Appearance- versus Function-Based Verbal Cues during Exercise in Young Non-Exercising Women

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Abstract

This experimental study assessed the acute effects of appearance- versus function-based verbal cues during exercise on indices of self-objectification and exercise engagement among young women non-exercisers. Participants were randomized into one of three exercise conditions (appearance, neutral, function), where an instructor delivered verbal cues during a 20-minute treadmill exercise task. Participants completed a baseline assessment of trait self-objectification, and a post-manipulation survey examining psychological states (self-objectification, body shame, social physique anxiety, flow, and interoceptive awareness) and exercise engagement (intent to exercise, exercise enjoyment, exercise motivation). The total sample included 102 women ($M_{age} = 20.2$ years, $SD_{age} = 2.1$ years). Only exercise enjoyment in the neutral condition was significantly higher compared to the function condition [$F (2, 95) = 5.155, p = .007$]. Exposure to an objectifying exercise environment did not significantly impact the psychological experiences of non-exercising women. Exercise environments that are body-neutral may lead to greater exercise enjoyment.

Keywords

Self-Objectification, Objectification Theory, Aerobic Exercise, Insufficiently Active, Women, Verbal Cues
Summary for Lay Audience

Young women commonly experience sexual objectification in daily life. Internalization of these experiences can lead to self-objectification, whereby an individual adopts a third person perspective of the self and places value on their bodily appearance. This has been associated with many negative mental health consequences such as eating disorder symptomology, depression, and sexual dysfunction. Self-objectification may also contribute to the lower rates of participation in exercise and higher rates of dysfunctional exercise that are observed in women. Oftentimes, women who cope with the pressure of objectification either avoid the exercise context or engage in exercise for appearance reasons. There are limited studies that have tested if an objectifying exercise environment leads to increased self-objectification and negatively impacts exercise experiences. This study aimed to further understand the relationship between self-objectification outcomes and exercise behaviours in young physically insufficiently active women. Young women were recruited from the university and invited to complete a short aerobic workout on a treadmill. Eligible participants ($N = 102$) were randomly assigned to one of three exercise cue conditions: an appearance-focused condition whereby verbal cues during exercise emphasized the body’s physical appearance, a function-focused condition with verbal cues that emphasized body movement and feeling, or a neutral condition that only gave verbal instruction and time cues. Participants filled out two surveys; one before the exercise task to assess dispositional levels of self-objectification and surveys post-exercise task to assess states of self-objectification and exercise experiences. It was expected that participants in the appearance-focused condition would have higher experiences of self-objectification and negative exercise experiences compared to participants in other conditions. Despite this, results showed that only participants in the neutral condition reported statistically significantly greater exercise enjoyment compared to those in the function condition. It is possible that exercise is most enjoyable when there is no emphasis on the physical self. Future research should examine the underlying relationships between self-objectification and exercise experience to promote sustained participation in young women.
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Chapter 1

1 Background

1.1 Exercise Participation in Women

Exercise is conceptualized as a leisure-time physical activity that is planned, structured and repetitive, and has numerous mental, physical, behavioural, and social benefits (e.g., Craft & Perna, 2004; Macera et al., 2003; Warburton et al., 2006). Despite the widely documented benefits of habitual exercise, over 50% of adults are not engaging in sufficient levels of activity to achieve these benefits (Campbell & Hausenblas, 2009; Carlson et al., 2010; Craft & Perna, 2004; Macera et al., 2003; Penedo & Dahn, 2005; Warburton et al., 2006; Wilson et al., 2020), and these lower rates of participation are particularly salient among women (Armstrong et al., 2018). Feminist theorists have suggested that one potential explanation for this gender disparity in physical activity may be that girls and women are disproportionately affected by sexual objectification, which is likely to occur in exercise contexts where the body is on display with potential for evaluation (Fredrickson & Roberts, 1997).

Previous research reports that heightened body image concerns are most prevalent in young women that are exposed to a multitude of objectifying experiences (Fredrickson & Roberts, 1997), those entering adulthood (Markey & Gillen, 2016; Pruis & Janowsky, 2010), and those not engaging in regular exercise behaviours (Armstrong et al., 2018; Carlson et al., 2010). While exercise has been shown to enhance women’s body image (Vocks et al., 2009), it can also increase exposure to objectifying experiences and lead to worsened body image (Greenleaf, 2005; LePage & Crowther, 2010; Reel et al., 2016). Given that exercise contexts are inherently social and evaluative in nature, and the body is often on display, the process of self-objectification may contribute to negative exercise experiences, including avoiding exercise, or engaging in dysfunctional practices to attain sociocultural ideals of thinness (Frederick & Shaw, 1995; Tsai et al., 2015).
1.2 Objectification Theory

Objectification theory is a framework that explains how girls and women are sexually objectified (i.e., treated as mere bodies or objects for the pleasure and use to others). Catcalls, photos of women’s body parts or bodies, and leering are more implicit forms of sexual objectification, which can lead to explicit forms such as sexual harassment, sexual violence, and rape (Calogero, 2012). Women and girls come to internalize this objectification through the process of external pressure, interpersonal identification, and individual ownership of these values (Costanzo, 1992). This behaviour can also manifest as constant body surveillance and monitoring of appearance which are usually in comparison to others. Based on theoretical propositions by Fredrickson and Roberts (1997), self-objectification is associated with greater body shame, appearance anxiety, and a reduction in flow experiences and awareness of internal bodily states (Fredrickson & Roberts, 1997; Moradi & Huang, 2008). It has also been proposed that accumulated experiences of objectification contribute to psychological outcomes that are disproportionately observed among women, including eating disorders, depression, and sexual dysfunction and can also impact exercise motives and behaviours (Calogero et al., 2010; Fredrickson & Roberts, 1997; Noll & Fredrickson, 1998; Tiggemann & Williams, 2011).

Eating disorder symptomatology has been reported in women that engage in self-objectification via the process of body surveillance and increased body shame (Calogero, 2009; Jones et al., 2014). In a systematic review, a direct effect of self-objectification on depression in adolescents and a mediated effect among women was suggested (Jones & Griffiths, 2015). Beginning in adolescence, women are more likely to be diagnosed with depression and exhibit more depressive symptoms than men (Girgus & Yang, 2015; Parker & Brotchie, 2010). Self-objectification has also been related to women’s body self-consciousness, body shame and body surveillance during sexual activity which was associated with decreased sexual satisfaction (Claudat & Warren, 2014). Women are disproportionately affected by these mental health risks between the ages of adolescence and middle age, when they age out of the Westernized ideal (Fredrickson & Roberts, 1997). The complete model of objectification theory shows how self-objectification leads
to many mental health outcomes when considering the correlates (Tiggemann & Williams, 2011).

Figure A. Conceptual model of objectification theory reproduced and modified from Moradi and Huang (2008).

1.2.1 Body Shame

Body shame has been found to mediate the relationship between self-objectification and its behavioural manifestation self-surveillance, and eating pathology, according to objectification theory (Calogero, 2009; Dakanalis et al., 2015; Fredrickson et al., 1998). Shame is a moral emotion that can come from not meeting internal or external standards (Lewis, 1992). Experiences of shame often come from negative self-evaluation with the potential for social exposure (Fredrickson & Roberts, 1997). This can lead to a desire to hide or escape the gaze that causes this by engaging in actions and behaviours that limit this experience. This may be seen as an adaptive mechanism. Although, bodies are harder to change which may lead to maladaptive body-based shame when individuals perceive themselves as not meeting appearance ideals. Body shame has been shown to mediate the relationship between self-objectification and depression, disordered eating, and sexual dysfunction (Calogero, 2009; Calogero & Thompson, 2009; Chen & Russo, 2010; Hurt et al., 2007). Appearance anxiety and body shame were significant mediators in the theoretical model of objectification theory (Calogero et al., 2010; Tiggemann & Williams, 2012).
1.2.2 Social Physique Anxiety

Objectification theory also notes that social physique anxiety is a proximal outcome of body surveillance and self-objectification due to the nature of living in a Western culture that constantly induces anxiety around safety and appearance (Fredrickson & Roberts, 1997). Social physique anxiety occurs when one anticipates threat of when and how one’s body will be evaluated. Tension, scanning, and checking can manifest from emotions of anxiety (Fredrickson & Roberts, 1997). Concerns about being possibly surveyed can stem from comments or experiences that question a woman’s physical appearance or physical safety. This is largely impacted by an individual’s belief in their ability to present themselves in a desired and physically attractive manner (Amorose & Hollembeak, 2005). This anxiety can also include concerns about physical safety of exposure to sexual violence and harm. Chronic attentiveness of surroundings, double checking locks, carrying protective weapons and staying in after dark are some strategies women employ for physical safety. In an objectified society, women who are deemed attractive have been construed as threatening and blamed for their own victimization (Beneke, 1982; Fredrickson & Roberts, 1997). This highlights the relationship between sexual violence and sexual objectification. Chronic attentiveness and awareness of appearance and safety impacts many women’s experiences. Social physique anxiety is social anxiety specific to the physique and has been examined in exercise contexts (Hart et al., 1989). Social physique anxiety has been associated with less exercise adherence, body dissatisfaction, low self-esteem, depression, and maladaptive eating and exercise behaviours (Crocker et al., 2003; Diehl et al., 1998; Haase et al., 2002; Treasure et al., 1998). This anxiety has been negatively associated with flow experiences in women who are sedentary (Greenleaf & McGreer, 2006). Social physique anxiety can also fluctuate depending on various scenarios. Women anticipate greater social physique anxiety in mixed-gender and all-male exercise classes compared to female-only classes (Kruisselbrink et al., 2004). These participants also reported higher social physique anxiety and intentions to shorten their workout in response to the environment (Kruisselbrink et al., 2004). Women may change the way they dress or limit exposure to anxiety-inducing environments in order to protect themselves.
1.2.3 Flow

Flow, also known as a peak motivational state, is disrupted by self-objectification which forces women to experience their bodies as objects (Fredrickson & Roberts, 1997). Flow is being fully challenged by mental or physical activity in a voluntary effort to undertake something worthwhile (Csikszentmihalyi, 1990). Individuals that engage in trait self-objectification spend time and mental resources thinking about how they look to others. Female college students completed daily measures of self-objectification and well-being over a period of 14 days which revealed that state self-objectification was associated with decreases in flow states (Breines et al., 2008). An example of state flow could be when you are “in the zone” while running and you do not realize how much time has passed. The peak motivational states of flow when a woman is truly feeling joyful, creative, and uncontrolled by others can be interrupted when attention is placed on her body or appearance. This form of self-consciousness is created when attention is divided from the current activity to be directed at the body and how it may be perceived (Fredrickson & Roberts, 1997). This can be interrupted by use of mirrors or video recordings in exercise settings where the individual is made self-aware and self-conscious of their body. Movement can draw awareness to the body which can create the potential to be objectified (Fredrickson & Roberts, 1997). This takes away from women’s concentration and may hinder their ability to be fully immersed in any rewarding physical or mental task. Flow and exercise enjoyment in exercise environments were present when participants had flexible outcomes, and lower perceived effort (Swann et al., 2019). Through semi-structured interviews, the adult sample found that flow state had an energizing effect compared to states of clutch when performance pressure and stress were present (Swann et al., 2019). Self-objectification led to habitual body monitoring, which led to less flow, greater body shame, and greater appearance anxiety (Szymanski & Henning, 2007). In turn, less flow, greater body shame, and greater appearance anxiety led to depression symptoms among women (Szymanski & Henning, 2007). Overall, this restriction of flow can lead to negative mental health effects among women.
1.2.4 Interoceptive Awareness

The fourth proximal outcome according to objectification theory is reduced interoceptive awareness of the body (Fredrickson & Roberts, 1997). The detection and interpretation of internal physiological sensations (i.e., heartbeat, hunger cues, sexual arousal) from one’s own body, is awareness of internal bodily states. Studies suggest that women are less accurate at detecting internal physiological sensations that men (Harver et al., 1993; Katkin, 1985). Starting in adolescence, girls become familiar with the idea of dieting or ignoring hunger cues because they have been associated with losing weight and maintaining a slim body ideal (Lowes & Tiggemann, 2003). Dieting, restrained eating, and excessive exercise may increase the inability to identify these cues since they largely require active suppression of natural cues from the body. Women who are dissatisfied with their body may try to decrease their shame by engaging in these behaviours in an attempt to lose weight. Another explanation may be that women focus on monitoring their body appearance in an objectifying culture so much that they have less perceptual resources available to attend to these cues (Fredrickson & Roberts, 1997). The relationship between self-objectification and disordered eating has been partially mediated by interceptive awareness (Myers & Crowther, 2008). Interoceptive awareness, using a heartbeat perception task, was negatively correlated with self-objectification in women (Ainley & Tsakiris, 2013). Felig and colleagues (2021) also found that women who were more focused on their appearance did not feel colder in cold weather when wearing less clothing compared to those that were lower in self-objectification. This disconnect from bodily sensations can lead to more serious consequences. As noted, lack of body awareness should generate concern in situations where women are at increased risk of sexual assault such as possibility of not recognizing drugs in drinks or missing cues that warn them of safety concerns (Felig et al., 2021).

1.3 Objectification, Exercise Motivation, and Behaviour

A potential outcome of women’s experiences of objectification is altered exercise behaviours. Places such as fitness centres can induce feelings of self-objectification if they create an environment that emphasizes body appearance and sociocultural ideals. Prichard and Tiggemann (2005, 2008) found that female participants’ time spent
exercising in fitness centres was positively correlated to body image and eating
disturbance compared to exercising outside of fitness centres. Female aerobic instructors
and participants who had higher self-objectification had associated disordered eating
symptoms, body dissatisfaction, and appearance-related reasons for exercising (2005).
Exercising inside a fitness centre, compared to exercising outside of fitness centres,
moderated the relationship between frequency of exercise and self-objectification.
Objectifying features of the exercise environment can cause increased focus on the body
and in turn promote body image concerns.

Most research applying objectification theory to exercise behaviour has focused
on yoga – a specific type of exercise that is intended to be mindful and function-focused.
Although a more intuitive and appreciative space for the body can be fostered with yoga,
reasons for exercise and other environmental factors can impact these experiences.
Changes in self-objectification, body image outcomes, and reasons for exercise were
examined in associations with state mindfulness during yoga classes over 8 weeks (Cox,
Ullrich-French, Cole, et al., 2016). Results showed that women who had higher state
mindfulness during exercise significantly predicted increases in internal reasons for
exercise as well as lowered self-objectification. In another study, mirrors in a yoga
condition resulted in significantly higher state social physique anxiety and appearance
comparisons for young women compared to those in a similar non-mirrored condition
(Frayeh & Lewis, 2018). This exemplifies how environmental factors can impact self-
objectification and exercise experience even when engaging in a function-focused and
mindful exercise activity.

