive Exercise Tendencies

It was further expected that emotion dysregulation would predict elevated exercise cravings, obligatory attitudes and planned exercise activity. This hypothesis was not supported. Within the exercise and eating disorder literature, researchers have proposed a link between emotion regulation or coping difficulties and compulsive exercise within regular exercisers, runners, undergraduate students, and individuals affected by eating disorder symptoms (Coen & Ogles, 1993; Grandi et al., 2011; Landolfi et al., 2013; Meyer et el., 2011; Seigal & Hetta, 2001; Zmijewski et al., 2003). Previous studies have not yet examined the relationship between emotion regulation difficulties, exercise cravings, obligatory exercise attitudes, and exercise activity using the measures outlined in the current study (e.g. DERS, ECQ, OEQ, GLTEQ) in undergraduate students. Although researchers have highlighted emotion regulation as a potential maintenance factor of excessive exercise, the current study findings do not support this idea. The present pattern of results could be understood by other factors including the selection of specific elements of emotion dysregulation.

For example, this study focused on the acceptance of emotional responses and impulse control elements of emotion regulation, while it might be the emotion regulation or coping style that may be of more significance. For instance, Goodwin, Haycraft, and Meyer (2014)

determined that an internal dysfunctional emotion regulation style, involving rumination, repression, and self-harm as behavioural strategies to avoid emotions, was predictive of compulsive exercise in adolescents. In support of these findings, Elison and Partridge (2012) observed the presence of more internalized and maladaptive shame-based coping styles in a sample of college athletes. This suggests that individuals evidencing qualities of compulsive exercise may have difficulties coping with negative affect and stress and may be more limited in their capacity to use effective emotion regulation strategies. This specific aspect of the emotion regulation construct in relation to excessive exercise tendencies requires further investigation.

An unexpected finding was observed for the impulse control difficulties dimension of emotion dysregulation. The results suggest that impulse control difficulties negatively predicted the duration of planned strenuous exercise activity, such that those higher in impulse control difficulties planned for shorter durations of strenuous exercise activity. This finding may be best understood conceptually by the measures used in the current study. A lack of control over one's behaviour may make it difficult to plan for long durations of one activity due to the very nature of planning, and the cognitive resources required. This outcome suggests that impulse control difficulties have an adverse influence on planned exercise duration.

Additionally, the reduced duration of strenuous exercise activity observed in relation to impulse control difficulties may represent a form of exercise avoidance. Researchers such as Ekkekakis (2009) have highlighted the crucial role of emotional responses in motivating exercise, suggesting that, for some, exercise may be associated with negative affect and considered unpleasant (e.g. uncomfortable, tiring) or less pleasant compared to other ways to spend free time (Ekkekakis, Hargreaves, & Parfitt, 2013). Therefore, some individuals are inclined to avoid participation in exercise when it is perceived as painful, tiring, or distressing. In

accordance with the exercise psychology literature, the findings of the current study highlight the need for further research to address the role of emotional regulation strategies in predicting exercise participation and adherence in post-secondary students.

Limitations and Future Directions

A commonly raised issue within the excessive exercise literature is the lack of clarity surrounding the defining features of excessive exercise (Hausenblas & Downs, 2002). The discrepancies that exist within the characterization of excessive exercise make it difficult to interpret findings across studies. Therefore, the measures used to examine excessive exercise tendencies within the current study could have influenced the outcomes. Nevertheless, the relationships observed may support the need to form a diagnostic framework to better identify those at risk for excessive exercise. For instance, the study findings suggest that perfectionism, negative affect, and emotion dysregulation may be developmental and maintenance factors for obligatory exercise that require further examination within the context of exercise. Researchers should continue to consider the role of these variables within more diverse sample of exercisers to help form and strengthen the diagnostic framework for exercise dependency.

