Don’t Stop the Music: Does the Thin Ideal in Pop Music Lyrics Affect Women’s Body Image During Exercise?

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ABSTRACT

Viewing music videos emphasizing the thin ideal female body has been shown to have a negative impact on body image in young women, including increased body dissatisfaction, social comparisons, self-objectifications and body size discrepancies. However, it is unclear whether the changes in body image outcomes are due to the highly objectified images of women representing the thin ideal or the lyrics of the songs. This study aimed to explore the effects of music lyrics on body image during exercise in physically active female university students. A repeated measures design was used; 29 women completed two conditions in which they were asked to walk or run for 30 minutes while listening to music. In one condition, the negative music lyric condition, songs referred explicitly to women’s appearance, objectified the female body, or referenced the thin ideal. In the neutral music lyric condition, the songs did not refer to appearance at all. Participants completed state measures of mood, body satisfaction, self-objectification and body appreciation prior to and following each of their walks/runs. Rating of perceived exertion (RPE) was assessed following each walk/run and total distance traveled was recorded. Results indicated a statistically significant time effect (all \( ps < 0.05 \)) for all outcomes except self-objectification, with women reporting feeling more confident, physically attractive, appreciative of their body, happier and feeling less fat, anxious, depressed and angry from pre- to post-exercise following both conditions. There were no effects of condition and no interaction effects. There were no differences between condition for RPE or distance travelled. This study highlights the positive effects exercise has on body image and mood outcomes and suggests that exercise may buffer the
possible negative effects of objectifying lyrics. Music that is motivational, even with appearance-focused lyrics, may not be harmful to body image in exercise settings and may be used to keep women happier and more positive about their body following exercise.

Keywords: Body image, motivational music, appearance-focus, lyrics, exercise.
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<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHAPTER 1: LITERATURE REVIEW</strong></td>
</tr>
<tr>
<td><strong>BODY IMAGE</strong></td>
</tr>
<tr>
<td><strong>BODY IMAGE AND MUSICVIDEOS.</strong></td>
</tr>
<tr>
<td><strong>BODY IMAGE AND EXERCISE</strong></td>
</tr>
<tr>
<td><strong>ACUTE EXERCISE AND STATE BODY IMAGE.</strong></td>
</tr>
<tr>
<td><strong>POSITIVE BODY IMAGE AND EXERCISE.</strong></td>
</tr>
<tr>
<td><strong>MUSIC VIDEOS AND BODY IMAGE DURING EXERCISE</strong></td>
</tr>
<tr>
<td><strong>MUSIC AND EXERCISE</strong></td>
</tr>
<tr>
<td><strong>SEDATIVE MUSIC VERSUS MOTIVATIONAL MUSIC.</strong></td>
</tr>
<tr>
<td><strong>ERGOGENIC RESPONSES TO MUSIC.</strong></td>
</tr>
<tr>
<td><strong>PSYCHOLOGICAL RESPONSES TO MUSIC DURING EXERCISE</strong></td>
</tr>
<tr>
<td><strong>PSYCHOPHYSICAL RESPONSES TO MUSIC.</strong></td>
</tr>
<tr>
<td><strong>AFFECTIVE RESPONSES TO MUSIC.</strong></td>
</tr>
<tr>
<td><strong>MUSIC LYRICS AND BODY IMAGE</strong></td>
</tr>
<tr>
<td><strong>CHAPTER 2: RATIONALE, PURPOSE AND HYPOTHESES</strong></td>
</tr>
<tr>
<td><strong>RATIONALE</strong></td>
</tr>
<tr>
<td><strong>PURPOSE</strong></td>
</tr>
<tr>
<td><strong>HYPOTHESES</strong></td>
</tr>
<tr>
<td><strong>CHAPTER 3: METHODOLOGY</strong></td>
</tr>
<tr>
<td><strong>DESIGN</strong></td>
</tr>
<tr>
<td><strong>PARTICIPANTS</strong></td>
</tr>
<tr>
<td><strong>MEASURES</strong></td>
</tr>
<tr>
<td><strong>PROCEDURES</strong></td>
</tr>
<tr>
<td><strong>DATA SCREENING AND ANALYSIS</strong></td>
</tr>
<tr>
<td><strong>CHAPTER 4: RESULTS</strong></td>
</tr>
<tr>
<td><strong>DATA SCREENING</strong></td>
</tr>
<tr>
<td><strong>DESCRIPTIVE STATISTICS</strong></td>
</tr>
<tr>
<td><strong>CORRELATIONS</strong></td>
</tr>
<tr>
<td><strong>MANIPULATION CHECKS</strong></td>
</tr>
<tr>
<td><strong>HYPOTHESIS TESTING</strong></td>
</tr>
<tr>
<td><strong>CHAPTER 5: DISCUSSION</strong></td>
</tr>
<tr>
<td><strong>BODY IMAGE AND MOOD OUTCOMES</strong></td>
</tr>
<tr>
<td><strong>RPE AND DISTANCE TRAVELLED</strong></td>
</tr>
<tr>
<td><strong>EXTENSION TO CURRENT LITERATURE</strong></td>
</tr>
<tr>
<td><strong>LIMITATIONS</strong></td>
</tr>
<tr>
<td><strong>FUTURE DIRECTIONS</strong></td>
</tr>
<tr>
<td><strong>IMPLICATIONS</strong></td>
</tr>
<tr>
<td><strong>CONCLUSION</strong></td>
</tr>
<tr>
<td><strong>REFERENCES</strong></td>
</tr>
<tr>
<td><strong>APENDIXES</strong></td>
</tr>
</tbody>
</table>
LIST OF TABLES