Indeed, researchers have proposed that the psychological benefits of exercise are
contingent on one’s motivations for engagement, whereby exercising primarily for
appearance and weight motives is linked with worsened body image and mental health,
compared to exercising for functional, fitness, and health reasons (Homan & Tylka, 2014;
LePage & Crowther, 2010). Emphasis on functional motives for exercise focus on what
the body is capable of and how the participant feels about the exercise, for example,
feeling more powerful and accomplished after completing a marathon. In contrast,
emphasis on appearance motives for exercise focus on the body as an object to be
enhanced to meet external or internal standards, such as achieving slim and toned legs from running. Exercising for functional, rather than appearance reasons has been linked with more engagement in exercise behaviour in observational studies (Tylka & Homan, 2015). Often, exercising primarily for appearance motives is unsustainable as it is associated with reduced body satisfaction and smaller gains in body satisfaction post-exercise (Fuller-Tyszkiewicz et al., 2018). There is preliminary evidence from lab-based acute induction research that suggests function-based exercise interventions are promising in reducing negative affect and improving psychological and physical benefits in young women (O’Hara et al., 2014). Motivation focused on functionality, strength, and endurance has been associated with positive bodily experiences and higher levels of exercise adherence (Avalos et al., 2005; Quinn et al., 2011).

A previous study experimentally induced appearance-focused motives during a group-based exercise class. O’Hara and colleagues (2014) manipulated the physique evaluative nature of the exercise environment via instructor commentary. It was reported that participants randomized to the class that focused on appearance motives reported greater state self-objectification, compared to participants in a class that relied on functional exercise motives. Women who had stronger health motives for exercise experienced less state self-objectification and state social physique anxiety. This research supported the hypothesis that class emphasis on appearance and lower health reasons for exercise predicts state self-objectification and class enjoyment, however, several limitations are important to note. The sample consisted of highly active women who may have had positive benefits from previously engaging in exercise. In addition, only an appearance condition and a functional motives condition were used. Without a control condition, the effects of the manipulation from other components of the group-based exercise environment cannot be isolated. The group exercise environment may also have affected results. Only state and trait self-objectification, and state social physique anxiety were included as variables related to self-objectification. This limits the understanding of self-objectification and its outcomes in relation to exercise motives. As such, research is needed to examine how appearance versus functional cues during exercise impact the other components of self-objectification and exercise outcomes in non-active women. Understanding how objectifying exercise environments influence exercise experiences
and body image should be considered in reducing negative affect and improving exercise outcomes in young women.

A short bout of aerobic activity was used to extend the past research focused on group-based strength training (O’Hara et al., 2014). Aerobic exercise has been the most studied and employed exercise. With the greatest disseminated guidelines to engage in aerobic activity for a minimum of 150 minutes per week, it is crucial to understand how motives influence aerobic exercise (Canadian Society for Exercise Physiology, 2021). Increases in cardiorespiratory fitness and regular physical activity have been associated with lower depressive symptomatology and greater well-being among adults (Galper et al., 2006). Engaging in moderate-to-vigorous exercise can also elicit negative affective responses due to physical discomfort during exercise and is most common for those that do not frequently engage in exercise (Ekkekakis et al., 2011; Welch et al., 2007). Most studies have looked at habitual exercise which provides greater benefits, but many of these studies have only used trait measures which may be insensitive to acute exercise effects (Martin Ginis et al., 2011). Newer studies have looked at the impact of acute bouts of exercise which can influence state body image indices (LePage & Crowther, 2010). Acute exercise may improve state psychological outcomes and positive affect (Focht & Hausenblas, 2003; Lamarche et al., 2009; Martin & Fox, 2001; Reed & Ones, 2006). However, other factors such as exercise environments and motives that influence body image outcomes are under investigated in this area. A future goal is to assess if specific motives for exercise can improve long-term exercise adherence, enjoyment, and body image in women subjected to self-objectification.

1.3.1 Exercise Motivation

In the area of psychology, motivation is a key component behind exercise behaviours and intentions. Motivation is impacted by many factors like intrinsic values and interests, but also reasons external to the self (Ryan & Deci, 2000). External orientations of motivation can be damaging and lead to dysfunctional exercise behaviours in order to keep up with body ideals (Fredrickson & Roberts, 1997; Greenleaf, 2005). When external pressure to have a specific physical appearance is present, exercising can be a way to change the body physically and maintain a certain physique. The ideals they
are striving for through exercise are often unattainable and lead to disappointment (Lox et al., 2019; Prichard & Tiggemann, 2008). Extrinsic motivations for exercise are those that are performed to achieve outcomes or rewards that are separable from the behaviour itself or to avoid disapproval (Ryan & Deci, 2000). Body-related comments are associated with higher body related motivation for exercise and negatively impact intrinsic exercise motivation (Yan et al., 2021). Specifically, externally regulated motivation is led by external rewards or punishments and in compliance with external causes (Ryan & Deci, 2000). Women who exercise primarily for appearance reasons have experienced higher rates of eating disorder symptoms, elevated depressive symptoms, and lower self-esteem (DiBartolo et al., 2007; Yan et al., 2021). Exercising to improve appearance or fitness could be types of external regulation when considering self-objectification. In turn, indices of self-objectification and exercise experiences may be impacted by these motivations.

Intrinsic motivation is the most internalized and integrated motivation with the self which is the strongest predictor of sustained exercise (Deci & Ryan, 2008; Ryan & Deci, 2000, 2007; Teixeira et al., 2012). Its greatly autonomous and consists of engaging in exercise for the internal experiences of joy, pleasure, satisfaction, and accomplishment (Cox et al., 2019). Perception of physical ability and fitness changes have shown to be more important to body satisfaction than actual changes of objective measures of fitness (Martin Ginis et al., 2012). Women who have positive body image have also used exercise to promote care for their bodies and relieve stress (Wood-Barcalow et al., 2010). Cox, Roberts, Cates, and McMahon (Cox et al., 2018) found that mindfulness during exercise was associated with enjoyment and mindfulness of the body, attentional focus, and positive affective valence. A study that examined resistance training and CrossFit participants found that frequency and weekly volume of exercise were positively related to intrinsic motivation for exercise (Marin et al., 2018). In this study, it was also found that intrinsic motivation along with competence, mediated the relationship between exercise enjoyment and weekly exercise volume. Women who engaged in exercise for enjoyment and health reasons experienced less disordered exercise and eating symptoms (DiBartolo et al., 2007). This was also seen through physical health markers such as lower pulse, systolic blood pressure, and salivary stress hormone (DiBartolo et al., 2007).
Individuals that engage in exercise usually do so with varied degrees of internalization of intrinsic and extrinsic motivations in mind which can predict exercise behaviour differently (Duncan et al., 2010). Understanding how motivations for exercise can affect body image and adherence to exercise is important to research.

1.3.2 Salience of Body Functionality vs. Appearance in Acute Contexts

Self-objectification can be conceptualized as trait, the extent to which women have internalized this outsider perspective and are preoccupied with their physical appearance, or state, a woman’s (temporary) situational awareness of an observer’s actual or imagined perspective of their body and consequent preoccupation with their physical appearance (Fredrickson et al., 1998; Kahalon et al., 2018). When considering the exercise context, it is important to understand that features of the exercise context can induce self-objectification and self-surveillance. Tendency to be self-objectifying, trait, and an objectifying context, state, has been shown to impair cognitive load (Gay & Castano, 2010). For women, wearing a swimsuit led to increased state self-objectification and continuation of thoughts about their body after re-dressing (Quinn et al., 2006). This relationship was mediated by body shame. The study gives insight that women who experience increased shame in a state of self-objectification continue to experience body image threats even after they are no longer in that context.

Exercise instructors often use cues during an exercise session to provide instructions and motivate participants during the exercise. Usually, these motivational cues fall under appearance oriented or health- and function-based motivations. Appearance-based cues commonly promote the message that working hard during exercise will make you skinnier through loss of fat and calorie burning. Function- and health-focused cues are based on promoting exercise to feel physically or mentally strong. One of the main behaviours to foster positive body image and cope with self-objectification is to focus on body functionality. This consists of what the body is able to do, including its physical capabilities, and bodily sensations and perceptions. One study tested a program that improved body image by focusing on body functionality through structured writing assignments (Alleva et al., 2015). Study participants who had negative
body image and were in the intervention group experienced lower levels of self-objectification, greater appearance satisfaction, functionality satisfaction, and body appreciation than the control group. Having a functional view may allow participants to be intrinsically motivated towards exercise which has been associated with higher levels of exercise adherence (Greenleaf, 2005; O’Hara et al., 2014; Quinn et al., 2011). Women in a group exercise class experienced more positive affective experiences when the instructor emphasized health benefits rather than appearance benefits (Raedeke et al., 2007). Adopting a functional standpoint has been associated with higher body satisfaction and higher enjoyment of the exercise activity, which in turn is associated with positive affect (Lox et al., 2019; Prichard & Tiggemann, 2008; Raedeke, 2007; Raedeke et al., 2007). Health- and function-related motivation for exercise may provide an avenue for increased exercise adherence and assist with body image issues.

Appearance-based exercise motivation has been shown to moderate the relationship between exercise frequency and positive body image (Homan & Tylka, 2014). High levels of appearance-based exercise motivation weakened the link between exercise frequency and higher positive body image. Women exercising for appearance reasons such as changing the shape of their body or modifying weight, had higher self-objectification levels and lower levels of exercise adherence (Prichard & Tiggemann, 2005b, 2008). Excessive exercise that is extreme, uncontrollable, and obsessive can result in negative physical and psychological outcomes (Hausenblas & Symons Downs, 2002). It can result in behaviour related to body image disturbance that controls their actions, possibly in hopes of attaining appearance ideals. Appearance-based motivation for exercise and for weight loss were associated with body image concerns in college-aged women (Vartanian et al., 2012). Evidence also suggests that women’s appearance motivation for exercise partially mediates the relationship between low body esteem and eating disorder symptomatology, but health motives for exercise were not related to body esteem nor eating disorder symptomatology in this sample (Vinkers et al., 2012).

Compared to participants engaging in sport, college students who engaged in exercise had motivations that were more extrinsic, focusing on appearance, weight, and stress management (Kilpatrick et al., 2005). Participation in exercise may have less favourable motives than those for sport and should be taken into consideration for habitual exercise.
1.4 Rationale

O’Hara, Cox, and Amorose (2014) examined the effect of appearance- and function-based outcomes in exercise with instructor influence and the effect of participants’ reasons for exercise. Participants were young women (N = 48) randomly allocated to an appearance-focused or health-focused resistance training class. Each class had 2-7 participants and they participated in 30 minutes of exercise, a 5-minute warm-up, 20 minutes of resistance training, and a 5-minute cool-down. Instructors used exercise cues that emphasized either appearance motives (e.g., “Check out those sculpted arms, ladies! We’ll be losing our arm flab in no time!”) or health motives (e.g., “You ladies are so powerful! We’re getting stronger every minute!”). This study was the first to show that experimentally inducing appearance-focused motives during a group-based exercise class was associated with greater state self-objectification, compared with inducing function-focused motives. However, there are some limitations to note. First, the sample consisted of highly active women who were moderately experienced with similar exercise classes, thereby precluding an understanding of how appearance versus functional motives impact exercise outcomes in non-exercisers. Further, the experimental conditions only included an appearance and functional motives conditions, and without a control condition, it is not possible to isolate the effects of the manipulation from other components of the group-based exercise environment. Group based exercise can contribute to increased opportunity for surveillance and add social components to the study environment that may not be accounted for. Finally, only state social physique anxiety and state self-objectification were tested, precluding an understanding of other proposed mechanisms and outcomes that comprise objectification theory (i.e., body shame, internal bodily states, flow).

1.5 Purpose

The purpose of this experiment was to assess the between-person psychological effects of inducing an objectifying exercise environment using appearance- versus function-based verbal cues (appearance, function, and neutral conditions) during an acute bout of aerobic activity on indices of self-objectification and exercise experiences among young adult women non-exercisers. The present study examined the effects of verbal
cues during an acute aerobic exercise task on indices of self-objectification (i.e., body shame, state flow, state interoceptive awareness, state social physique anxiety, and state self-objectification) and exercise experience (i.e., exercise enjoyment, intrinsic motivation, external regulation, and intent to re-engage in exercise) among young adult non-exercising women.

1.6 Hypothesis

It was hypothesized that participants in the appearance-based condition would have higher scores on body shame, state social physique anxiety, and state self-objectification, and lower scores on state flow and state interoceptive awareness, compared to participants in the neutral and function-based conditions. It was also hypothesized that participants in the appearance-based condition would have increased negative experience with the exercise, specifically, higher externally regulated exercise motivation scores, and lower scores of exercise enjoyment, intent to re-engage in exercise, and intrinsic exercise motivation scores than those in the neutral and function-based conditions.
2 Methodology

2.1 Power Analysis

We proposed to recruit a total sample of 102 women in university ages 18 to 25 years old. Power analysis for a MANOVA with three levels and eight dependent variables was conducted in G*Power to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, and a medium effect size ($f^2 = 0.15$; Faul et al., 2009). Based on the aforementioned assumptions, the sample size suggested by the power analysis was 75 (n = 25 per condition). We aimed to recruit 102 participants to account for missing data, failed manipulation checks, and sensitivity analyses.

2.2 Study Design

Participants were randomized into one of three conditions: appearance condition, function condition, and neutral condition. Prior to the completion of data collection, the study methodology was pre-registered on As Predicted (Appendix A).

2.3 Recruitment

The study procedures were approved by the Western University Research Ethics Board in June 2020 (Appendix B). Participants were recruited from Western University. Mass emails were forwarded to the students and recruitment posters were distributed through social media (Instagram, Facebook, Twitter). These invited students to participate in an acute aerobic session examining the psychological experiences of women. People who expressed interest in the study were provided with email contact information to communicate with the investigator.

Participants were eligible to participate in the study if they: (1) identified as a woman, (2) were between the ages of 18 and 25 years old, (3) classified as insufficiently active on the Godin Leisure-Time Exercise Questionnaire (2011), (4) were willing and able to participate in aerobic physical activity (2019 PAR-Q+), and (5) were able to read and
write in English. Participants were excluded if they were: (1) acquainted with the study investigators and/or (2) had a current diagnosis of an eating disorder.

2.4 Materials

2.4.1 Letter of Information and Consent

Interested participants were emailed the letter of information and consent (Appendix C) before the screening phone call. Study information and an explanation of participant consent were explained verbally during the phone call. Participants were advised to read the form and ask questions before agreeing to participate over the phone. Once participants had answers to any questions or concerns, they were able to provide verbal consent. This form was presented at the beginning of the exercise session where they were asked to provide written consent after listening to the investigator verbally explain this information again. A copy of the signed letter of information and consent was provided to the participant to take home.

2.4.2 Screening Call

After participants contacted the investigator, verification of study criteria was completed through phone. Participants completed the eligibility requirement surveys and confirmed their participant data (i.e., age, sex). Upon receiving the information, the Godin Leisure-Time Exercise Questionnaire (Godin, 2011) and Physical Activity Readiness Questionnaire for Everyone (2019 PAR-Q+) were administered to assess if the participants could engage in exercise. Participants who were interested and eligible based on the screening criteria were enrolled until the desired sample of $n = 102$ was reached.

Demographics. During the screening phone call, participants completed demographic questions for eligibility purposes. They were asked if they were enrolled at Western University, able to read and write in English, their age, their gender identity, and if they were currently diagnosed with an eating disorder. Their response had to be “yes” to being enrolled at Western University and “yes” to having the ability to read and write in English. Their age must have been between 18 and 25 years old at the time of
screening. Their gender identity response had to be identified as woman/female. They had to respond with “no” to being currently diagnosed with an eating disorder.