Based on a review of the literature, it appears that the majority of the research providing evidence for the link between perfectionism and exercise dependence has been in samples of regular exercisers or runners (Gulker et al., 2001; Hall et al., 2009; Hall et al., 2007; Hill et al., 2015; Lichtenstein et al., 2014; Miller & Mesagno, 2014; Taranis & Meyer, 2010). Fewer studies have demonstrated this relationship within university student samples, and within such studies, students have typically been grouped by severity of exercise dependence symptoms (Hagan & Hausenblas, 2003; Hausenblas & Downs, 2002). Accordingly, it is possible that the current study may not have captured the severity of excessive exercise tendencies typically reported in

previous studies, making it difficult to compare the current study findings to previous findings. Given the potential variability of investment in exercise, future studies should aim to clarify its influence on the relationship between psychological predispositions and exercise behaviours. Although the current sample may have been less invested in exercise than in previous studies, this study highlights factors that influence exercise attitudes and tendencies in female post-secondary students, who have been identified as an at-risk group for exercise dependence.

While the study results do supplement previous research on excessive exercise that has tended to focus on women, the generalizability of the findings is limited primarily to Caucasian female post-secondary students. Within the exercise literature, significant differences have been identified on exercise outcomes for sample characteristics, such as gender. More specifically, researchers have noted that excessive exercise tendencies and body image concerns occur to the same extent, or more, in males when compared to females (Guidi et al., 2009; Hall et al., 2007; Hill, 2015; MacLaren & Best, 2010; O'Dea & Abraham, 2002; Ricciardelli, McCabe, & Banfield, 2000). In order to best identify individuals susceptible to excessive exercise, it is important to consider vulnerability factors among all populations that may be affected to further help researchers and practitioners assess the onset and maintenance of maladaptive exercise attitudes and behaviours across individuals.

The design of the current study allowed for the observation of the implicit effects of advertisement content and imagery in female post-secondary students. The study results showcased the potential role of personal significance in understanding the experience of shame and its influence on behaviours. Given these findings, when using advertisements as a shame manipulation, it would be advantageous for future studies to include a measure of personal significance of the content being examined to better understand its influence. The current study

also highlighted the potential impact of the formatting of advertisements, suggesting that changes to the imagery and content, by making it more applicable to the current study sample of females, may have provided different outcomes. It is important for additional research to not only consider the psychological mechanisms that may contribute to behavioural decisions made based on advertisement content, but also the formatting of advertisements which are often used in public to promote various behaviours (e.g. physical activity).

Overall, further research is needed to better understand the initial findings. More specifically, research should examine the influence of SPP and additional dimensions of emotion regulation difficulties within the context of exercise to determine the breadth of their impact on exercise behaviours. Additionally, consideration for other variables that may also be contributing to exercise attitudes and behaviours would be beneficial, since the factors observed in the current study explain only a part of these tendencies. For example, researchers have proposed that the significance of exercise or psychological predispositions of the individual towards exercise such as motivation, obsessive-compulsiveness, body dissatisfaction, and self-esteem, may differentiate individuals at risk for unhealthy exercise attitudes and behaviours (Edmunds et al., 2006; Fortier & Farrell, 2009; Gapin & Petruzzello, 2011; Gulker et al., 2001; Hall et al., 2009; 2007; Lease & Bond, 2013; Longbottom et al., 2012). Additional research in this area will allow for further understanding of the interrelationship between psychological mechanisms that may predict unhealthy exercise behaviours and strengthen approaches for assessment and intervention of such behaviours.

The obligatory attitudes and behaviours, and the associated mental health concerns, observed in female undergraduate students, often exist within a social and cultural climate that idealizes females with a thin physical appearance (Brown, 2006; Gapin & Petruzzello, 2011;

Goodwin et al., 2011; Magnus et al., 2010). Therefore, it is not only important to consider individual predispositions that may help us understand maladaptive behaviours, but also consider the social cues within which these tendencies exist. Additional research should aim to determine the sociocultural pressures that may exist and find ways to help reduce the negative impact of such pressures on exercise behaviours in order to help improve the well-being of individuals. For example, researchers are considering more effective ways for practitioners to modify the perception of evaluative threat within society (e.g. media, fitness centres; Ekkekakis et al., 2013). It has been proposed that raising awareness of socio-cultural influences, and altering the attentional focus of individuals may help make exercise activities more satisfying and reduce adverse effects (Karageorghis et al., 2009; Rogers & Ebbeck, 2016). The current study outcomes suggest that perfectionism and shame may be factors worth considering when examining the complex interrelations between psychological and social variables that help explain exercise behaviours. Further research is needed to provide practitioners with potential tools to address the psychosocial mechanisms directly in order to prevent and reduce unhealthy exercise behaviours.