TABLE 1: SAMPLE CHARACTERISTICS .............................................................. 25
TABLE 2: MEANS AND STANDARD DEVIATIONS (SD) FOR ALL MEASURES BY CONDITION ................................................................. 34
TABLE 3: PEARSON BIVARIATE CORRELATIONS BETWEEN STUDY VARIABLES BY CONDITION ................................................................. 37

LIST OF FIGURES

FIGURE 1: CONCEPTUAL FRAMEWORK OUTLINING BENEFITS OF MUSIC IN SPORT AND EXERCISE, ADAPTED FROM TERRY AND KARAGEORGHIS (2006) ........................................... 13
CHAPTER 1: LITERATURE REVIEW

Body Image

The definition of body image has evolved over many years and is currently conceptualized as a multidimensional construct (Grogan, 2017), including how people perceive, think about, feel about or act towards the body (Cash & Smolak, 2011; Grogan, 2017). Much of the body image research has examined concerns about appearance, particularly body shape and weight, and has tended to focus on young women (Grogan, 2017). However, significant evidence exists that body image concerns affect both men and women across the lifespan (Grogan, 2017). Most research has examined body image as a negative construct, often focusing on body dissatisfaction which is defined as “a person’s negative thoughts and feelings about his or her body” (Grogan, 2017, p. 4). This dissatisfaction is thought to result from discrepancies between the ideal and perceptions of one’s body (Grogan, 2017). For women in Western countries, the ideal female body is thin with large breasts, a small waist, thin legs with a thigh gap, tall, but not too tall, and, recently, some muscle tone while still remaining feminine (Grogan, 2017).

Body dissatisfaction has been reported to affect approximately 13.4-31% of women (Fallon, Harris, & Johnson, 2014). Body dissatisfaction is associated with negative health outcomes such as increased anxiety, low self-esteem, depression, and unhealthy eating behaviors (Cash & Henry, 1995). High levels of body dissatisfaction have also been linked to eating disorders such as anorexia or bulimia, which have negative effects on both psychological and physical health (Stice & Shaw, 2002).

Numerous sociocultural factors have been identified as having an impact on body image such as family, friends and the media (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).
The media (including television, movies, music, magazines, and social media) can influence men’s and women’s body image by depicting the ideal body as the norm and highly desirable (Grogan, 2017). This frequent exposure to the ideal can lead to social comparisons and unrealistic expectations about the possibility of achieving the ideal and the outcomes of achieving the ideal (Grogan, 2017). Generally, media influences have been shown to produce negative effects on body image in women (Grabe, Ward, & Shibley Hyde, 2008; Groesz, Levine, & Murnen, 2002). For example, in two meta-analyses, viewing images of the thin ideal (compared to viewing average or plus sized women or inanimate objects) was associated with greater body dissatisfaction, more internalization of the ideal, and disordered eating behaviours and beliefs (Grabe et al., 2008; Groesz et al., 2002). Effect sizes were generally small to moderate. Further, in their review of the impact of media on body image, Levine and Murnen (2009) noted that different types of media, including television and magazines, both impacted body image negatively. One other type of media that has received some attention in the literature is music videos.