**Godin Leisure-Time Exercise Questionnaire.** To determine if participants were previously insufficiently active, the Godin Leisure-Time Exercise Questionnaire was used (Godin, 2011). This questionnaire asks participants what their exercise patterns are during a typical 7-day period. They reported how many times they participated in strenuous, moderate, and mild/light exercise for more than 15 minutes. The numbers reported were multiplied by 9, 5, and 3 metabolic equivalents (METs), respectively, to create a weekly leisure-time activity score. If participants reported less than 14 units on the scale, interpreted as insufficiently active/sedentary, they passed this inclusion criterion. If they had 14 units or more, they were excluded from participating. The Godin Leisure-Time Exercise Questionnaire is a highly reliable and valid measurement of physical activity levels in healthy adult populations (Amireault & Godin, 2015).

**Physical Activity Readiness Questionnaire for Everyone.** Participants were required to complete the 2019 Physical Activity Readiness Questionnaire for Everyone to determine if they could complete the exercise portion of the study or needed to seek qualified advice before becoming physically active (Warburton et al., 2018). The general health questions were administered to assess if participants were able to engage in the short bout of aerobic exercise. If they said “no” to all the questions, they were cleared to engage in exercise. If they answered “yes” to any of the general questions, follow-up questions from the questionnaire were asked. If they said “no” to all the follow-up questions, they were cleared to engage in exercise. If they answered “yes” to any of the questions in the follow-up, they were not eligible to participate. The Physical Activity Readiness Questionnaire for Everyone is a highly reliable scale to assess if individuals should engage in exercise (Warburton et al., 2018).

### 2.4.3 Survey Assessments

Two surveys were given to the participants during the in-lab exercise session. Survey measures consisted of state self-objectification and exercise experience outcomes (Appendix F).
2.4.3.1 Baseline Assessment

During the second phase in-lab, the baseline survey using Qualtrics was administered prior to the start of the exercise portion. Positively worded body image assessments and filler questions were interspersed throughout the assessment, to avoid priming participants about the true study purpose.

*Demographics.* Additional demographic questions were included that were not considered for eligibility to participate. Participants were asked what year of studies they were currently in, the faculty they were enrolled in, and their racial identity.

*Trait self-objectification.* Participants completed the Self-Objectification Beliefs and Behaviour Scale (SOBBS; Lindner & Tantleff-Dunn, 2017), where they rated their agreement to statements that relate to thoughts and feelings about their body on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores on the scale are associated with higher experiences of self-objectification. This was used to assess individuals’ level of self-objectification prior to the manipulation. The SOBBS has evidence for internal consistency, validity, and test–retest reliability in women (Lindner & Tantleff-Dunn, 2017).

2.4.3.2 Post-Exercise Assessment

After participants completed the exercise portion, they were instructed to complete the post-exercise survey on Qualtrics, which included instruments relating to main study outcomes, interspersed with positively worded body image items that were not included in analyses.

*Body shame.* Participants completed the Body Shame Phenomenology Items as a measure of body shame (Fredrickson et al., 1998). Variables are assessed on a 5-point rating scale from 1 (*not at all*) to 5 (*extremely*) and summed. A higher score reflects greater body shame experienced. Composite body shame scores demonstrate high internal reliability ($\alpha = .91$; Fredrickson et al., 1998). This assessment was administered post-manipulation only.
State flow. The Flow State Scale was used to examine flow immediately following the exercise (Jackson & Marsh, 1996). Participants responded to statements using a scale from 1 (strongly disagree) to 5 (strongly agree). Statements were instructed with prompts about the experiences participants had during the study. They had to think about how they felt during the event and answer using the rating scale. Higher summed scores are associated with higher experiences of state flow. This scale has reasonable internal consistency and acceptable psychometric properties for measuring flow in sport or exercise (M = .83; Jackson & Marsh, 1996).

Exercise enjoyment. Item 1 ("I enjoy it; I hate it") of the Physical Activity Enjoyment Scale (Kendzierski & DeCarlo, 1991) was used to determine the participants enjoyment of the exercise task. This item was rated on a 7-point bipolar rating scale. Use of this item has been most used in literature to assess enjoyment of physical activity. The original scale was validated using the 7-point scale in a population of young adults with high internal consistency and test-retest reliability (M = .83; Kendzierski & DeCarlo, 1991). Use of a shortened version of the scale has been tested in previous research (Gilchrist et al., 2021).

Interoceptive awareness. The State Mindfulness Scale for Physical Activity (Cox, Ullrich-French, & French, 2016) was used to assess experiences of mindfulness immediately following exercise participation. This scale is a 12-item measure with six items assessing state mindfulness of the mind and six items assessing state mindfulness of the body. The responses were rated on a 5-point scale between 0 (Not at all) to 4 (Very much). The bi-factor structure supports the use of using a single score to capture overall state mindfulness, but also the use of two scores (mind and body). Score validity for measuring in a physical activity setting and validity evidence supported use of the measurement (α > .80; Cox, Ullrich-French, & French, 2016).

State social physique anxiety. A state version of the Social Physique Anxiety Scale was used to assess social physique anxiety after the exercise (Martin Ginis et al., 2011). Participants rated statements on a 5-point Likert scale from 1 (not at all) to 5 (a great deal). A total score that was higher, accounting for reverse scored statements,
indicated higher experiences of state social physique anxiety. This measure was tested with groups of young women which provided evidence of construct validity for the state version ($\alpha > .70$; Martin Ginis et al., 2011).

*State motivations for exercise.* The Situational Motivation Scale was used to assess state exercise motivations (Guay et al., 2000). Subscales of interest include intrinsic motivation and external regulation. Items were rated on a 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Questions in each subscale are summed and higher scores represent higher motivation described by the subscale, respectively. Construct validity and internal consistency for the intrinsic motivation subscale was $\alpha = .95$ and the external regulation subscale was $\alpha = .86$ using correlational analyses (Guay et al., 2000).

*State self-objectification.* A modified version of the Twenty Statements Test was used to examine participant state self-objectification (TST; Fredrickson et al., 1998). Participants were asked to complete 20 statements to describe themselves with the prompt, “Who am I?” Statements were categorized as relating to body shape or size and physical appearance. More TST responses related to body shape and physical appearance are related to greater state self-objectification (Aubrey et al., 2009). Participant scores of state self-objectification were the number of statements that were categorized into those groups. Development of this original measure was based on studies with children and university students ($\alpha = .89$; Kuhn & McPartland, 1954).

*Future intentions to re-engage in exercise.* Intentions of engaging in similar exercise was assessed with one item measure likelihood of the participant to exercise in the future from 0% to 100%. This measure is consistent with previous research procedures (Fox et al., 2000; O’Hara et al., 2014; Raedeke et al., 2007).

2.5 Procedure

2.5.1 Study Procedure

A simple randomization protocol via a computer random number generator (randomizer.org) was used to assign participants to conditions. This was necessary to
ensure that the study investigator did not implicitly nor explicitly influence the condition allocation. This provided the study investigator with a list for random allocation into either the neutral, appearance, or function-related condition. Participants were assigned participant numbers in sequential order that the exercise session was completed.

If participants expressed interest, they were emailed the letter of information and consent before the screening phone call. Participants were provided with all study information via the initial screening session, with the opportunity to ask questions before verbally providing consent to participate. Participants went through the eligibility questions with the investigator (demographic questions, GLTEQ, and 2019 IPAQ+). If they were eligible to participate, they were asked to schedule an in-lab exercise session.

The participants completed the exercise session on the university campus. These were individual participant sessions in an exercise lab with only the instructor present. Written consent to the study was collected in person during the exercise session. The investigator verbally instructed participants regarding the consent process and provided consent forms in-lab. Participants signed one form for the investigator and one for themselves. The study was presented impartially to all eligible participants, and structured recruitment scripts were used (Appendix D) to avoid the perception of undue influence during the phone call and at the beginning of the exercise session. Study details were provided to participants in understandable terms, and the study investigator answered any questions raised and ensured that the participants understood all procedures.

Participants were provided with an iPad to complete the baseline Qualtrics survey. This took approximately 15 minutes to complete. When they were finished, they were instructed to step onto the treadmill to complete the 20-minute treadmill portion. The treadmill was positioned so that participants were not exposed to any mirrors. Only the speed and amount of time were shown on the treadmill. The exercise script was used to explain how long the exercise would be and what perceived exertion level was expected. The Borg Rating of Perceived Exertion (Borg RPE; Borg, 1998) scale was used as a subjective measurement of intensity. This consisted of a five-minute warm-up at 2-3 Borg RPE level, 10 minutes at 4-5 Borg RPE level, and a five-minute cool-down at 2-3
Borg RPE level. Light activity was chosen for the warm-up and cool-down to warm up muscles and slowly recover from higher intensity exercise, respectively. Moderate-to-vigorous activity, recommended by the Canadian physical activity guidelines for adults (Canadian Society for Exercise Physiology, 2021), was used during the 10-minute portion so there was no strong physiological effect of the exercise bout on results. RPE was verbally assessed every few minutes by having participants indicate their RPE was at the expected level using a poster placed next to the treadmill. Every minute of the exercise had a corresponding verbal cue to each respective condition.

Three exercise scripts were created for the three conditions in the study (Appendix E). The appearance and function prompts were used in a previous study emphasizing appearance and function outcomes in exercise and were adjusted to follow an acute aerobic exercise task on a treadmill (O’Hara et al., 2014). The neutral script was created following the same format, consisting of time and instructional cues only. The appearance script consisted of cues that emphasized the external appearance of the participant’s body during exercise. The focus was on how exercise could change the body’s aesthetic appearance. The function condition verbal cues emphasized the participant’s feelings of the body in movement. The focus was on how the body physically functions during and after exercise. The neutral condition cues emphasized instruction of the task and track of time only.

Once the exercise portion was complete, participants were given the iPad to complete the post-exercise survey on Qualtrics. This took approximately 20 minutes. After the task, the investigator conducted a funnel debrief to assess if participants were aware of the true study purpose. This was recorded as one of the manipulation checks. Their responses were coded whereby participants were excluded if any answers included connection to appearance/function of the body or knowledge of a verbal script. Participants went through a debriefing explaining the three conditions, which condition they were randomized into, and the purpose of the study (Appendix G). A list of psychological services was offered to all participants. After participants completed the study, they were compensated with $20 CAD. The study was conducted from September

2.6 Analytic Strategy

2.6.1 Preliminary Analyses

Analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 27. Data were examined for assumptions of normality using skewness and kurtosis in addition to boxplots. Absolute values of skewness exceeding +3 or less than -3 were deemed significantly skewed and kurtosis values exceeding +10 or less than -10 were significantly kurtotic (Field, 2018; Kline, 2011). Potential outliers were examined using boxplots for the dependent variables. Assumptions were tested using Shapiro Wilk’s and QQ-plot residuals to determine normality.

After testing assumptions of normality, linearity, and homoscedasticity, data were examined for missing values, and listwise deletion was used for cases where over 5% of values were missing. Expectation–maximization techniques were imputed for all data that were missing at random (Tabachnick & Fidell, 2007). Descriptive statistics, and bivariate Pearson and Spearman correlations were calculated for all study variables. Follow-up univariate analyses were conducted to examine if there were significant main effects across all dependent variables. Univariate outliers were identified as any values that fell +/- 3 standard deviations from the mean, and multivariate outliers were identified by computing the Mahalanobis distance (Mahalanobis, 1936) and using the chi-square value as the cut-off to identify outliers.

2.6.2 Main Analyses

The main analysis consisted of several one-way analysis of variance (ANOVA) models comparing mean differences of each dependent variable (i.e., body shame, state flow, exercise enjoyment, interoceptive awareness, state social physique anxiety, intent to re-engage in exercise, state external motivation, state intrinsic motivation, state self-objectification) by the independent variable (i.e., function condition, appearance condition, neutral condition). Post-hoc comparisons were conducted using Tukey’s HSD.
A secondary analysis consisted of separate analysis of covariance (ANCOVA) models including trait self-objectification as a covariate. The analysis would be retained if the covariate was significant at $p < 0.05$.

2.6.3 Exploratory Analyses

Exploratory sensitivity analyses were also conducted with subsamples of participants. Specifically, a verbal post-survey manipulation check was used to identify participants who correctly identified the true purpose of the study. If participants that guessed that the true purpose included verbal cues during exercise, a verbal script during the exercise, and/or how they noticed the instructor emphasized appearance/function during the exercise, they were removed from the analysis.

In the second sensitivity analysis, participants were grouped based on the perceived purpose of the exercise, rather than the randomized condition. Participants were asked to rate the extent to which they felt the purpose of their exercise task was for improving function or modifying appearance. All participants rated both items on a 5-point scale (1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree). Specifically, participants who scored at least 4 on the functional were allocated to a "perceived functional group" and participants who scored at least 4 on the appearance condition were allocated to a "perceived appearance group," regardless of the assigned condition they were randomized to. If they had the same response to both items, then they were allocated into a “perceived neutral condition.” This sensitivity analysis determined the extent to which perceived exercise purpose versus the manipulation impacted dependent variables.
Chapter 3

3 Results

3.1 Preliminary Data

3.1.1 Data Screening

A total of 175 students expressed interest in participating in the study. Of those interested, 102 participants were included in the analysis after passing the eligibility screening and completion of the in-lab session. Participants were excluded from the analysis if they guessed the purpose of the study correctly or were missing over 5% of values. It was found that 4 participants were missing one of the survey measures, exercise enjoyment, and were removed using pairwise deletion in the ANOVAs. Data were screened for univariate outliers and normality by visually analyzing histograms and computing the Mahalanobis distance. Values for skewness were within the pre-established limits (Field, 2018; Kline, 2011). Therefore, a normal distribution was indicated for variables of interest (Table 2).

Levene’s Test showed unequal variance for exercise enjoyment ($p = .003$) and state social physique anxiety ($p = .018$). Since sample sizes were equal between the three conditions, ANOVAs are robust to this violation.

3.1.2 Missing Data

Data were screened for missing values. Percentages of missingness before calculating individual means were: SOBBS item 4 (1.96 %), SOBBS item 14 (0.98 %), Shame item 18 (0.98 %), Flow item 2 (0.98 %), Flow item 15 (0.98 %), Flow item 24 (0.98 %), S-SPAS item 4 (0.98 %), exercise enjoyment (3.92 %), and purpose for health (0.98 %). Missing values were replaced with computed scores using the appropriate participant’s mean survey score. Four participants were missing scores for the exercise enjoyment item. A total of 98 participants had a full data set after calculations. Study variables means and standard deviations were included in the descriptive statistics (Table 2).
3.1.3 Descriptives

$N = 102$ participants were included in the final analytic sample with demographic variables (Table 1). The appearance-based condition had $n = 34$ participants, the function-based condition had $n = 34$ participants, and the neutral control condition had $n = 34$ participants. The racial identity of the sample was 49% Asian, 33.3% Caucasian/White, 13.7% “Other,” and 3.9% African American. The mean age of the sample was 20.2 years (SD = 2.1) and the mean trait self-objectification score on SOBBS was 3 (SD = 0.7). A SOBBS score of 3 corresponds to the response “neither agree nor disagree” which is the midpoint of the scale. Means and standard deviations were calculated by condition (appearance, function, neutral) for trait self-objectification and post-exercise variables (Table 3).