Conclusion

The outcomes highlighted within the current study expand on the literature by exploring evident associations between perfectionism, shame, emotion regulation difficulties and excessive exercise tendencies that have, to date, received little attention. The current findings suggest that the context of shame has a significant influence on exercise attitudes and behaviours, based on degree of perfectionism. The current study provides a foundation for researchers to gain a better understanding of psychological predispositions that explain both avoidant and addictive exercise tendencies prevalent in female post-secondary students. More specifically, researchers should aim to address the limitations that exist with defining excessive exercise, identify samples at risk

for unhealthy exercise behaviours, and examine the interrelationships between psychological and emotional mechanisms that may help explain excessive exercise tendencies. As such, further research will advance our knowledge on the development and maintenance of maladaptive exercise behaviours, and allow researchers and practitioners to better address these behaviours to improve the overall health and well-being of individuals.

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Appendix A

Multidimensional Perfectionism Scale

INSTRUCTIONS: Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree & to what extent. **To score your responses, put the number of your response in the column that is highlighted next to this question.**

		Disagree						Agree	Self Oriented	Other Oriented	Socially Prescribed
1.	When I am working on something, I cannot relax until it is perfect	1	2	3	4	5	6	7			
2.	I am not likely to criticize someone for giving up too easily	7	6	5	4	3	2	1			
3.	It is not important that people I am close to are successful	7	6	5	4	3	2	1			
4.	I seldom criticize my friends for accepting second best	7	6	5	4	3	2	1			
5.	I find it difficult to meet others' expectations of me	1	2	3	4	5	6	7			
6.	One of my goals is to be perfect in everything I do	1	2	3	4	5	6	7			
7.	Everything that others do must be of top-notch quality	1	2	3	4	5	6	7			
8.	I never aim for perfection on my work	7	6	5	4	3	2	1			
9.	Those around me readily accept that I can make mistakes too	7	6	5	4	3	2	1			
10.	It doesn't matter when someone close to me does not do their absolute best	7	6	5	4	3	2	1			
11.	The better I do, the better I am expected to do	1	2	3	4	5	6	7			
12.	I seldom feel the need to be perfect	7	6	5	4	3	2	1			
13.	Anything that I do that is less than excellent will be seen as poor work by those around me	1	2	3	4	5	6	7			
14.	I strive to be as perfect as I can be	1	2	3	4	5	6	7			
15.	It is very important that I am perfect in everything I attempt	1	2	3	4	5	6	7			

		Disagree						Agree	Self Oriented	Other Oriented	Socially Prescribed
16.	I have high expectations for the people who are important to me	1	2	3	4	5	6	7			
17.	I strive to be the best at everything I do	1	2	3	4	5	6	7			
18.	The people around me expect me to succeed at everything I do	1	2	3	4	5	6	7			
19.	I do not have very high standards for those around me	7	6	5	4	3	2	1			
20.	I demand nothing less than perfection of myself	1	2	3	4	5	6	7			
21.	Others will like me even if I don't excel at everything	7	6	5	4	3	2	1			
22.	I can't be bothered with people who won't strive to better themselves	1	2	3	4	5	6	7			
23.	It makes me uneasy to see an error in my work	1	2	3	4	5	6	7			
24.	I do not expect a lot from my friends	7	6	5	4	3	2	1			
25.	Success means that I must work even harder to please others	1	2	3	4	5	6	7			
26.	If I ask someone to do something, I expect it to be done flawlessly	1	2	3	4	5	6	7			
27.	I cannot stand to see people close to me make mistakes	1	2	3	4	5	6	7			
28.	I am perfectionistic in setting my goals	1	2	3	4	5	6	7			
29.	The people who matter to me should never let me down	1	2	3	4	5	6	7			
30.	Others think I am okay, even when I do not succeed	7	6	5	4	3	2	1			
31.	I feel that people are too demanding of me	1	2	3	4	5	6	7			
32.	I must work to my full potential at all times	1	2	3	4	5	6	7			
33.	Although they may not say it, other people get very upset with me when I slip up	1	2	3	4	5	6	7			
34.	I do not have to be the best at whatever I am doing	7	6	5	4	3	2	1			
35.	My family expects me to be perfect	1	2	3	4	5	6	7			