**Body Image and Music Videos.** Current music often draws attention to the societal body ideals, both through the lyrics of the music (Flynn, Craig, Anderson, & Holody, 2016) and the images portrayed through music videos (Prichard & Tiggemann, 2012). Although no research has directly examined the effects of music on body image, a growing body of research has shown that music videos contribute to negative body image concerns among young women, eliciting increases in body dissatisfaction, lower body and self-esteem and increases in body-related anxiety (Mischener, Schie, Wigboldus, Baaren, & Engels, 2013; Prichard & Tiggemann, 2012; Tiggemann & Slater, 2004).

Several studies have shown that music videos which portray the ideal female body or
objectify the female body have a negative impact on body image (Mischner et al., 2013; Prichard & Tiggemann, 2012). For example, Mischener et al. (2013) asked 56 women from a college campus to watch a series of music videos. In the experimental condition, participants watched three videos showing sexually objectifying images, where women in the music videos were thin and wearing little clothing. The videos highlighted the women’s bodies in an objectifying manner as they danced in the video, with images of the female dancers focused primarily on their bodies with little attention to their faces. In the neutral condition, participants watched three music videos by the same artists showing images that did not emphasize the body and where the women in the video were not sexually objectified. After viewing the videos, women who had low self-esteem experienced negative body image outcomes compared to women who had high self-esteem (Mischener et al., 2013). For example, women who reported having lower self-esteem reported their perceived body size to be larger than it was following viewing the objectifying music videos. Results also indicated a smaller ideal body size in the objectifying condition, specifically for women who had a lower BMI, where pre-measures indicated a thinner ideal body type (Mischener et al., 2013). These results provide evidence that the idealized body type is flexible and is very easily altered by media exposure for young women (Mischener et al., 2013).

A similar study conducted by Tiggemann and Slater (2004) looked at the effects of thin-idealized women in music videos on body image outcomes in women. In this study, 84 female university students were randomly assigned to either an appearance-focused condition, in which they watched music videos that showed ideal women who were thin and attractive consistent with the societal ideal, or to a non-appearance-focused condition, in which they watched videos with ‘ordinary’ looking people or scenery, in groups of 3 to 4 people. State mood and body
dissatisfaction measures were completed after viewing the videos. Results indicated that following viewing the appearance-focused videos, there was an increase in body dissatisfaction and frequency of social comparisons, however there were no significant effects for mood (Tiggemann & Slater, 2004).

A study conducted by Bell, Lawton, and Dittmar (2007) aimed to look at the effects of thin models in music videos on body dissatisfaction in female adolescents. Participants were 87 females aged 16-19 years. Participants completed one of the three experimental conditions: music videos in which women were sexually objectified (i.e., women were thin, wearing revealing clothes, and the video images were focused primarily on the appearance of the women), music only without the video component (using the same songs as the video condition), or the control condition in which participants were asked to memorize a list of words that were provided to them, with no music or videos present. Mood, self-esteem, and body dissatisfaction were measured both before and after viewing the music videos. Results indicated that the adolescent girls who watched the music videos with the appearance-focused images had a larger increase in body dissatisfaction compared to the girls who only listened to the music. With regards to mood, results indicated that participants reported lower positive affect after exposure to both the music conditions (i.e., regardless of the visual component).

**Body Image and Exercise**

Given the pervasiveness of negative body image and its negative consequences, significant effort has attempted to investigate ways of improving body image. In general, exercise has a positive impact on body image, leading to reductions in negative body image (Campbell & Hausenblas, 2009; Hausenblas & Fallon, 2006; Reel et al., 2007). In 2006, Hausenblas and Fallon conducted a meta-analysis looking at 121 studies which indicated
exercisers had a more positive body image than non-exercisers, and participants who completed an exercise intervention program experienced improved body image compared to those who participated in a control condition involving no exercise (Hausenblas & Fallon, 2006). More recently, in 2007 and 2009, two meta-analyses were conducted examining the effects of exercise on body image. Reel and colleagues (2007) examined 35 studies that looked at a variety of exercise programs and their effects on body image concerns. In the most recent meta-analysis conducted by Campbell and Hausenblas (2009), 57 exercise intervention studies were examined to explore the effects of exercise interventions on body image. In general, there were small positive effects of exercise on body image (Campbell & Hausenblas, 2009; Reel et al., 2007).