Table 1. Frequency, Valid Percent, and Descriptives for Demographic Variables

<table>
<thead>
<tr>
<th>Descriptive Measure</th>
<th>Frequency</th>
<th>Valid Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Racial Identity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>50</td>
<td>49.0</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>34</td>
<td>33.3</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>13.7</td>
</tr>
<tr>
<td>African American</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Sciences</td>
<td>24</td>
<td>23.5</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>24</td>
<td>23.5</td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>7</td>
<td>6.9</td>
</tr>
<tr>
<td>Engineering</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Law</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Music</td>
<td>2</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Descriptive Measure | Frequency | Valid Percent (%) |
---|---|---|
Education | 1 | 1.0 |
Information and media studies | 1 | 1.0 |

Year of Study

- First year undergraduate | 31 | 30.4 |
- Second year undergraduate | 25 | 24.5 |
- Third year undergraduate | 10 | 9.8 |
- Fourth year undergraduate | 15 | 14.7 |
- Fifth year or more undergraduate | 2 | 2.0 |
- Graduate Studies | 19 | 18.6 |

Note: “Other” represents racial identity outside of the listed options or two or more races.

Table 2. *Descriptive Statistics for Demographic and Main Study Variables*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>18.0</td>
<td>25.0</td>
<td>20.2</td>
<td>2.1</td>
<td>0.73</td>
<td>-0.57</td>
</tr>
<tr>
<td>Trait SO</td>
<td>1.0</td>
<td>5.0</td>
<td>3.0</td>
<td>0.7</td>
<td>-0.41</td>
<td>-0.23</td>
</tr>
<tr>
<td>Shame</td>
<td>1.0</td>
<td>5.0</td>
<td>2.0</td>
<td>0.7</td>
<td>1.34</td>
<td>1.47</td>
</tr>
<tr>
<td>State Flow</td>
<td>1.0</td>
<td>5.0</td>
<td>3.5</td>
<td>0.6</td>
<td>0.02</td>
<td>0.40</td>
</tr>
<tr>
<td>State Mindfulness</td>
<td>0.0</td>
<td>4.0</td>
<td>2.6</td>
<td>0.7</td>
<td>-0.33</td>
<td>-0.43</td>
</tr>
<tr>
<td>SSPA</td>
<td>1.0</td>
<td>5.0</td>
<td>2.8</td>
<td>0.9</td>
<td>0.28</td>
<td>-0.90</td>
</tr>
<tr>
<td>Intrinsic Motivation</td>
<td>1.0</td>
<td>7.0</td>
<td>4.2</td>
<td>1.4</td>
<td>-0.18</td>
<td>-0.67</td>
</tr>
<tr>
<td>External Regulation</td>
<td>1.0</td>
<td>7.0</td>
<td>2.0</td>
<td>1.2</td>
<td>1.19</td>
<td>0.54</td>
</tr>
<tr>
<td>Exercise Enjoyment*</td>
<td>1.0</td>
<td>7.0</td>
<td>2.7</td>
<td>1.4</td>
<td>0.70</td>
<td>-0.40</td>
</tr>
</tbody>
</table>
Intent to exercise (%)  0.0  100.0  71.3  22.8  -0.63  -0.48
State SO  0.0  20.0  1.04  1.2  1.79  3.76

Note: $M =$ Mean. $SD =$ Standard deviation. SO = Self-Objectification. SSPA = State Social Physique Anxiety. Ratings for trait SO, shame, state flow, state mindfulness, SSPA, intrinsic motivation, external regulation, exercise enjoyment, and future intent to exercise are average scores. *Exercise enjoyment $n = 98$.

Table 3. *Means and Standard Deviations for Self-Objectification and Exercise Variables by Condition*

<table>
<thead>
<tr>
<th>Variables</th>
<th>$F$</th>
<th>$p$</th>
<th>Appearance Condition</th>
<th>Neutral Condition</th>
<th>Function Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait SO</td>
<td>3.08</td>
<td>.050</td>
<td>2.77 (0.73)</td>
<td>3.05 (0.73)</td>
<td>3.19 (0.69)</td>
</tr>
<tr>
<td>Shame</td>
<td>0.33</td>
<td>.721</td>
<td>1.90 (0.66)</td>
<td>2.01 (0.70)</td>
<td>1.98 (0.61)</td>
</tr>
<tr>
<td>State Flow</td>
<td>0.85</td>
<td>.433</td>
<td>3.40 (0.65)</td>
<td>3.60 (0.48)</td>
<td>3.46 (0.59)</td>
</tr>
<tr>
<td>State Mindfulness</td>
<td>2.27</td>
<td>.108</td>
<td>2.39 (0.65)</td>
<td>2.63 (0.65)</td>
<td>2.71 (0.67)</td>
</tr>
<tr>
<td>SSPAS</td>
<td>1.04</td>
<td>.359</td>
<td>2.61 (1.11)</td>
<td>2.93 (0.79)</td>
<td>2.83 (0.90)</td>
</tr>
<tr>
<td>Intrinsic Motivation</td>
<td>1.66</td>
<td>.196</td>
<td>3.98 (1.36)</td>
<td>4.56 (1.35)</td>
<td>4.16 (1.33)</td>
</tr>
<tr>
<td>External Regulation</td>
<td>0.24</td>
<td>.788</td>
<td>2.02 (1.38)</td>
<td>2.07 (1.17)</td>
<td>1.88 (1.11)</td>
</tr>
<tr>
<td>Exercise Enjoyment*</td>
<td>5.16</td>
<td>.007</td>
<td>2.82 (1.42)</td>
<td>2.03 (0.97)</td>
<td>3.09 (1.65)</td>
</tr>
<tr>
<td>Intent to exercise (%)</td>
<td>3.35</td>
<td>.039</td>
<td>63.29 (24.79)</td>
<td>76.12 (21.25)</td>
<td>74.53 (20.52)</td>
</tr>
<tr>
<td>State SO</td>
<td>0.65</td>
<td>.524</td>
<td>0.97 (1.19)</td>
<td>0.91 (1.19)</td>
<td>1.24 (1.35)</td>
</tr>
</tbody>
</table>

Note: $M =$ Mean. $SD =$ Standard deviation. SO = Self-Objectification. SSPA = State Social Physique Anxiety. Ratings for trait SO, shame, state flow, state mindfulness, SSPA, intrinsic motivation, external regulation, exercise enjoyment, and future intent to
exercise are average scores. \( N = 102 \). Between groups degrees of freedom (\( df \)) = 2 and within groups \( df = 99 \). *Exercise enjoyment within groups \( df = 95 \).

### 3.2 Exploratory Analyses

Sensitivity analyses were conducted using the sample size \( n = 88 \) after excluding participants who did not pass the verbal manipulation check (\( n = 14 \)). The appearance condition had 27 participants, the neutral condition had 28 participants, and the function condition had 29 participants. Mean exercise enjoyment scores did not have equal variance as determined by Levene’s Test (\( p = .001 \)), though we proceeded with the analyses given ANOVAs are robust to this violation when sample sizes are equal. After exclusion based on the verbal manipulation check, results were similar to analyses that include the full sample. Only differences in mean exercise enjoyment scores were statistically significant between groups (\( p = .026 \)), whereby the significant difference was in scores of exercise enjoyment between the neutral condition and the function condition (\( p = .019 \)). As such, the full sample was retained for the main analysis.

### 3.3 Main Analyses

Findings from one-way ANOVAs comparing the effects of condition on self-objectification and exercise outcomes are presented in Table 3. Pair-wise contrasts were examined to compare mean scores between conditions (Table 5).

#### 3.3.1.1 Trait Self-Objectification

Mean trait self-objectification was removed from the analysis as it was found to be a non-significant covariate not independently associated with any exercise variables regardless of condition (\( p > .05 \); Table 4). No covariates were included in the analyses.

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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>1. Trait SO</td>
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<tr>
<td>2. Shame</td>
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<td>.511**</td>
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</tbody>
</table>

Table 4. *Bivariate Pearson and Spearman Correlations between Study Variables*
3. State Flow  
-0.052  -0.356**  -

4. State Mindfulness  
0.136  -0.022  0.296**  -

5. SSPAS  
0.556**  0.655**  -0.380**  0.055  -

6. Intrinsic Motivation  
0.091  -0.214*  0.517**  0.365**  -0.025  -

7. External Regulation  
0.108  0.213*  -0.136  0.041  0.308**  -0.123  -

8. Exercise Enjoyment  
-0.101  0.162  -0.416**  -0.203*  0.007  -0.627**  -0.077  -

9. Intent to exercise  
0.135  -0.040  0.449**  0.224*  0.057  0.476**  -0.046  -0.339**  -

10. State SO  
-0.027a  -0.116a  0.013a  0.162a  -0.132a  0.030a  -0.094a  0.086a  0.075a  -

*Note: *p < .05, **p < .001. aSpearman correlations. SO = Self-Objectification. SSPA = State Social Physique Anxiety. Ratings for trait SO, shame, state flow, state mindfulness, SSPA, intrinsic motivation, external regulation, exercise enjoyment, future intent to exercise, and state SO are average scores. N = 102, exercise enjoyment n = 98.

### 3.3.1.2 Body Shame

There was no statistically significant difference in mean body shame between participants in the appearance and function conditions (p = .842), the appearance and neutral conditions (p = .712), nor the neutral and function conditions (p = .972).

### 3.3.1.3 State Flow

Results indicate that there was no statistically significant difference in mean state flow between the participants in the appearance and function conditions (p = .898), the appearance and neutral conditions (p = .410), nor the neutral and function conditions (p = .681).

### 3.3.1.4 Exercise Enjoyment

Results indicate that there was a statistically significant difference in mean exercise enjoyment between two conditions [F (2, 95) = 5.155, p = .007]. There was no statistically significant difference between participants in the function and appearance
conditions \((p = .702)\), nor appearance and neutral conditions \((p = .061)\). Tukey’s HSD Test for multiple comparisons found that the mean value of exercise enjoyment was statistically significantly different between the participants in the neutral condition and the function condition \((p = .007, 95\% \text{ C.I.} = [-1.87, -0.25])\). Participants in the neutral condition reported higher exercise enjoyment \((M = 2.82)\) compared to participants in the function condition \((M = 3.09)\).

### 3.3.1.5 Interoceptive Awareness

Mean interoceptive awareness, state mindfulness, was not statistically significantly different between the participants in the appearance and function conditions \((p = .107)\), the appearance and neutral conditions \((p = .273)\), nor the neutral and function conditions \((p = .874)\).

### 3.3.1.6 State Social Physique Anxiety

Mean state social physique anxiety was not statistically significantly different between the participants in the appearance and function conditions \((p = .604)\), the appearance and neutral conditions \((p = .341)\), nor the neutral and function conditions \((p = .895)\).

### 3.3.1.7 Exercise Motivation

Differences in mean intrinsic motivation between the participants in the appearance and function conditions \((p = .840)\), the appearance and neutral conditions \((p = .182)\), and the neutral and function conditions \((p = .446)\) were not statistically significant.

Differences in mean external regulation between the participants in the appearance and function conditions \((p = .874)\), the appearance and neutral conditions \((p = .984)\), nor the neutral and function conditions \((p = .783)\) were not statistically significant.

### 3.3.1.8 Future Intent to Re-engage in Exercise

One-way ANOVA results suggested a statistically significant difference between two conditions and their mean intent to re-engage in exercise \([F (2, 99) = 3.351, p = .039]\). Although, there was no statistically significant pairwise comparisons between the
participants in the neutral and function conditions ($p = .953$), appearance and neutral conditions ($p = .051$), nor the appearance condition and the function condition ($p = .099$).

### 3.3.1.9 State Self-Objectification

Mean state self-objectification scores were not statistically different between conditions. Differences between the participants in the appearance and function conditions ($p = .856$), the appearance and neutral conditions ($p = .780$), and the neutral and function conditions ($p = .400$) were not statistically significant.

Table 5. *Pair-wise Contrasts of Mean Outcomes between Conditions*

<table>
<thead>
<tr>
<th></th>
<th>Difference in Magnitude</th>
<th>Estimate</th>
<th>SE</th>
<th>95% CI</th>
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<td><strong>Shame</strong></td>
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<tr>
<td>Appearance vs. Function</td>
<td>0.756</td>
<td>-0.08</td>
<td>.159</td>
<td>[-.467, .289]</td>
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<tr>
<td>Appearance vs. Neutral</td>
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<td>.159</td>
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<tr>
<td>Neutral vs. Function</td>
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<td>0.03</td>
<td>.159</td>
<td>[-.342, .414]</td>
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<td><strong>State Flow</strong></td>
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<tr>
<td>Appearance vs. Function</td>
<td>0.667</td>
<td>-0.06</td>
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<td>[-.396, .271]</td>
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<tr>
<td>Appearance vs. Neutral</td>
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<tr>
<td><strong>Mindfulness</strong></td>
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<td>Appearance vs. Function</td>
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<td>Appearance vs. Neutral</td>
<td>Neutral vs. Function</td>
<td>Intrinsic Motivation</td>
<td>Appearance vs. Function</td>
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<td>25.700</td>
<td>1.59</td>
<td>5.400</td>
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<tr>
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*Note: SO = Self-Objectification. SSPA = State Social Physique Anxiety.*
3.4 Summary

In summary, multiple one-way ANOVAs were conducted to compare the effects of condition on self-objectification and exercise outcomes. Trait self-objectification was not adjusted for in the main analyses as it was not significantly correlated with outcome variables of interest. Descriptively, the findings revealed that participants in the neutral and function conditions experienced greater state flow, interoceptive awareness, intrinsic motivation, and intention to exercise in the future compared to those in the appearance condition – however findings were not statistically significant. Participants in the neutral and function conditions had higher scores of body shame and state social physique anxiety, though these differences were also not statistically significant. Participants in the neutral and appearance conditions had higher external regulation compared to those in the function condition, in that respective order, though not statistically significant. Only reported exercise enjoyment between participants in the neutral and function conditions were statistically significant ($p < .001$). The neutral condition participants enjoyed the exercise more than those in the function condition. While not statistically significant, participants in the appearance condition enjoyed the exercise less than those in the neutral condition, but more than those in the function condition.
Chapter 4

4 Discussion

The purpose of this investigation was to examine if inducing a self-objectifying environment, through verbal cues, during an acute exercise task would impact women’s self-objectification and exercise experiences. Participants were randomly assigned to one of three conditions in which verbal cues emphasized appearance motives, function motives or provided neutral instructions only. It was hypothesized that participants in the appearance-based cue condition would experience greater instances of self-objectification and have negative exercise experiences, compared to the participants in the function and neutral conditions. While patterns of effects were in the expected directions, inferential tests did not support the hypothesis that participants who completed an objectifying exercise session on a treadmill report significantly greater negative exercise experiences and indices of self-objectification than those in the function and neutral conditions. The only statistically significant difference found was that participants in the neutral condition reported greater mean exercise enjoyment compared to participants in the function condition. Trait self-objectification was not significantly associated with outcomes of interest and therefore not adjusted for in the main analyses. Results suggest that objectification in the exercise context does not significantly impact self-objectification and exercise experience, but that body-neutrality shows promise for increasing exercise enjoyment for non-exercisers. In light of methodological limitations (e.g., lack of pre-test, potential issues with manipulation conditions; measurement concerns with some state assessments, COVID protocols, etc.), interpretation of findings should be cautiously considered. This study can provide further evidence that the exercise context plays a role in enjoyment further leading to sustaining engagement.