		Disagree						Agree	Self Oriented	Other Oriented	Socially Prescribed
36.	I do not have very high goals for myself	7	6	5	4	3	2	1			
37.	My parent rarely expected me to excel in all aspects of my life	7	6	5	4	3	2	1			
38.	I respect people who are average	7	6	5	4	3	2	1			
39.	People expect nothing less than perfection from me	1	2	3	4	5	6	7			
40.	I set very high standards for myself	1	2	3	4	5	6	7			
41.	People expect more from me than I am capable of giving	1	2	3	4	5	6	7			
42.	I must always be successful at school or work	1	2	3	4	5	6	7			
43.	It does not matter to me when a close friend does not try their hardest	7	6	5	4	3	2	1			
44.	People around me think I am still competent even if I make a mistake	7	6	5	4	3	2	1			
45.	I seldom expect others to excel at whatever they do.	7	6	5	4	3	2	1			
								SUBSCALE TOTALS	SO =	OO=	SP=
								Add up in each column the colored areas to create summary score for each dimension			
								Medical Student Averages and Standard Deviations (in parantheses) for Comparison (Henning et al., 1998)	**67 (15)**	**57 (13)**	**47 (13)**
								Medical students (Enns et al. 2001)	**70 (15)**	**56 (12)**	**49 (13)**

Appendix B

Godin Leisure-Time Exercise Questionnaire

1. During a typical **7-Day period** (a week), how many times on the average do 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)** (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)	_____
b) **MODERATE EXERCISE** **(NOT EXHAUSTING)** (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)	_____
c) **MILD EXERCISE** **(MINIMAL EFFORT)** (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)	_____

2. During a typical **7-Day period** (a week), in your leisure time, how **often** do you engage in any regular activity **long enough to work up a sweat** (heart beats rapidly)?

OFTEN	SOMETIMES	NEVER/RARELY
1. ☐	2. ☐	3. ☐

Appendix C

Difficulties in Emotion Regulation Scale (DERS)

Name: Date:

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

1	2	3	4	5
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

_____ 1) I am clear about my feelings.

_____ 2) I pay attention to how I feel.

_____ 3) I experience my emotions as overwhelming and out of control.

_____ 4) I have no idea how I am feeling.

_____ 5) I have difficulty making sense out of my feelings.

_____ 6) I am attentive to my feelings.

_____ 7) I know exactly how I am feeling.

_____ 8) I care about what I am feeling.

_____ 9) I am confused about how I feel.

_____ 10) When I'm upset, I acknowledge my emotions.

_____ 11) When I'm upset, I become angry with myself for feeling that way.

_____ 12) When I'm upset, I become embarrassed for feeling that way.

_____ 13) When I'm upset, I have difficulty getting work done.

_____ 14) When I'm upset, I become out of control.

_____ 15) When I'm upset, I believe that I will remain that way for a long time.

_____ 16) When I'm upset, I believe that I will end up feeling very depressed.

_____ 17) When I'm upset, I believe that my feelings are valid and important.

_____ 18) When I'm upset, I have difficulty focusing on other things.

_____ 19) When I'm upset, I feel out of control.

_____ 20) When I'm upset, I can still get things done.

_____ 21) When I'm upset, I feel ashamed at myself for feeling that way.

_____ 22) When I'm upset, I know that I can find a way to eventually feel better.

_____ 23) When I'm upset, I feel like I am weak.

_____ 24) When I'm upset, I feel like I can remain in control of my behaviors.

_____ 25) When I'm upset, I feel guilty for feeling that way.

_____ 26) When I'm upset, I have difficulty concentrating.

_____ 27) When I'm upset, I have difficulty controlling my behaviors.

_____ 28) When I'm upset, I believe there is nothing I can do to make myself feel better.

_____ 29) When I'm upset, I become irritated at myself for feeling that way.

_____ 30) When I'm upset, I start to feel very bad about myself.

_____ 31) When I'm upset, I believe that wallowing in it is all I can do.

_____ 32) When I'm upset, I lose control over my behavior.

_____ 33) When I'm upset, I have difficulty thinking about anything else.

_____ 34) When I'm upset I take time to figure out what I'm really feeling.

_____ 35) When I'm upset, it takes me a long time to feel better.

_____ 36) When I'm upset, my emotions feel overwhelming.

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Appendix D

Visual Analog Scale for Negative Affect

Instructions: On the next screen, using your mouse, drag the cursor to the area on the line that matches your CURRENT level of feeling.

1. I feel angry.

Not at all _____ **Very much**

2. I feel ashamed.

Not at all _____ **Very much**

3. I feel depressed.

Not at all _____ **Very much**

4. I feel like a failure.

Not at all _____ **Very much**

5. I feel confident in myself.

Not at all _____ **Very much**

6. I feel embarrassed.

Not at all _____ **Very much**

7. I feel guilty.

Not at all _____ **Very much**

8. I feel proud of myself.

Not at all _____ **Very much**

Appendix E

Modified Version of the Tobacco Craving Questionnaire-Short Form

INSTRUCTIONS: Indicate how strongly you agree or disagree with each of the following statements by placing a check mark in one of the spaces between STRONGLY DISAGREE and STRONGLY AGREE. The closer you place your check mark to one end or the other indicates the strength of your agreement or disagreement. If you don't agree or disagree with a statement, place your check mark in the middle space. Please complete every item. We are interested in how you are thinking or feeling **right now** as you are filling out the questionnaire.

1. I would enjoy exercising right now.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

2. If I was at a gym, I probably would exercise.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

3. Exercising would feel good right now.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

4. I would be less irritable now if I could exercise.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

5. It would be hard to pass up the chance to exercise.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

6. Exercising would be pleasant.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

7. If I were to exercise now I could think more clearly.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

8. I could not easily limit how much I exercised right now.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

9. I could control things better right now if I could exercise.
STRONGLY DISAGREE ____ : ____ : ____ : ____ : ____ : ____ : ____ STRONGLY AGREE

Appendix F

Obligatory Exercise Questionnaire

Instructions: Listed below are a series of statements about people's exercise habits. Please circle the number that reflects how often you could make the following statements:

1 – NEVER 2 – SOMETIMES 3 – USUALLY 4 – ALWAYS

1. I engage in physical exercise on a daily basis.	1	2	3	4
2. I engage in one/more of the following forms of exercise: walking, jogging/running or weightlifting.	1	2	3	4
3. I exercise more than three days per week.	1	2	3	4
4. When I don't exercise I feel guilty.	1	2	3	4
5. I sometimes feel like I don't want to exercise, but I go ahead and push myself anyway.	1	2	3	4
6. My best friend likes to exercise.	1	2	3	4
7. When I miss an exercise session, I feel concerned about my body possibly getting out of shape.	1	2	3	4
8. If I planned to exercise at a particular time and something unexpected comes up (like an old friend comes to visit or I have some work to do that needs immediate attention) I usually skip my exercise for that day.	1	2	3	4
9. If I miss a planned workout, I attempt to make up for it the next day.	1	2	3	4
10. I may miss a day of exercise for no good reason.	1	2	3	4
11. Sometimes, I feel a need to exercise twice in one day, even though I may feel a little tired.	1	2	3	4
12. If I feel I have overeaten, I will try to make up for it by increasing the amount I exercise.	1	2	3	4
13. When I miss a scheduled exercise session I may feel tense, irritable, or depressed.	1	2	3	4