These meta-analyses also explored potential moderators of the relationship between body image and exercise, including participant factors (e.g., sex, age) and exercise factors (e.g., exercise modality; Campbell & Hausenblas, 2009; Hausenblas & Fallon, 2006; Reel et al., 2007). In general, there were no significant sex differences, although Campbell and Hausenblas (2009) and Hausenblas and Fallon (2006) found the effect sizes were larger for women compared to men. With respect to age, the majority of the studies looked at younger samples (i.e., adolescents and young adults), likely because these groups are most likely to experience body image concerns (Campbell & Hausenblas, 2009; Hausenblas & Fallon, 2006; Reel et al., 2007). Both Reel and colleagues (2007) and Hausenblas and Fallon (2006) generally found larger effect sizes for younger samples. By contrast, Campbell and Hausenblas (2009) found larger effect sizes for older adults compared to the younger participants. These authors argued that this age difference may be because adults were more willing to express issues with body image concerns compared to the adolescent participants.
In terms of exercise-related factors, mixed findings of the effect of exercise type have been reported. Reel and colleagues (2007) found that anaerobic exercise (e.g., weight training) had a stronger effect on body image concerns compared to aerobic exercise (e.g., running and jogging; Reel et al., 2007). However, Hausenblas and Fallon (2006) found a larger effect size for programs that included both aerobic and anaerobic exercises compared to either modality alone. Campbell and Hausenblas (2009) found no differences based on type of exercise. While factors such as exercise duration and length of intervention did not moderate the effectiveness of exercise on body image, larger effects were found for more frequent exercise sessions (Campbell & Hausenblas, 2009). Finally, Hausenblas and Fallon (2006) found that high or moderate intensity exercise had the greatest effects on positive body image compared to lower intensities. Campbell and Hausenblas (2009) compared moderate to strenuous exercise and found no difference between the two.

In the exercise and body image literature, two limitations have been acknowledged. First, research looking at the effects of exercise on body image has generally examined chronic effects of exercise on trait body image. Hausenblas and Fallon (2006) noted that although they intended to examine the effects of acute exercise, they could find only one study (at the time) looking at its effects on state body image. Secondly, the vast majority of studies examining the impact of exercise on body image has focused on negative indicators of body image (e.g., dissatisfaction, anxiety). However, this research has neglected to examine positive body image which is a distinct construct (Tylka & Wood Barcalow, 2015).

**Acute Exercise and State Body Image.** Since Hausenblas and Fallon’s (2006) meta-analysis, a small but growing body of literature has examined whether a single session of exercise can lead to improvements in state body image. Vocks, Hechler, Rohrig, and Legenbauer
(2009) conducted an experimental study, where 120 female participants were assigned to either the experimental exercise group, in which they completed one hour of cycling on a stationary bike, or the control group where participants read a newspaper. Participants in the experimental group reported a decrease in state body dissatisfaction following exercise. In the control group, the opposite effects were seen, with an increase in body dissatisfaction following their condition. This study supports the idea that a single session of exercise can have improvements in body image outcomes in women.

Lamarche, Gammage, and Strong (2009) examined the relationship between state social anxiety and self-presentational efficacy and the use of mirrors during a step aerobics class with 51 female university students. Participants completed the step aerobics class either in front of mirrors or in the control condition where mirrors were not present. Results indicated following a 20-minute exercise class, there were decreases in state social anxiety after exercise, with or without the presence of mirrors.

Lepage and Crowther (2010) examined the effects of exercise on state body dissatisfaction and negative affect in 61 female university students who were classified as having either high trait body dissatisfaction or low trait body dissatisfaction. Participants completed body image and affect measures before and following self-regulated exercise. Results indicated decreases in state body dissatisfaction and negative affect following exercise and increases in positive affect following exercise were experienced by all women.