4.1 Self-Objectification Outcomes

In the present investigation, self-objectification was assessed as a state response after an exercise-based manipulation, and a dispositional trait assessed at baseline. Self-objectification can be *trait*, the extent to which a woman has internalized the third-person perspective and values their appearance, or *state*, the situational awareness of possibly
being objectified and preoccupation with their appearance (Fredrickson et al., 1998; Kahalon et al., 2018). Behavioural manifestation of self-objectification can also lead to habitual self-surveillance and monitoring of the body. Accumulation of objectifying experiences has been proposed to contribute to eating disorders, sexual dysfunction, and depression which are detrimental health risks disproportionately seen in women (Fredrickson & Roberts, 1997; Noll & Fredrickson, 1998; Tiggemann & Williams, 2011). Increased body shame and appearance anxiety, and decreased interoceptive awareness and flow are associated with self-objectification (Calogero, 2012; Fredrickson & Roberts, 1997; Roberts et al., 2018).

Trait self-objectification was measured at baseline and tested as a covariate in the analysis. Trait self-objectification mean scores were highest in participants in the function condition, then participants in the neutral condition, and lowest in participants in the appearance condition. Although, these results were not statistically significant. It was removed from the analysis as a covariate as it did not have a statistically significant effect on exercise outcomes. This statistical non-significance is important to consider when examining the exercise outcomes since participants were not habitual exercisers. Trait self-objectification as a whole did not affect whether participants had more positive or negative experiences with exercise.

Statements that regarded body shape or size and physical appearance were used to assess state self-objectification. Participants in all three conditions had similar amounts of self-objectification statements, with participants in the function condition reporting slightly higher amounts of statements. Differences between the participants based on condition was statistically not significant which did not support the hypothesis. State self-objectification was not correlated with trait self-objectification, indices of self-objectification, nor exercise experience. This could be due to the assessment used to measure state self-objectification in an exercise context. Coding of the Twenty Statements Test included statements about body shape and size (e.g., “I am short”), and physical appearance (e.g., “I am blonde”) which may not have examined components crucial in understanding state self-objectification during exercise (Aubrey et al., 2009; Fredrickson et al., 1998). State self-objectification is not only pre-occupation with
physical appearance but viewing oneself as object and internalizing an outsider perspective of the self (Kahalon et al., 2018). Perhaps the function condition cues emphasized attention to the body overall which translated to increased statements about the physical aspects of the body. Valence of statement was not analyzed as self-objectification refers to the extent to which objectification is internalized. In future, inclusion of different measures for state self-objectification might better assess the construct in the exercise context.

Results of the study showed that participants in the neutral and function conditions had higher mean body shame compared to those in the appearance conditions. These results were not consistent with previous findings. Lack of baseline data cannot clarify if baseline body shame differed among participants in these conditions. The exercise environment alone can be viewed as a stressful and judgmental place which may emphasize body image concerns (Prichard & Tiggemann, 2005b, 2008). Shame can be viewed as an adaptive mechanism that can lead to behaviours that limit the stressor creating the feeling. The neutral condition could have caused the participants to feel more conscious of themselves since the instructor was viewing them exercise. Participants may have had increased body shame during the neutral condition as the instructor cues did not promote negative nor positive aspects of the body during exercise. Participants may have felt embarrassed or shameful of their body when they were not given any indications about how the instructor perceived their body. Brief moments when no verbal instructions were given may have fostered an uncomfortable environment and may not have been representative of a common exercise environment. Another explanation could be that the function condition’s emphasis on the body in general contributed to increased feelings of body shame despite being functional and health based. The combination of body emphasis and being observed during exercise may have resulted in increased appearance comparison. This is similar to the effect of mirrors in yoga classes as self-objectification indices were high despite being in a functional and mindful space (Frayeh & Lewis, 2018). Pre-experimental assessments should be incorporated in future studies as well as the association between emphasis on function and negative body image.
Participants in the neutral and function conditions had higher mean state social physique anxiety compared to those in the appearance conditions. These differences were not statistically significant, but were inconsistent with previous literature. Feelings of anxiety can lead to constant tension, scanning and checking the environment for potential threat (Fredrickson & Roberts, 1997). Since the sample consisted of women who did not exercise regularly, participation in the lab environment and exercise activity may have increased their anxiety. Anxiety specifically related to the physique may be emphasized through cues about fitness, strength, and feelings of the body in motion emphasized by the function-based cues. Although the function condition cues did not emphasize body or physique appearance, participants could have associated negative bodily feelings during exercise as a threat and perceive judgement from the instructor. Verbal cues in the function condition bring awareness to the body and the lack of cues could have provided additional area for thoughts about the body in the neutral condition. For prospective studies, perceived threat of body evaluation should be considered as well as actual threat when exercising in an unfamiliar and observed environment.

Mean state flow was higher for participants in the neutral and function conditions compared to those in the appearance condition. This aligns with previous research that shows that disrupted flow is associated with self-objectification and focus on appearance (Fredrickson & Roberts, 1997; Swann et al., 2019). Individuals experience disrupted flow when mental resources and time are taken away from voluntary efforts that are worthwhile (Csikszentmihalyi, 1990). The appearance condition had less flow experiences which may be attributed to divided attention when an individual is concerned about their body and how it may be perceived. Participants in the appearance condition may have viewed their exercise task as more taxing and requiring of effort. Physical effects of objectification were noted when the verbal cues used during the appearance condition task seemed to make the participants increase their treadmill speed. Emphasis on appearance and physique changes from the exercise may have disrupted their attention from being fully “in the zone.” Participants in the neutral condition experienced greater flow compared to individuals in the function condition. If participants are verbally instructed to focus on the body and feeling during the function condition exercise, attention towards those tasks is taken away from other potential rewarding parts of the
exercise (Fredrickson & Roberts, 1997). This may be why the participants in the neutral condition experienced the greatest amount of flow. Additional research should investigate if exercise environments with no verbal cues are most beneficial for increasing flow.

Results show mean interoceptive awareness was higher for participants in the neutral and function conditions compared to those in the appearance condition. This was not statistically significant, but was expected based on previous literature. The function condition cues emphasized feeling of the body in movement. It is possible that the neutral condition allowed for participants to focus on what they felt, such as heartbeat and muscle fatigue, during the exercise when no verbal cues were given. Perceptual resources during exercise in the appearance condition may have been used to think about the body and appearance emphasized by the cues rather than interpreting bodily sensations (Fredrickson & Roberts, 1997). It is also suggested that self-surveillance and appearance checking takes away attention that could be used to interpret bodily cues (Ainley & Tsakiris, 2013; Felig et al., 2021). A state mindfulness measure was used to assess interoceptive awareness. Interoceptive awareness is the detection and awareness of physiological sensations of the body, but feeling present in the mind and body is important when dealing with objectification. Participants in the appearance condition were verbally prompted to think about appearance as valuable and desirable. Time between cues might not have been long enough to process other feelings and thoughts during the exercise. These results provide some support that diminished interoceptive awareness occurs when receiving appearance-based cues during exercise. Further studies should investigate if these results hold true and determine if there is a significant association.

Despite most of the results being not statistically significant, they can be used as a reference for further application and examination of the objectifying exercise environment. As noted in a recent review on state self-objectification experimental studies, examination of these correlates may not only be constrained in the framework of objectification theory (Kahalon et al., 2018). Some of the measures used to examine differences between conditions may not capture the complex nature of self-objectification. Self-objectification comes from experiences of sexual objectification and
valuing the self as an object. Internalization of a third-person perspective has been defined as a crucial component which may not have been measured appropriately in the surveys used. Kahalon and colleagues note that an “observer oriented” (viewed by external other) versus “field oriented” (from participant’s point of view) perspective should be considered when choosing measurements (2018). Observer trauma memories have also been perceived as less anxiety provoking than field oriented (McIsaac & Eich, 2004). It may be complicated to view significant changes in state self-objectification and associated outcomes within 20 minutes of being in an objectifying exercise environment. Future research could examine baseline measures of self-objectification or incorporate additional time points for state measurement during longer periods of exercise to determine if there are significant effects of exercising in an objectifying environment.

Types of verbal cues used during the exercise might not have been reflective of true objectifying statements or emphasized function and health in a way that would naturally occur. Sexual objectification involves the separating of the body, sexual functions and body parts from the person and their identity. The verbal cues used in the appearance condition script were not explicitly sexually objectifying. All scripts were adapted from a previous study that focused on the salience of appearance versus health (O’Hara et al., 2014). Some participants did not notice any abnormalities when spoken to during the exercise and did not show any reaction to the more explicit appearance/function cues. If participants did not recognize objectifying or functional verbal cues, experiences of the exercise environment may not have impacted state outcomes. Rather, accumulation of implicit memories of being objectified or personally momentous experiences of objectification may influence self-objectification. Asking participants to think about their bodies during exercise and focusing on the body as an object may not be observed as a threat to the same degree as more recognizable sexually objectifying stressors. Participants’ personal objectification experiences may need to be considered when assessing if cues elicit experiences of objectification leading to self-objectification especially during exercise.
4.2 Exercise Outcomes

Reported mean exercise enjoyment of participants in the neutral condition compared to those in the function condition were statistically significant. The neutral condition participants enjoyed the exercise more than those in the function condition. This contradicts the hypothesis as participants in the appearance condition did not report the lowest levels of enjoyment. While it has been shown that exercising for functional and health reasons leads to more exercise adherence and enjoyment (Lox et al., 2019; Raedeke, 2007; Raedeke et al., 2007), it is possible that emphasizing the body and feeling of movement during exercise was unenjoyable (Avalos et al., 2005). Bringing attention to uncomfortable sensations like fatigue and muscle tension might cause non-exercisers to experience heightened displeasure of the exercise (Ekkekakis et al., 2011; Welch et al., 2007). Although the intensity of the exercise was at the perceived effort of moderate intensity, a study showed that pleasure declined even when participants were asked to exercise at a speed 10% higher than that of their self-selected speed (Lind et al., 2008). A similar study determined that if participants were told intensity was controlled by the experiment even at the same speed they self-selected, participants reported less autonomy and attenuated levels of enjoyment (Vazou & Ekkekakis, 2009). A combination of functional cues that emphasized the feeling of body in movement and act of exercising at the assigned light-to-moderate intensity may have created an unenjoyable experience for the participants in the function condition. In addition, it is possible the body neutral environment is more enjoyable because it does not emphasize achievement nor evaluation. The appearance and function cues focused on exercise being used to achieve a physical standard or feeling. The neutral condition provided instruction about the activity and time limit only. Literature on body neutrality and mindfulness, where there is no label of negative or positive, may provide evidence to support these results. Neutrality, without heightened engagement of sense and awareness, may allow individuals to understand experiences in an unbiased process that does not directly lead to negative thoughts (Stewart, 2004). A body neutral environment should be investigated in the hopes of providing better enjoyment of exercise and helping women sustain exercise participation.
Intrinsic motivation and external regulation mean scores were compared between conditions, but had no statistically significant difference. Intrinsic motivation was highest for the participants in the neutral and function conditions compared to those in the appearance condition. Participants in the neutral and appearance conditions had higher external regulation compared to those in the function condition, in that respective order. Reported intrinsic motivation scores were consistent with the hypothesis, but external regulation scores were inconsistent with expected patterns for neutral cues. The participants in the appearance condition reported the least intrinsic motivation and higher external regulation. Previous studies confirm that body related comments and appearance reasons for exercise negatively affected participants self-esteem and was associated with higher depression and eating disorder symptoms (DiBartolo et al., 2007; Yan et al., 2021). Verbal commentary that focuses on how the body physically appears after exercise creates higher external motivation that takes away from exercise as a part function and mental health behaviour. This may explain why the appearance condition elicited lower intrinsic motivation and higher external regulation. The neutral group reported higher levels of external regulation in addition to high intrinsic motivation which could be due to the lack of controlled motivation through verbal cues. Most people engage in exercise for more than one reason which is observed by these results. A combination of intrinsic motivation and external regulation could have motivated participants to enroll in the study due to less favorable motivations for engaging in exercise compared to engaging in sport (Kilpatrick et al., 2005). The exercise environment without explicit verbal commentary emphasizing appearance can also induce feelings of self-objectification and may be associated with thoughts about body physique (Prichard & Tiggemann, 2010). It is also possible that promoting specific types of motivation in an acute setting will not have a strong effect on participants if they do not strongly identify with those goals (O’Hara et al., 2014). The verbal cues delivered during the neutral exercise condition may not influence predetermined motivations for exercise since they did not serve to alter the exercise environment. Future research should account for exercise motivation prior to engaging in exercise and post-exercise to account for changes in motivation.
Future intentions to re-engage in exercise was assessed after the exercise task. As expected, participants in the neutral and function conditions reported higher mean future intention to re-engage in exercise compared to participants in the appearance condition. Although the differences were not statistically significant, participants in the appearance condition reporting the lowest intention to re-engage in exercise provides an indication that objectifying environments can affect their experience. Participants’ mean intent to exercise in the neutral condition was 76.1%, 74.5% in the function condition, and 63.3% in the appearance condition. The magnitude of difference between the neutral condition reported mean and appearance condition reported mean was 12.8%. This finding is consistent with the hypothesis and is supported with literature. Functional and intrinsic motivation for exercise has been the strongest predictor of exercise engagement (Deci & Ryan, 2008; Marin et al., 2018; Ryan & Deci, 2007; Teixeira et al., 2012). Exercise cues are commonly used by fitness instructors and trainers to reinforce ideas about exercise and the body. Verbal cues that emphasize other motives besides appearance can help participants understand that exercise is not just for changing the physical body, but also about physical sensation, strength, and mental health. This leads to continued exercise behaviour through intrinsic motives (Greenleaf, 2005; O’Hara et al., 2014; Quinn et al., 2011). Future research should de-emphasize appearance in the exercise context to see if there are long-term effects on exercise engagement.

4.3 Limitations

There are several limitations in the present study. A major limitation is the lack of baseline data prior to the exercise task which limits the results to a between-subjects design. Baseline data were not included as a precaution to not prime participants, but that is a critical limitation. Examining within and between person differences would provide added sensitivity to capture responses to the manipulation. It is uncertain if the effects of the objectifying environment are influenced by differences within participants. Incorporating a within-subjects design or collecting baseline data would be beneficial in substantiating the study results.

The study recruited until the sample size was met which may have bias in who was eligible to participate in the study. Study recruitment took place during the fall and
winter which may have deterred some participants from wanting to participate in an in-person study. Participants had to be available to come to the university campus to complete the in-lab exercise and measures. COVID-19 protocols at the time were implemented which may have affected eligible participants. Participants were required to wear personal protective equipment during the session which may have made them feel uncomfortable. Wearing a face mask and face shield would not typically occur in the exercise setting. Participants also had to complete a rapid antigen test prior to entering the lab which may induce feelings of stress and increased self-consciousness. This additional protocol may impact ecological validity.