14. Sometimes, I find that my mind wanders to thoughts about exercising.	1	2	3	4
15. I have had daydreams about exercising.	1	2	3	4
16. I keep a record of my exercise performance, such as how long I work out, how far or fast I run.	1	2	3	4
17. I have experienced a feeling of euphoria or a “high” during or after an exercise session.	1	2	3	4
18. I frequently “push myself to the limits”	1	2	3	4
19. I have exercised when advised against such activity (i.e. by a doctor, friend, etc.)	1	2	3	4
20. I will engage in other forms of exercise if I am unable to engage in my usual form of exercise.	1	2	3	4

Appendix G

Demographic Questionnaire

Please fill out the following general questions:

Age (in years): _____

Gender: (scale response) _____Female _____Male

Height (in inches): _____ Weight (in pounds): _____

Declared or Intended Major: (scale response)

_____Psychology _____Sports Psychology _____ Kinesiology _____Sociology _____English

_____History _____Nursing _____Social Work _____Business

_____Other (please specify):_____

Program year: (scale response) 1, 2, 3, 4, Other (please specify): _____

Full-time/part-time status: (scale response) PT / FT

People sometimes identify themselves by **"race"** and/or colour. We should point out that there is no evidence of clear biological distinctions between "racial" groups. From our perspective, such divisions are a question of culture (i.e., learned) and not of biology. Please check the group(s) that you believe best describe the group with which you most identify. Examples of heritage groups are provided.

_____ Chinese (Hong Kong, Tibetan etc.)

_____ Black (African, Caribbean, etc.)

_____ East Asian (Japanese, Korean, Vietnamese, etc.)

_____ South Asian (East Indian, Pakistani, etc.)

_____ White (Eastern European, North American, etc.)

_____ Other (please specify): _____

Were you born in Canada? _____ Yes _____ No

If you were not born in Canada, please indicate how many years you have been living in Canada? If this question does not apply to you, please put N/A. (fill in the blank)

_____

On the next screen, using your mouse, drag the cursor to the area on the line that matches your CURRENT level of agreement.

Media advertisements can significantly affect the choices we make.

Not at all _____ Very much

A healthy diet is important to me.

Not at all _____ Very much

I feel ashamed.

Not at all _____ Very much

I feel like a failure.

Not at all _____ Very much

Physical health and fitness are important to me.

Not at all _____ Very much

I feel proud of myself.

Not at all _____ Very much

I feel embarrassed.

Not at all _____ Very much

I feel confident in myself.

Not at all _____ Very much

I enjoy helping others.

Not at all _____ Very much

IRS Item: To answer this question drag the cursor to the far right.

Have you ever been diagnosed with an eating disorder? _____ Yes _____ No

Appendix H

Shame Stimulus Prototype

Appendix I

Shame Specific Physical Activity Stimulus

Up to 85% of adults currently do not meet recommended amounts of physical activity. Physical inactivity is a major risk factor for heart disease and stroke, and contributes to most other modifiable risk factors including diabetes, obesity, high blood pressure and high blood cholesterol. If you are not physically active, that does not mean you are a bad person, but it is estimated that if Canadians engaged in 60 minutes of physical activity per day, 33% of all deaths related to coronary heart disease, 25% of deaths related to stroke, 20% of deaths related to type 2 diabetes, and 20% of deaths related to hypertension could be avoided.

SHOW YOUR PARENTS RESPECT.
GET PHYSICALLY ACTIVE.

For more information:
http://www.heartandstroke.com/site/c.ikIQLcMWJtE/b.5263145/k.FA7C/Physical_Activity_Heart_Disease_and_Stroke.htm