Moreover, Salci and Martin Ginis (2017) examined if an acute session of exercise could affect state body image. Participants included 60 female university students who reported previous body image disturbances. They completed either an exercise session on a stationary cycle ergometer at a moderate-to-vigorous intensity or a control condition where participants
engaged in silent reading. Results showed increases in state body satisfaction from pre-exercise to post-exercise for the exercise group compared to the control group. Together, these studies provide evidence that a single session of exercise can have positive improvements in state body image in women. However, most of these studies have operationalized body image as body dissatisfaction or anxiety; whether these effects are seen with indicators of positive body image are unknown.

**Positive Body Image and Exercise.** Recent work shows that positive body image is not merely the absence of negative body image (Tylka & Wood Barcalow, 2015b). Positive body image itself is a multifaceted construct characterized by three main components: body appreciation, a positive processing mechanism, and an emphasis on the functionality of the body versus appearance (Halliwell, 2015; Tylka & Wood-Barcalow, 2015b). Having an appreciation for the body includes having an overall love and acceptance for the body as it is (Halliwell, 2015; Tylka & Wood-Barcalow, 2015b). A positive mechanism to accept and process messages about the body involves accepting positive information in a protective manner and rejecting negative information (e.g., unrealistic expectations of the thin ideal in media; Halliwell, 2015; Tylka & Wood-Barcalow, 2015b). Focusing on the functionality of the body includes emphasizing what the body can do rather than what it looks like and being mindful and having an understanding of the body’s needs, which includes maintenance of overall health and well-being (Halliwell, 2015; Tylka & Wood-Barcalow, 2015b).

Limited research, using qualitative, correlational, and experimental designs, has provided evidence that exercise participation is associated with more positive body image. For example, Holmqvist and Frisen (2012) found that adolescent boys and girls with positive body image reported using exercise to promote their positive body image. Further, women participating in
embracing activities such as yoga and belly-dancing report higher body appreciation than non-participants (Mahlo & Tiggemann, 2016; Tiggemann, Coutts, & Clark, 2014). Similar results were found in a correlational study by Andrew, Tiggemann, and Clarke (2016), where 266 female undergraduate university students who were active in various sports and exercise reported decreased self-objectification, which was found to mediate increases in body appreciation. Homan and Tylka (2014) examined the relationship between exercise and body appreciation, internal body orientation, and functional body satisfaction (all indicators of positive body image) in 321 college women. Participants who exercised more frequently reported higher positive body image on all three measures. However, this relationship was weaker for women who exercised for appearance-based (versus functional) motives (Homan & Tylka, 2014).

Moreover, research has shown that not only can exercise lead to decreases in negative body image, it can also lead to improvements in positive body image. For example, Gammage, Drouin, and Lamarche (2016) found that after both yoga and resistance classes, social physique anxiety decreased, while body satisfaction increased after completing one session of exercise. This study indicates that a single session of exercise can both reduce negative body image and increase positive body image, although the type of exercise may moderate these effects.

**Music Videos and Body Image during Exercise**

Given that exercise appears to have positive effects on body image, a study conducted by Prichard and Tiggemann (2012) examined whether exercise could buffer the effects of viewing objectifying music videos on body image in a sample of 184 female university students. Participants were randomly assigned to either an exercise or no exercise condition upon arrival to the session. In the exercise condition, participants were asked to complete a treadmill exercise task where they were instructed to self-select a comfortable pace for fifteen minutes. Participants
who were assigned to the no-exercise condition completed the fifteen-minute session standing on the treadmill, but not moving. In addition, within each of the two exercise conditions, half of the participants viewed a series of appearance-based music videos and the other half viewed a series of neutral music videos while completing their task. The appearance-focused music conditioned contained five videos showing women who were thin and attractive and emphasized the female body; in addition, there was one slower tempo song that did not show any women as a distractor from the true purpose of the study. The neutral videos showed men and women of varying body sizes, as well as the same slow tempo song (Prichard & Tiggemann, 2012).