In addition, as this was a convenience sample, it mostly comprised of university students enrolled in undergraduate and graduate programs. This sample had specific criteria for inclusion which excluded the potential experiences of non-eligible individuals. Participants had to be in London, Ontario, at the time of study and mainly identified as Asian and Caucasian. Results cannot be generalized to include other educational backgrounds, racial identities, and locations. Previous exercise participation criteria had to be insufficiently active (Godin, 2011) one week prior to the screening call. This measure did not consider if participants had previous exercise experience outside of that one week. Inclusion of a non-exercising sample restricts generalization to active populations. Results were not compared with an equal sample of active women to determine if being insufficiently active influenced reported measures. Future research should account for these differences by including matched pairs or assessing previous exercise experience.

Recruitment emails and posters invited participants to participate in a study examining psychological experiences of aerobic activity. Participants may not have paid close attention to what was verbally said during the exercise task. Social desirability bias could have occurred when completing the survey measures if the participants had an idea about the study’s true purpose. The title of the research labs also implied that the study may be about body image and exercise, but results did not differ after accounting for the manipulation check. It is important to note that the exploratory analysis may indicate that the manipulation was not effective. After accounting for the manipulation check and
participant perceived purpose, results were mostly not statistically significant or were not adequately powered to determine differences among conditions. Adjusting the manipulation check and recruiting more participants would be beneficial to determine if the results are similar in future studies.

Measures used to capture self-objectification and exercise experiences may not have been created for this context or time frame (Kahalon et al., 2018). Measures for body shame, state self-objectification and future intentions to exercise were not specific to state experiences or were short form of longer questionnaires. Further testing of reliability and validity is needed to confirm these measures in acute exercise settings. The state self-objectification measure used, the Twenty Statements Test (Fredrickson et al., 1998), is more often used as a manipulation check and not in exercise settings. Completion rate was low as participant responses varied from 3 to 20 statements. Coding of responses followed previous coding instructions from an experimental study, but was not specific to an exercise context (Aubrey et al., 2009). Additional instructions for completion and coding responses is needed as there were no specified appearance statements that should be included. This study included emphasis on function which was also prevalent in responses, but was not considered in this measure. Other measurements for assessing state self-objectification may be better suited in similar experiments.

The State Mindfulness Scale for Physical Activity (Cox, Ullrich-French, & French, 2016) was used to assess participant interoceptive awareness. This scale does not measure awareness of internal bodily states through the lens of objectification theory which is a limitation. Despite this, this scale was included because it measures state mindfulness of the body and mind in the physical activity context. Mindfulness is an important experience that has been associated with exercise motivation and indices of self-objectification providing its useful role in the exercise context (Cox, Ullrich-French, & French, 2016). Investigation of interoceptive awareness should be considered when exercising as it incorporates attentiveness of the mind and body.

Finally, the manipulation of the exercise environment may not have been targeting the sexual objectification of women and their distinctive experiences with
sexual objectification. Sexual objectification is usually thought to be perpetuated through a male gaze in a Western and patriarchal society (Fredrickson & Roberts, 1997). Female college students that anticipated a male gaze had significantly greater body shame and social physique anxiety compared to participants that anticipated a female gaze (Calogero, 2004). This shows that the person in the exercise environment that delivers the verbal cues may have had an effect on how objectifying the environment was. By having women conduct the in-lab sessions, participants might not have identified the appearance cues as experiences of sexual objectification nor internalized them.

Since the verbal cues used to elicit the objectifying and functional focused environment were adjusted from a previous strength training study, some verbal cues might not have been tailored to an acute treadmill exercise or explicit enough to induce feelings of being sexually objectified (O’Hara et al., 2014). The appearance cues used to target objectification may not have been specific enough to change state experiences of self-objectification. Normative fitness ideals surrounding health and appearance can be conflated in medical practices, exercise environments and on social media. Non-exercisers may interpret function-based cues the same way as appearance-based cues as suggested by similar responses from participants in these conditions. In addition, there was variation in complexity and length of the verbal cues used in the three conditions. Specifically, the neutral cues were brief and succinct instructions compared to more lengthy statements used in the appearance and neutral conditions. In future studies, adjustments to the exercise environment are suggested such as using male instructors, targeting the verbal cues to be more sexually objectifying, and matching the condition scripts more precisely.

4.4 Future Research

Recommendations for future research examining the impact of objectifying exercise environments can be made from this study’s results. Consideration of other mediators is crucial in understanding the relationships shown and may explain why there are non-statistically significant results. Measures such as baseline indices of self-objectification, exercise motivation, perceived body size, and previous exercise experience could be assessed. Controlling for participants’ previous experiences of
exercise and objectification would be beneficial to examine within-person effects. An important limitation associated with a lack of baseline data is that causality cannot be determined and should be examined in future. Additional research should explore if these results hold true and assess if there is a significant effect of the exercise environment.

A strength of the study was presence of more diverse racial experiences which should be further examined. Additional inclusion of diverse samples is important in understanding the effects of objectification and psychological experiences during exercise. As noted in previous literature, objectification may affect women of colour in different ways compared to most commonly understood by Caucasian women (Schaefer et al., 2018). Determining if these results were impacted by racial or ethnic influences would be a next step to add to the growing literature.

Further suggestions are to investigate the association between body-neutral exercise and enjoyment. The neutral condition cues showed the most potential for a positive exercise experience and less indices of self-objectification. Understanding what type of environment and features of the environment are important to help women who are starting to exercise feel comfortable and want to continue participation. Future studies should draw from the literature on body neutrality and mindfulness. Neutrality and mindfulness may be a promising approach to treat body image concerns (Stewart, 2004). A body neutral environment that is not negative nor positive should be investigated in the exercise context to provide a space for increased enjoyment of the exercise and hopefully lead to long-term engagement. Addition of matched-pairs or within-group methodology may provide more evidence to support body-neutrality for insufficiently active women.

Another recommendation is to incorporate additional time points of state measure collection during exercise as state experiences may change between the start and the end of exercise participation. The 20-minute bout of exercise used in the current study may not have been long enough to cause changes in experience. This may be examined by having participants exercise for longer, complete added baseline measures, or assess participants’ previous experiences of sexual objectification.
Future studies should look to reduce the limitations found in this study. Conducting this study in a realistic exercise setting without COVID-19 protocols may change the results and provide a better understanding of the objectifying exercise context. Change of measures used to examine state self-objectification, body shame and interoceptive awareness may be beneficial for understanding these outcomes in the exercise context. Additional instruction and guidelines for the Twenty Statements Test should be considered to help researchers distribute and examine state self-objectification most accurately. Investigation and potential modification of the verbal cues used during the exercise task should be considered as they did not elicit the expected responses. Specifically targeting experiences of objectification through the male gaze and sexually objectifying comments may change these results. Participation in objectifying exercise contexts over an extended period of time should be examined.

4.5 Conceptual Implications

These results support components of the relationship between self-objectification and proposed exercise outcomes in women. Appearance-based cues during exercise lead to generally worsened outcomes and experiences for those participants, although not statistically significant. Research in the area of self-objectification and exercise is limited in the field of experimental studies. Although there are some significant studies that looked at the objectifying exercise environment, most have included active samples of women and are not specific to aerobic activity (O’Hara et al., 2014). The present study adds to the literature by offering an understanding of young non-exercising women’s experiences with exercise.

In addition, the sample consisted of over 50% of women that identified as Asian, “other,” 2 or more races, or African American. Most research in the area of self-objectification and exercise focuses on the experiences of Caucasian women and is limited in its application to diverse populations. As noted in previous research, Black women have reported lower levels of disordered eating and self-surveillance (Schaefer et al., 2018). Women with different ethnicities and races may experience self-objectification in various degrees. The analysis of results did not include race as a covariate, but the
sample size consisting of more women of colour may provide additional evidence for racial or ethnic differences in experiences of self-objectification in exercise.

Kahalon and colleagues researched experimental studies on state self-objectification which provides some insight into why not all associations were statistically significant (2018). Despite not showing statistically significant differences between most outcomes and condition, results contribute to the understanding of the proposed model of objectification theory. The present study examined flow and interoceptive awareness which have been less commonly studied as outcomes of self-objectification.

4.6 Practical Implications

Self-objectification is a common experience for many girls and women that live in a Western society (Fredrickson & Roberts, 1997; Moradi & Huang, 2008). Pressure to have a thin and toned physique leads many women to engage in exercise for appearance reasons or avoid exercise altogether (Moradi & Huang, 2008; Tsai et al., 2015). Consideration of the exercise environment and the effect objectification has on daily experiences is important in understanding how women can have positive experiences with exercise; further leading to sustained engagement and affective outcomes.

These results have implications for application in different settings that prescribe or promote exercise such as clinical, kinesiology, and exercise contexts. Many medical professionals, psychologists, exercise trainers and coaches can apply the results in their practices. Focus on appearance in an objectifying environment may foster negative experiences with exercise as seen by reduced enjoyment and future intentions to engage in exercise. This study provides preliminary evidence to support the use of function and neutral language in these settings to sustain participation in exercise and help women achieve the benefits associated with habitual exercise. Motivation emphasized by the instructor has the potential to change outcomes (O’Hara et al., 2014; Raedeke et al., 2007).
It is novel to see that engaging in exercise without use of explicit motivation shows that participants rate their exercise enjoyment higher compared to when they are exercising with functional or appearance motivated settings. Absence of commentary may also be implemented as a method to introduce newer exercisers to the habit of exercise without emphasizing increased discomfort of new body sensations or external motivations. Encouragement unrelated to appearance motives can reinforce more adaptive motivations for exercise and may create positive experiences that lead to long-term behaviour.

4.7 Conclusion

Self-objectification is a prevalent issue in women’s lives which can lead to negative mental and physical health risks (Fredrickson & Roberts, 1997; Moradi & Huang, 2008). Engagement in exercise has multiple social, physical, and psychological benefits, but women may be participating at a much lower rate compared to men (Armstrong et al., 2018; Craft & Perna, 2004; Macera et al., 2003; Warburton et al., 2006). Research has not thoroughly examined the causal effects of objectifying exercise environments on young insufficiently active women that deal with self-objectification. Experiences of objectification via verbal appearance related cues in the exercise context was hypothesized to contribute to indices of self-objectification and negative exercise experience. Although not statistically significant, participants in the appearance focused condition and function focused condition tended to report negative experiences with exercise and higher indices of self-objectification compared to participants in the neutral condition. The only statistically significant difference was participants in the neutral condition experienced greater exercise enjoyment compared to those that were in the function-based condition. The objectifying exercise environment did not significantly impact self-objectification nor the psychological experiences of exercise for non-exercising women. Results suggest that the body-neutral exercise context may be the most enjoyable space for beginner exercisers. Fostering of a body-neutral exercise environment may be beneficial in practice to improve women’s exercise experiences.
References


Image, 9(3), 311–317.  

https://doi.org/https://doi.org/10.1016/j.bodyim.2010.10.001


Appendix A: As Predicted Pre-Registration

CONFIDENTIAL - FOR PEER-REVIEW ONLY

Appearance- versus function-based verbal cues during exercise (#78191)

Created: 10/27/2021 10:30 AM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer review. A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

1) Have any data been collected for this study already?
It's complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

2) What’s the main question being asked or hypothesis being tested in this study?
The goal of the experimental study is to assess the between-person psychological effects of appearance- versus function-based verbal cues (appearance, function, and neutral conditions) during an acute bout of aerobic activity on indices of self-objectification (i.e., body shame, state flow, awareness of internal bodily states, state social physique anxiety, and state self-objectification) and exercise experiences (i.e., physical activity enjoyment, intrinsic motivation, external regulation, and intent to re-engage in exercise,) among young adult women non-exercisers. Non-exerciser criteria is based on meeting the cut-off of 13 units or less (defined insufficiently active/secondary) on the Godin Leisure-Time Exercise Questionnaire (Godin, 2011).

It is hypothesized that, compared to function and neutral conditions, participants in the appearance condition will have higher scores on body shame, state social physique anxiety, self-objectification, and external motivation, and lower scores on state flow, awareness of internal bodily state experiences, physical activity enjoyment, intent to re-engage in exercise, and intrinsic motivation.

3) Describe the key dependent variable(s) specifying how they will be measured.
Primary outcomes to be tested and collected using Qualtrics surveys:

- Body shame, measured using the Body Shame Phenomenology Items (Fredrickson, Noll, Quinn, Roberts, & Twenge, 1998). Variables are assessed on a 5-point rating scale from 1 (not at all) to 5 (extremely) and summed. A higher score reflects greater body shame experienced. Administered post-manipulation only.
- State flow, measured using the Flow State Scale (Jackson & Marsh, 1996). Participants responded to statements using a scale from 1 (strongly disagree) to 5 (strongly agree). Higher summed scores related to higher experiences of state flow. Administered post-manipulation only.
- Physical activity enjoyment, measured using items 1 (“I enjoy it! I hate it!”) and 4 (“I find it unmeasurable. I find it unmeasurable”) of the Physical Activity Enjoyment Scale (Knaggs & DeCarlo, 1992). This is a 7-point bipolar rating scale. Administered post-manipulation only.
- Awareness of internal bodily states, measured using the State Mindfulness Scale for Physical Activity (Cox, Littler-French, & French, 2016). This scale 12 item measure with six items assessing state mindfulness of the mind and six items assessing state mindfulness of the body. The responses were rated on a 5-point scale between 0 (Not at all) to 4 (Very much). The bi-factor structure supports the use of using a single score to capture overall state mindfulness, but also the use of two scores (mind and body). Administered post-manipulation only.
- State social physique anxiety, measured using the State Social Physique Anxiety Scale (Giris, Murrin, Colin, & Strong, 2012). Participants rated statements on a 5-point Likert scale from 1 (not at all) to 5 (a great deal). A total score, accounting for reverse scored statements, was higher indicated higher state social physique anxiety. Administered post-manipulation only.
- State motivation for exercise, measured using the Situational Motivation Scale (Guay, Vallerand, & Blanchard, 2009). Subscales of interest include intrinsic motivation and external regulation. Items were rated on a 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Questions in each subscale are summed and higher scores represent higher motivation described by the subscale respectively. Administered post-manipulation only.
- State self-objectification, measured using the Twenty Statements Test (Noll & Fredrickson, 1998). Participants are asked to complete 20 statements to describe themselves. More statements related to body shape and physical attributes are related to greater state self-objectification. Administered post-manipulation only.
- Future Intention to re-engage in exercise, measured with a 1-item measure rating likelihood of the participant to exercise in the future from 0% to 100%. Administered post-manipulation only.

4) How many and which conditions will participants be assigned to?
Participants will be randomized into one of three experimental conditions: appearance condition, function condition, and neutral condition. All participants in each condition will participate in an individual 20-minute treadmill session (5 minute warm up, 10 minutes moderate intensity, 5 minute cool down).
This will determine which verbal script the researcher uses to instruct participants during the bout of aerobic exercise.

- Appearance script: Verbal cues emphasizing external appearance of the participant’s body during exercise, focus on how exercise will change body’s aesthetic appearance (e.g., “This is the last minute of exercise, so burn every last calorie now.”)
- Function script: Verbal cues emphasizing the participant’s feelings of the body in movement, focus on how the body will physically function after exercise. (E.g., “This is the last minute of exercise, so focus on the support and power your body is providing you.”)

Available at https://aspredicted.org/SMR_QWK
Appendix B: Western Health Science Research Ethics Board Study Approval

Date: 15 June 2020
To Dr Eva Pila
Project ID: 115480
Study Title: Appearance- versus function-based verbal cues during exercise in young female non-exercisers
Application Type: HSREB Initial Application
Review Type: Delegated
Meeting Date / Full Board Reporting Date: 07/Jul/2020
Date Approval Issued: 15/Jul/2020
REB Approval Expiry Date: 15/Jul/2021

Dear Dr Eva Pila,

The Western University Health Science Research Ethics Board (HSREB) has reviewed and approved the above mentioned study as described in the WREM application form, as of the HSREB Initial Approval Date noted above. This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

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No deviations from, or changes to, the protocol or WREM application should be initiated without prior written approval of an appropriate amendment from Western HSREB, except when necessary to eliminate immediate hazards to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University HSREB operates in compliance with, and is constituted in accordance with, the requirements of the TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB00009490.
Please do not hesitate to contact us if you have any questions.

Sincerely,

Patricia Surgeant, Ethics Officer (pouge@iuow.ca) on behalf of Dr. Philip Jones, HSRBB Vice-Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).
Appendix C: Letter of Information and Consent

RESEARCH STUDY CONSENT FORM

Project Title: Examining the psychological experiences of aerobic exercise in inactive women

Researchers:
Principal Investigator: Eva Pila, PhD
Co-investigators: Jenna Gilchrist, PhD, Anne Cox, PhD
Student Investigator: MacLean Press, MA Candidate

You are invited to participate in a research study that will be conducted under the direction of Dr. Eva Pila. The study procedures will be executed by the student investigator, MacLean Press. This consent form provides you with information in order to make an informed decision regarding this research study and your part in it if you choose to participate. Please read the form carefully and contact the student investigator if you have any questions. If you decide to join the study, you have the option of changing your mind at any time. You may decide not to take part in the study or quit the study without penalty.

Inclusion Criteria
- Female between the ages of 18-25 years old
- Able to read and communicate in English
- Do not regularly engage in physical activity/exercise
- Able and willing to engage in a short session of physical activity

Approximately 75 participants will be enrolled in this study.

What is this study about?
The purpose of this study is to investigate the different psychological experiences that arise from aerobic exercise.

What will I be asked to do in this study?
This study consists of:
- A phone call to ensure eligibility criteria, provide study information, and seek consent to participate. This will take approximately 15 minutes to complete. During this phone call, we will ask about your physical activity patterns, ability to engage in exercise, and confirm basic demographic information (i.e. gender, age, etc.).
- An in-person lab session which will consist of pre-exercise surveys, a brief physical activity session on a treadmill, and the completion of surveys about your experience.

If you meet inclusion criteria, we will arrange a time for you to come participate in one exercise session during the phone call or by email. Written consent to participate will also be asked at the beginning of the in-lab session. The exercise session will consist of 5 minutes of warm-up, 10 minutes of jogging/running and 5 minutes of cool-down in a treadmill. Following the exercise, you will complete survey assessments about how you felt about the class, about yourself and exercise participation. In total, this lab session should take approximately 70 minutes.
Are there any benefits to me if I participate?

There are no direct benefits for choosing to participate in this study. You may enjoy the physical exercise and/or find the session useful to you.

Are there any risks to me if I am in this study?

You may feel uncomfortable answering sensitive questions about your emotions and self. If you experience any distress from a question or do not wish to answer it, you may leave the question blank without penalty or loss of credit. You should also know there are no wrong or right answers.

You are also free to withdraw from the study at any time and for any reason without penalty.

Will my information be kept private?

The data for this study will be kept confidential. There is a risk of loss of confidentiality if your information or identity is obtained by someone other than the investigators, but precautions will be taken to prevent this from happening. A randomized number will be linked to your email address and first name, which will be on a master list. This master list will only be accessible to the principal investigator and student investigator of the study. Data will be kept in a locked filing cabinet if in paper format and online data will be kept on a password protected desktop in the PI’s office. The confidentiality of your electronic data created by you or by the researchers will be maintained as required by applicable law and to the degree permitted by the technology used. Absolute confidentiality cannot be guaranteed.

The data will be kept for 7 years in accordance with Western University policy. Representatives of Western University Health Sciences Research Ethics Board may require access to your study-related records to monitor the conduct of research.

We may use the de-identified research information for future research studies or share de-identified information with other investigators here or at other institutions for future research without your additional informed consent. Before we use or share your information, we will remove any information that shows your identity.

Who can I contact for further information?

If you would like to receive any further information regarding this research or your participation in the study, you may contact the principal investigator Dr. Eva Pila or the student investigator MacLean Press.

For any questions regarding the conduct of the study, or your rights as a research participant, you may contact the Office of Human Research Ethics at Western University, 519-661-3036, or ethics@uwo.ca.

Are there any costs or payments for being in this study?

If you participate in phase 1 and phase 2 of the study, you will receive $20.00 in cash.

What are my rights as a research study volunteer?

Version Date: 5 June 2020
Your involvement in this research study is completely voluntary. You may decide not to be a part of this study at any time. There will be no penalty if you choose not to take part or quit at any time.

You will be able to withdraw your data at any time prior to completion of the final report. After the final submission of data your individual data cannot be removed.

**What does providing consent mean?**

- You understand the information given to you on this document
- You have been able to ask the researcher questions and state any concerns
- The researcher has responded to your questions and concerns
- You believe you understand the research study and the potential benefits and risks that are involved.
Statement of Consent
I give my voluntary consent to take part in this study.

Participant number: ___________________

Participant printed name: ___________________

Signature of participant: ___________________ Date: ___________________

Witness
I have witnessed an accurate and clear reading of the consent form to the potential participant, and an opportunity to ask questions was provided. I confirm that the participant has been informed properly and has voluntarily consented to participate.

Witness printed name: ___________________

Signature of witness: ___________________ Date: ___________________

Statement of Person Obtaining Informed Consent
I have carefully explained to the person taking part in the study what she can expect. I certify that when this person signs this form, to the best of my knowledge, she understands the purpose, procedures, potential benefits, and potential risks of participation.

I also certify that she:
- Speaks the language used to explain this research
- Reads well enough to understand this form or, if not, this person is able to hear and understand when the form is read to her
- Does not have any problems that could make it hard to understand what it means to take part in this research.

Signature of Person Obtaining Consent ___________________ Date ___________________

Printed Name of Person Obtaining Consent ___________________ Role in the Research Study ___________________
Appendix D: Recruitment Script

Phase 1 Telephone Script

(To be used after potential participant has confirmed interest with researcher)

Hi, [insert the name of the potential participant here] I’m MacLean Press. I will be the student investigator conducting the procedures during this study on the psychological experiences of aerobic exercise. I will go over a description of what the study entails and what is required of you. Interrupt me at any point if you need clarification or have questions.

As a reminder, this study invites you to participate in a short aerobic workout session on a treadmill. This will consist of two phases, one of which will be completed today. The session today consists of screening questions to determine if you are eligible to participate. If you agree to participate, a second session will be scheduled where written consent will be asked. The second phase will be completed in the Exercise Health and Psychology Lab on campus at Western University. This session today will take approximately 15 minutes to complete. The second phase will be 10 minutes to complete pre-exercise questions, 20 minutes on the treadmill and 40 minutes to complete the post-exercise survey.

We will be recruiting 75 women for this study. You will be assigned a random number that will be your identification for the study. There may not be any potential benefits that come from this other than engaging in exercise or finding the session helpful in any way. Some potential risks are that there may be questions that make you uncomfortable. There is a risk of loss of confidentiality, but precautions are taken to prevent this from happening. Only the main researchers will be able to access personally identifying information.

Involvement in the research study is completely voluntary. You can decide not to be a part of this study at any point. There will be no penalty if you choose not to take part or quit. Providing consent to participate means that you understand the information given just now and in the letter of consent that was forwarded to you. You understand the potential benefits and risks that are involved. You have asked and received any answers to questions that you have.

Do you have any questions or concerns? [Answer]
Please read the consent form I have sent carefully.

Version Date: 05/06/2020
I will ask for your written consent at the beginning of the in-lab session. You will receive a copy of the signed form if you consent.

Today we will complete the screening questions. Let me know if I can answer any further questions now, or at any other time.

Do you attend Western University? ______________   *must be yes

Are you able to read and write in English? _____ *must be yes

How old are you? ______________   *must be 18-25

How do you identify? F, M, etc. ______________   *must be female

Have you been currently diagnosed with an eating disorder? ______________   *must be no

During a typical 7-Day period (a week), how many times on average do you do the following kinds of exercise for more than 15 minutes during your free time?

Strenuous exercise (running, jogging, hockey, soccer, judo, swimming)_________ x 9 = _______

Moderate exercise (baseball, tennis, fast walking, easy bicycling)_________ x 5 = _______

Mild/light exercise (archery, fishing, bowling, golf, yoga)_________ x 3 = _______

Total = ______   *under 14 for inclusion

Next is a yes or no survey to assess if you are ready and able to participate in exercise. *Must answer No for all

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has your doctor ever said that you have a heart condition or high blood pressure?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Version Date: 05/06/2020
Do you feel pain in your chest at rest, during your daily activities of living, or when you do physical activity?  
Do you lose balance because of dizziness or have you lost consciousness in the last 12 months? (Answer NO if your dizziness was associated with over-breathing, including during vigorous exercise)  
Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)?  
Are you currently taking prescribed medications for a chronic medical condition?  
Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? (answer NO if you had a problem in the past, but it does not limit your current ability to be physically active)  
Has your doctor ever said that you should do only medically supervised physical activity?  
*If answered no to all questions above, cleared for physical activity, skip next table*

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have arthritis, osteoporosis or back problems? (or not currently taking medication for this)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you currently have Cancer of any kind?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have a heart of cardiovascular condition? (Coronary artery disease, heart failure, abnormal heart rhythm) (or not currently taking medication for this)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have high blood pressure? (or not currently taking medication for this)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have any metabolic conditions? (Type 1 or 2 diabetes, prediabetes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have any medical health problems or learning difficulties? (Depression, eating disorder, anxiety disorder, Psychotic disorder) (or not currently taking medication for this)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have respiratory disease? (Chronic obstructive pulmonary disease, asthma, pulmonary high blood pressure) (or not currently taking medication for this)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have spinal cord injury?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you had a stroke? (inc. transient ischemic attack or cerebrovascular event)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Version Date: 05/06/2020
Do you have any other medical condition not listed above or two or more medical conditions?

*If answered no to all questions above, cleared for physical activity

[Determine if eligible based on criteria before further questioning]

*If not eligible  Thank you so much for your time. Unfortunately, based on the information you provided you are unable to participate based on the inclusion criteria.

*If eligible

Okay, thank you for answering my questions. You have passed the screening. Do you have any questions about what happened today? [Answer any questions they may have]

When would you like to come in for the second session? [Discuss a time to come into the lab for the second session]

Great that is all I need! Thank you so much for your time! I will follow up with a reminder email for the second phase. Have a nice day!
Appendix E: Exercise Condition Scripts

Introductory script:

Welcome to the exercise session today! You will be doing a 10-minute session on the treadmill today, along with a 5-minute warm-up and cool-down. You will choose your own pace on the treadmill – the goal is to hit certain targets of intensity using a personal rating of perceived exertion scale. This is the Borg Rating of Perceived Exertion Scale which will be used to help you keep track of your speed. Here it shows different levels of perceived exertion during exercise. You will be asked to be at levels of 2-3 during warm-up and cool-down and between 4-5 during the 10-minute portion. It is up to you to decide what speed you will need to select based on the intensity described. Take a look to see how each level is described. I will ask you every 2 minutes to make sure you are keeping the same level of exertion expected during each exercise. Let me know if you have any questions or need assistance.

Script Outline-Appearance Focus

<table>
<thead>
<tr>
<th>Greeting:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “Today we are going to burn up those calories and turn our flab into tight, sculpted, &amp; toned muscles!”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minute 1:</strong> “First, we are going to do a quick warm-up to kick-start that calorie burn! The more calories we burn, the faster we burn fat!” “Go ahead and start walking at a comfortable speed”</td>
</tr>
<tr>
<td><strong>Minute 2:</strong> “We are now going to move on to a quicker pace now, remember our goal is to burn as many calories as possible. The harder we push the quicker we burn that fat!”</td>
</tr>
<tr>
<td><strong>Minute 3:</strong> “Go ahead and keep up that pace between 2 and 3 on the scale. Suck that stomach in and stand tall, you’ll look 5lbs lighter!”</td>
</tr>
<tr>
<td><strong>Minute 4:</strong> “Use your arms to burn that jiggle you hate”</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Minute 5: “We are going to finish our warm-up with one more minute at this pace. This is your last chance to spike that calorie burn!”</td>
</tr>
<tr>
<td>1. “We are going to start our main workout now.”</td>
</tr>
<tr>
<td>Minute 1:</td>
</tr>
<tr>
<td>1. “This is great for firming up that butt and slimming down those legs!”</td>
</tr>
<tr>
<td>Minute 2:</td>
</tr>
<tr>
<td>1. “As you run, make sure you are keeping your abs tight! We can still work that six-pack even while on the treadmill!”</td>
</tr>
<tr>
<td>Minute 3:</td>
</tr>
<tr>
<td>1. “Make sure you are keeping your body tight. The harder you work, the tighter you’ll get!”</td>
</tr>
<tr>
<td>Minute 4:</td>
</tr>
<tr>
<td>1. “The harder it is for you, the faster you’ll see results!”</td>
</tr>
<tr>
<td>Minute 5:</td>
</tr>
<tr>
<td>1. “Remember: The more we sweat, the more fat we burn, getting us closer to that weight loss goal!”</td>
</tr>
<tr>
<td>Minute 6:</td>
</tr>
<tr>
<td>1. “Do you feel that burn? It’s like the fat is just melting off of our thighs!”</td>
</tr>
<tr>
<td>Minute 7:</td>
</tr>
<tr>
<td>1. “Remember to always suck in that belly! We’re still working that 6-pack even though you’re at a faster speed”</td>
</tr>
<tr>
<td>Minute 8:</td>
</tr>
<tr>
<td>1. “Your thighs are going to be the envy of everyone at this rate!”</td>
</tr>
<tr>
<td>2. “The more you do, the closer you get to the body of your dreams!”</td>
</tr>
<tr>
<td>Minute 9:</td>
</tr>
<tr>
<td>1. “We’re almost there! Keep your slimming posture!!”</td>
</tr>
<tr>
<td>Minute 10:</td>
</tr>
<tr>
<td>1. “This is the last minute of exercise, so burn every last calorie now!”</td>
</tr>
</tbody>
</table>
### Cool-down

1. “Now that we finished transforming our bodies, we are going to do a brief cool-down to wrap up.”

#### Minute 1:

1. “Just starting our cool down now! Just think about how good your legs will look once we are done!”

#### Minute 2:

1. “While we are doing this, I really want you to focus on that belly. Can you imagine those tight, toned abs yet?”

#### Minute 3:

1. “Soon you’ll have slim legs!”

#### Minute 4:

1. “We’re almost done! This is the last minute of exercise, so you better make sure you get the results you want!”