Results indicated women in the non-exercise condition felt less attractive, less satisfied with their bodies, and fatter than the women in the exercise condition (Prichard & Tiggemann, 2012). In addition, women in the exercise condition reported feeling more confident, happier, and less depressed and anxious and were lower in state self-objectification compared to the women who did not exercise. Further, those who viewed the appearance videos reported higher state self-objectification than those who watched the neutral videos. An interaction also emerged such that women in the exercise group who watched appearance videos reported feeling more attractive than women who watched appearance videos but did not exercise, but they reported no difference in feelings of attractiveness compared to those who watched the neutral videos (Prichard & Tiggemann, 2012). The findings of this study provide evidence that music videos that feature appearance-based images lead to increased self-objectification and negative body image outcomes, and that exercise can potentially buffer the negative effects. Further, although there were overall negative changes in body image characteristics associated with the appearance-focused videos, it is unclear whether these changes were due to the images in the music videos, the music and lyrics, or a combination of the two (Prichard & Tiggemann, 2012).
Music and Exercise

Music encompasses multiple components that make up an arrangement or a song, composed of a melody, harmony, rhythm, syncopation, tempo and lyrics (Karageorghis, 2017). The melody is the most distinguishable component and plays a role in the familiarization of a song, as it is the part that is the most notable. The harmony is the combination of the musical notes and the melody, and makes up the overall sound of the music. The rhythm is composed of the distribution of the notes within a song, whereas the syncopation is the stress placed on the beat of the song, giving the song that “move to the beat feeling” (Karageorghis, 2017, p. 6). Tempo refers to how fast or slow the music is and is typically expressed in beats per minute (bpm; Karageorghis, 2017). The lyrics are the words that are paired with the music and the lyrics convey messages to the audience; sometimes the lyrics can be clear and explicit in their messages and other times the lyrics can convey messages that are implied rather than specifically stated (Karageorghis, 2017).

Music is often used in the process of self-regulation, specifically to regulate mood and emotion and increase positive affect (Karageorghis, 2017). Music can also affect other psychological outcomes such as enjoyment, imagery, self-talk, and arousal control (Karageorghis, 2017). Karageorghis and colleagues (1999) proposed that music was also influential during physical activity, having multiple positive benefits including, but not limited to, emotion regulation, increased positive affect, reduced rate of perceived exertion (RPE) and enhanced performance within sport and exercise settings (Karageorghis, Terry, & Lane 1999). Since that time researchers have investigated characteristics of the music and exercise on numerous outcomes.
**Sedative Music versus Motivational Music.** Early research focused on the effects of two different types of music in physical activity settings: sedative and motivational. Sedative music is soft and has a slow rhythm and, in physical activity settings, is generally most often used during pre-task situations (Karageorghis & Priest, 2012). However, generally, sedative music has shown limited positive outcomes on performance in physical activity settings. For example, Karagoerghis, Drew, and Terry (1996) found that sedative music led to lower hand grip scores compared to white noise.

Motivational music, by contrast, is characterized by an upbeat tempo (greater than 120 bpm) and a strong rhythm and is thought to be more beneficial within the exercise domain compared to sedative music (Karageorghis & Priest, 2012). Further, research has shown that moderate and high tempo music is preferred by athletes and exercisers compared to sedative music or underterous (neither motivating or unmotivating) music during physical activity (Karageorghis & Priest, 2012).

Given that motivational (versus sedative) is preferred in physical activity settings (Karageorghis & Priest, 2012), the majority of research has focused on the use of motivational music, and particularly asynchronous motivational music, during physical activity. Asynchronous music is music in which an individual does not make any attempt to try match his/her movements with the rhythm of the song; for example, music played in the background at a gym is considered asynchronous (Karageorghis & Priest, 2012). By contrast, if movements are matched to the rhythm of the music (e.g., during an aerobics class), it is considered synchronous. In attempting to understand and describe the effects of asynchronous, motivational music during sport and exercise, Terry and Karageorghis (2006) proposed a conceptual model (see Figure 1).
According to this model, music in physical activity settings can lead to both ergogenic (performance-related), psychological (affective, cognitive and behavioural) and psychophysical (perceptions of effort and fatigue) effects (Terry & Karageorghis, 2006). For example, music during exercise has been shown to lead to delayed fatigue and increased work capacity (i.e., power, endurance, strength, productivity), greater focus on external rather than internal cues during exercise, increased positive affect and decreased negative affect, decreased perceptions of exertion, and greater intention and adherence to exercise (see Karageorghis & Priest, 2012 for review).

According to this model, these benefits occur through intermediaries, which are the factors that are thought to contribute to the motivational qualities of music: rhythm response, musicality, cultural impact, and associations (Terry & Karageorghis, 2006). These factors are categorized as either intrinsic or extrinsic qualities. The intrinsic qualities are related to characteristics of the music itself and include the rhythm response and musicality. Rhythm response is described as
the effects due primarily to the tempo of the music; body movement occurs due to the speed (in bpm) of the music in the exercise domain (Karageorghis et al., 1999). Musicality is primarily influenced by the pitch-related elements (i.e., harmony, melody; Karageorghis et al., 1999).

The extrinsic qualities are related to the individual and can be defined as the connection the listener makes to the music, such as the cultural impact and personal associations (Karageorghis et al., 1999). The cultural impact refers to how pervasive the music is in society; for example, the chart success of the song. Personal associations are the links (e.g., emotions) made by the individual outside the music itself, such as feeling pumped up when hearing ‘Eye of the Tiger’ from Rocky or thinking about Halloween when hearing ‘Thriller’. Within the model, these intermediaries are arranged in a hierarchal fashion, where rhythm and musicality are more influential compared to cultural impact and personal association (Karageorghis et al., 1999).

Finally, the model suggests both personal (e.g., familiarity, age and gender) and situational factors (e.g., when and where the music is played, sound intensity and whether it is independent use versus group use) can impact these intermediaries to produce the benefits of motivational music. Thus, there is no one formula for creating motivational music; rather, the effects depend on a complex interaction between the individual, the environment, the exercise, and the music itself (Terry & Karageorghis, 2006).

Some researchers have suggested that rhythm response and musicality are the most powerful on exercise-related outcomes (Chtourou, 2013; Karageorghis, 2017). However, there have been mixed findings in the music literature around which components are the most influential. Laukka and Quick (2011) examined which components of music athletes thought contributed to their positive emotional responses to music during athletic performance. Aspects of the music itself (e.g., the beat) were cited by 61% of the sample; however, memories (8%),
lyrics (7%) and personal factors (6%) were also reported. Sanchez, Moss, Twist, and Karageorghis (2014) examined the effects of the presence or absence of lyrics on cycling cadence and found that the music condition with lyrics resulted in a greater cycling cadence compared to the music condition with no lyrics, but only at minute 6 of the cycling task (Sanchez et al., 2014), suggesting that the meaning behind the lyrics, and not just the notes or the beat, were influential.

**Ergogenic Responses to Music.** Several studies have shown ergogenic benefits to music during exercise, as music can have significant physiological effects on the listener leading to enhanced performance (Sanchez et al., 2014). These physiological effects include increased pulse rate, skin reactance and pupil dilation (Hartman & Conklin, 2009), decreased muscle tension (Zareian, Baranie, & Pooraghaei, 2015), longer time to fatigue (Copeland & Franks, 1991), faster lactate clearance and recovery times (Eliakim, Bodner, Eliakim, Nemen, & Meckel, 2012; Karageorghis & Priest, 2012), greater neuromuscular efficiency (Karageorghis & Priest, 2012; Zareian et al., 2015), and increased endurance, power, and strength (Karageorghis et al., 1996; Karageorghis & Lee, 2001), all of which can lead to greater work capacity. In turn, it is thought higher work capacity contributes to improved performance outcomes. For example, exercise with motivational music has been shown to result in higher cycling cadence (Sanchez et al., 2014), peak power (Jarraya et al., 2012) and force production during a squat jump (but not bench press) compared to a no music condition (Biagini et al., 2012). However, performance benefits with music have not always been shown. For example, during a running sprint task no significant effects were seen between three music conditions (slow music, fast music and no music) and during a supramaximal cycling task between two music conditions (slow music
compared to fast music) for heart rate, blood lactate or power output (Atan, 2013; Yamamoto et al., 2003).

In summarizing the literature examining the effects of music on performance during physical activity, Chtourou (2013) conducted a meta-analysis of 11 studies. In 7 of the 11 studies there were positive effects on performance outcomes (for example, peak power, mean power, changes in time during performance, anaerobic endurance and fatigue) with the use of music.

**Psychological Responses to Music During Exercise.** In addition to the ergogenic effects, numerous psychological effects of music during exercise have been noted, including effects on affect, cognitions and behaviours. In addition, benefits in one subtype of psychological responses, psychophysical responses, have also been shown (Karageorghis, 2017).