#### Minute 5:

1. “You are all done and closer to your ideal body!”

### Closing:

“Thank you for coming! Go ahead and step off the treadmill now and we will move on to the final portion of the study.”

---

### Script Outline-Function Focus

#### Greeting:

2. “Today we are going to work our muscle groups to improve our strength and endurance!”

#### Warm-up
**Minute 1:** “First, we are going to do a quick warm-up to get those muscles ready to work!! Go ahead and start walking at a comfortable speed”

**Minute 2:** “We are now going to increase our pace, remember our goal is to warm up and prepare our muscles”

**Minute 3:** “Go ahead and pick up the pace. Feel your muscles working!”

**Minute 4:** “Use your arms to engage your upper body”

**Minute 5:** “We are going to finish our warm-up with one more minute at this pace. Make sure your muscles feel prepared!”

---

**Exercise**

2. “We are going to increase our pace between 4 to 5 on the scale now.”

**Minute 1:**

2. “This is great at strengthening those legs because you are working the muscles together to execute these movements!”

**Minute 2:**

2. “Make sure you are protecting your lower back from injury by keeping your core strong”

**Minute 3:**

2. “Make sure you are engaging your muscles. The harder you work, the stronger you’ll feel!”

**Minute 4:**

2. “The more you commit to this, the more efficient your body will be!”

**Minute 5:**

2. “Remember: The more we sweat, the more we exercise, getting us closer to becoming stronger!”

**Minute 6:**

2. “Do you feel the power of your legs? You are making progress!”

**Minute 7:**
2. “Remember to always connect with your core! We’re still protecting our spine”

**Minute 8:**

3. “Your legs are going to be super strong!”
4. “The more you do, the easier it will be to walk all over campus!”

**Minute 9:**

2. “We’re almost there! Keep your core engaged. It’s the foundation of your body’s strength!!”

**Minute 10:**

2. “This is the last minute of exercise, so focus on the support and power your body is providing you!”

**Cool-down**

2. “Now that you have finished working out, you are going to do a brief cool-down jog to thank your body for what is has done.”

**Minute 1:**

2. “We are starting our cool down now. Let’s finish strong and capable!”

**Minute 2:**

2. “While we are doing this, I really want you to focus on that core. Take your time to slow your muscles down”

**Minute 3:**

2. “Soon you’ll feel how strong your body is!”

**Minute 4:**

2. “We’re almost done! This is the last minute of exercise, so you should cool down your muscles to prevent injury!”

**Minute 5:**

2. “You are all done and your body is stronger than when you started!”

**Closing:**

“Thank you for coming! Go ahead and step off the treadmill now and we will move on to the final portion of the study.”
**Neutral Script Outline**

<table>
<thead>
<tr>
<th>Greeting:</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Today we are going to work on a gradual treadmill exercise”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minute 1:</strong> “First, you are going to do a quick warm-up so off start walking”</td>
</tr>
<tr>
<td><strong>Minute 2:</strong> “You are now going to increase your pace between a 2 and 3”</td>
</tr>
<tr>
<td><strong>Minute 3:</strong> “From here you are going to start speeding up”</td>
</tr>
<tr>
<td><strong>Minute 4:</strong> “Continue at this pace”</td>
</tr>
<tr>
<td><strong>Minute 5:</strong> “You are almost finished the warm-up!”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Now it is time to start our exercise portion.”</td>
</tr>
<tr>
<td><strong>Minute 1:</strong></td>
</tr>
<tr>
<td>“1 minute in”</td>
</tr>
<tr>
<td><strong>Minute 2:</strong></td>
</tr>
<tr>
<td>“now at two minutes”</td>
</tr>
<tr>
<td><strong>Minute 3:</strong></td>
</tr>
<tr>
<td>“continue this pace”</td>
</tr>
<tr>
<td><strong>Minute 4:</strong></td>
</tr>
<tr>
<td>“you are almost half way”</td>
</tr>
<tr>
<td><strong>Minute 5:</strong></td>
</tr>
</tbody>
</table>
“now at half”

Minute 6:

“continue this pace”

Minute 7:

“You’re at seven minutes!”

Minute 8:

“Remember to keep the pace between a 4 and 5!”

Minute 9:

“Almost done!”

Minute 10:

“Final minute left!”

Cool Down

“Now you are going to cool down.”

Minute 1:

“Jog slowly and try to come down to a pace of 2 to 3”

Minute 2:

“keep going”

Minute 3:

“You’re almost done!”
<table>
<thead>
<tr>
<th>Minute 4:</th>
</tr>
</thead>
<tbody>
<tr>
<td>“You are at minute left of the cool-down”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minute 5:</th>
</tr>
</thead>
<tbody>
<tr>
<td>“You are finished”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Closing</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Thank you for coming! Go ahead and step off the treadmill now and we will move on to the final portion of the study.”</td>
</tr>
</tbody>
</table>
Appendix F: Survey Measures

Self-Objectification Beliefs and Behaviors Scale (SOBBS)
(Lindner & Tantleff-Dunn, 2017)
5-point scale from 1 (strongly disagree) to 5 (strongly agree)

Instructions: People have a variety of thoughts and feelings about their bodies. Please base your ratings on how much you agree or disagree with the following statements when thinking about your body.

1. Looking attractive to others is more important to me than being happy with who I am inside.
2. I try to imagine what my body looks like to others (i.e., like I am looking at myself from the outside).
3. How I look is more important to me than how I think or feel.
4. I choose specific clothing or accessories based on how they make my body appear to others.
5. My physical appearance is more important than my personality.
6. When I look in the mirror, I notice areas of my appearance that I think others will view critically.
7. I consider how my body will look to others in the clothing I am wearing.
8. I often think about how my body must look to others.
9. My physical appearance says more about who I am than my intellect.
10. How sexually attractive others find me says something about who I am as a person.
11. My physical appearance is more important than my physical abilities.
12. I try to anticipate others’ reactions to my physical appearance.
13. My body is what gives me value to other people.
14. I have thoughts about how my body looks to others even when I am alone.

Body Shame Phenomenology Items
(Fredrickson, Noll, Quinn, Roberts, & Twenge, 1998)
5-point scale from 1 (not at all) to 5 (extremely)

Instructions: Please indicate how much you are experiencing each of the following feelings when thinking about looking at your body in a mirror.

1. I feel like covering my body.
2. I feel angry with myself.
3. I wish I were invisible.
4. I feel like cringing.
5. I feel like an attractive person.*
6. I feel embarrassed.
7. I feel disgusted with myself.
8. I wish I could disappear.
9. I wish I were bigger.*
10. I feel like an ugly person.
11. I feel ashamed.
12. I wish I were smaller.
13. I feel awkward.
15. I feel silly.
16. I feel like a bad person.
17. I feel like crawling into a corner.
18. I feel exposed.

*Reverse coded
Higher scores reflect greater body shame.

**Flow State Scale**
(Jackson & Marsh, 1996)
5-point scale from 1 (strongly disagree) to 5 (strongly agree)

Please answer the following questions in relation to the thoughts and feelings you may have experienced during the event you just completed. There are no wrong or right answers. Think about how you felt during the event and answer the questions using the rating scale below.

1. I was challenged, but I believed my skills would allow me to meet the challenge.
2. I made the correct movements without thinking about trying to do so.
3. I knew clearly what I wanted to do.
4. It was really clear to me that I was doing well.
5. My attention was focused entirely on what I was doing.
6. I felt in total control of what I was doing.
7. I was not concerned with what others may have been thinking of me.
8. Time seemed to alter (either slowed down or speeded up).
9. I really enjoyed the experience.
10. My abilities matched the high challenge of the situation.
11. Things just seemed to be happening automatically.
12. I had a strong sense of what I wanted to do.
13. I was aware of how well I was performing.
14. It was no effort to keep my mind on what was happening.
15. I felt like I could control what I was doing.
16. I was not worried about my performance during the event.
17. The way time passed seemed to be different from normal.
18. I loved the feeling of that performance and want to capture it again.
19. I felt I was competent enough to meet the high demands of the situation.
20. I performed automatically.
21. I knew what I wanted to achieve.
22. I had a good idea while I was performing about how well I was doing.
23. I had total concentration.
24. I had a feeling of total control.
25. I was not concerned with how I was presenting myself.
26. It felt like time stopped while I was performing.
27. The experience left me feeling great.
28. The challenge and my skills were at an equally high level.
29. I did things spontaneously and automatically without having to think.
30. My goals were clearly defined.
31. I could tell by the way I was performing how well I was doing.
32. I was completely focused on the task at hand.
33. I felt in total control of my body.
34. I was not worried about what others may have been thinking of me.
35. At times, it almost seemed like things were happening in slow motion.
36. I found the experience extremely rewarding.

**Physical Activity Enjoyment Scale**  
(Kendzerski & DeCarlo, 1991)  
7-point bipolar rating scale

Please indicate how you feel at the moment about the physical activity you’ve been doing.

Item 1: "I enjoy it; I hate it"

**State Mindfulness Scale for Physical Activity**  
(Cox, Ullrich-French, & French, 2016)  
5-point scale between 0 (not at all) to 4 (very much)

We are interested in what you just experienced during the aerobic exercise session. Please indicate how much you experienced each of the following by selecting one number.

1. I was aware of different emotions that arose in me.
2. I noticed pleasant and unpleasant emotions.
3. I noticed pleasant and unpleasant thoughts.
4. I noticed emotions come and go.
5. I noticed thoughts come and go.
6. It was interesting to see the patterns of my thinking.
7. I focused on the movement of my body.
8. I felt present in my body.
9. I listened to what my body was telling me.
10. I was aware of how my body felt.
11. I noticed sensations in my body.
12. I was in tune with how hard my muscles were working.
**State Social Physique Anxiety Scale**
(Ginis, Munro, Colin, & Strong, 2010)
5-point Likert scale from 1 (not at all) to 5 (a great deal)

Indicate the extent to which you are experiencing the feelings described by each item.

1. I feel uptight about my physique/figure.
2. I am concerned that other people in the room are evaluating my weight or muscular
development negatively.
3. Unattractive features of my physique/figure make me nervous.
4. In this setting, I feel apprehensive about my physique/figure.
5. I feel comfortable with how fit my body appears to others. *
6. It makes me uncomfortable to know that other people are evaluating my physique/figure.
7. When it comes to displaying my physique/figure in this setting, I feel shy.
8. I feel relaxed when it is obvious that other people in the room are looking at my
physique/figure. *
9. Wearing these clothes, I feel nervous about the shape of my body.

*Reverse scored items

**The Situational Motivation Scale**
(Guay, Vallerand, & Blanchard, 2000)
7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly)

Read each item carefully. Using the scale below, please circle the number that best describes the
reason why you are currently engaged in this activity. Answer each item according to the
following scale.

Why are you currently engaged in this activity?

1. Because I think that this activity is interesting
2. Because I am doing it for my own good
3. Because I am supposed to do it
4. There may be good reasons to do this activity, but personally
5. Because I think that this activity is pleasant
6. Because I think that this activity is good for me
7. Because it is something that I have to do
8. I do this activity but I am not sure if it is worth it
9. Because this activity is fun
10. By personal decision
11. Because I don’t have any choice
12. I don’t know; I don’t see what this activity brings me
13. Because I feel good when doing this activity
14. Because I believe that this activity is important for me
15. Because I feel that I have to do it
16. I do this activity, but I am not sure it is a good thing to pursue it
Codification key: Intrinsic motivation: Items 1, 5, 9, 13; Identified regulation: Items 2, 6, 10, 14; External regulation: Items 3, 7, 11, 15; Amotivation: Items 4, 8, 12, 16.

**The Twenty Statements Test**  
(Kuhn & McParland, 1954)

Answer the simple question: Who am I?  
Fill in the blank with as many different answers that describe yourself. Write your answers in the order that they occur to you. Answer as if no one else will read these answers. Do not worry about the logic or importance of your answers.

I am ____________________________
I am ____________________________
I am ____________________________
I am ____________________________
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**Future Intentions to Re-engage in Exercise**  
0% to 100%

What is the likelihood that you will engage in a similar exercise session in the future?
Appendix G: Debriefing Script

Study Summary

Thank you for participating in this study. The purpose of this study was to examine how verbal cues impact how women feel about their physical appearance and the extent to which they internalize society’s ideals around how women should look. We were interested in seeing how receiving different kinds of feedback impacted your experience with exercise. Your answers to the questionnaires will be used to help us understand your responses to the in-lab physical activity task. All participants in this study are randomly assigned to receive one of three different types of cues while they exercise: either appearance-focused, function-focused, or neutral cues. The appearance condition was given cues regarding how their body looks externally. The function condition was given cues regarding how their body moved and felt. The neutral condition was given cues about time and instructions only. You were randomized to the [fill in condition here] condition. The findings from this research will help us understand how verbal commentary during physical activity can impact how women feel while moving their bodies, and it can help us to identify what type of verbal commentary is most helpful to receive.

Now that you have been made aware of the true purpose of the study, I would like to remind you you can withdraw your data from the study at this point, at no penalty. If you would like to do so, please let the student investigator know.

Please feel free to ask the student investigators any questions you may have about the study protocol, and/or use the following contact information for questions that arise later:

Principal Investigator: Eva Pila
Student Investigator: MacLean Press

If after completing this study, you require psychological support, please note the available support services in London, Ontario.

Health and Wellness at Western University
https://www.uwo.ca/health/
Monday-Friday, Daytime

- Psychological Services
  (519) 661-3031
  4th floor, Room 4100
  Student Services Building
- Student Health Services
  (519) 661-3030
  UCC Room 11 (lower level)

Reach Out 24/7
https://reachout247.ca
(519) 433-2023
24-hour phone crisis assistance

Version 05/06/2020
First Nations and Inuit Hope for Wellness Help Line
1 (855) 242-3310
24-hour culturally relevant telephone crisis intervention counselling

Canadian Mental Health Association – Mental Health and Addictions Crisis Centre
648 Huron St., in London ON
519-434-9191
# Curriculum Vitae

**Name:** MacLean Press

**Post-secondary Education and Degrees:**

The University of Western Ontario  
London, Ontario, Canada  
2016-2020 B.A. in Kinesiology

The University of Western Ontario  
London, Ontario, Canada  
2020-Present M.A. in Psychological Basis of Kinesiology

**Honours and Awards:**

Western Undergraduate Student Research Internship  
2020

FHS Kinesiology Graduate Conference Travel Award  
2021

Barbara Brown Commemorative Scholarship in the School of Kinesiology  
2021

Ontario Graduate Scholarship (OGS)  
2021

Social Science and Humanities Research Council (SSHRC)  
2021

**Related Work Experience:**

Teaching Assistant  
The University of Western Ontario  
2020-2022

Research Assistant  
The University of Western Ontario  
2019-2021

**Publications and Presentations:**


Press, M., Gilchrist, J., Sick, K., & Pila, E. Bidirectional associations between body surveillance and physical activity. Accepted to North American Society for the Psychology of Sport and Physical Activity. June 2021. (Virtual)

Press, M., Gilchrist, J., Cox, A., & Pila, E. Appearance-versus function-based verbal cues during exercise in young female non-exercisers. Accepted to Eastern Canadian Sport and Exercise Psychology Symposium. Windsor, ON. March 2021. (Virtual)