**Psychophysical responses to music.** In general, studies have shown that there is a decrease in RPE (how hard an individual feels he/she is working) when exercising with music compared to exercising without music (Sanchez et al., 2014). For example, Sanchez et al. (2014) examined psychophysical effects of music during a cycling task in male and female university students cycling with music with lyrics, music without lyrics and no music. While both cycling cadence (as a performance indicator) and heart rate were higher at the end of the trials in the music with lyrics condition compared to the other two conditions, RPE increased across trials under all conditions. Sanchez and colleagues (2014) suggested that researchers needed to further investigate the effects of lyrics on a variety of outcomes in physical activity settings.

This finding has been replicated (Eliakim et al., 2012; Nethery, 2002; RamezanPour et al., 2012). For example, Eliakim and colleagues (2012) had 20 male participants complete a 6-minute run on a track at peak oxygen consumption under two conditions: music or no music. Results indicated reduced RPE following the 6-minute track run in the music condition.
compared to no music (Eliakim et al., 2012). However, the type of music may be important to consider. RamezanPour and colleagues (2012) examined the effects of four types of music on RPE during a cycling task in females: upbeat music, relaxing music, no music, or arbitrary music (RamezanPour et al., 2012). Results indicated reduced RPE, but increased heart rate, following the upbeat music condition compared to the relaxing music and no music conditions (RamezanPour et al., 2012). Thus, participants felt they were working less hard in the upbeat music condition, despite actually working harder.

Affective Responses to Music. Numerous affective responses to music during exercise have been reported, including increases in positive affect, decreases in negative affect, and increases in enjoyment (Karageorghis & Priest, 2012; Laukka & Quick, 2011). Laukka and Quick (2011) conducted a study examining the reasons for using music in sport and exercise settings among 252 athletes. The most frequently reported reasons were to pump up the athlete and to increase positive affect. Further, the athletes indicated that music helped regulate their mood and emotions for hours after exercise. They also indicated that they most frequently felt happy, alert and confident during sport and exercise with the use of music (Laukka & Quick, 2011).

Tate, Gennings, Hoffman, Strittmatter, and Retchin (2012) examined the performance effects and the effects on enjoyment of the inclusion of music in multiple swimming trials. Participants included 24 competitive swimmers who completed a total of five swimming trials, four of which were 50-meters in length and one which was 800-meters in length. In one condition, they listened to self-selected music and in the other there was no music. Performance times were significantly faster in both the 50-meter and 800-meter trials in the music group
compared to the no-music group. No statistically significant differences were found for enjoyment (Tate et al., 2012).

Experimental studies have also shown music during exercise to be associated with affective benefits at all exercise intensities (Hutchinson, Karageorghis, & Jones, 2015). Hutchinson and colleagues (2015) examined the effects of music with a video component during a treadmill running task at both high and low intensities. Results indicated that the condition with music and video resulted in the greatest effects on positive affect, at all exercise intensities. Moreover, changes in mood from pre-exercise to post-exercise have been shown. Following exercise with the use of music, feelings of happiness increased from pre-to post exercise (Carels, Coit, Young, & Berger, 2007). Biagini and colleagues (2012) examined the effects of music on performance and mood during completion of squat jumps and bench presses in 20 male athletes; no statistically significant changes were seen for depression, confusion or anger (Biagini et al., 2012). Moreover, Sanchez and colleagues (2014) found that affective outcomes also improved with use of music (with or without lyrics) compared to a no-music condition during a cycling task. Specifically, greater increases in positive and greater decreases in negative affect were seen in both music conditions compared to no music (Sanchez et al., 2014).

Music Lyrics and Body Image

To date, very few studies have looked at the effects of music on body image; rather, the impact of viewing music videos, which include both the music itself as well as visual images, has been investigated. Overall, viewing appearance-based music videos has been shown to have negative effects on body image outcomes in women, including higher levels of body dissatisfaction, higher levels of social physique anxiety and negative affect as well as lower levels of body appreciation, lower positive affect and lower body esteem (Bell et al., 2007;
Mischener et al., 2013; Prichard & Tiggeman, 2012; Tiggemann & Slater, 2004). However, it is likely that content of the lyrics may impact body image. Researchers have noted a change in the content of lyrics within popular music over time, moving from lyrics expressing feelings of love and affection to more sexual messages and imagery (Dukes, Bisel, Borega, Lobato & Owens, 2003). For example, Flynn and colleagues (2016) examined objectification within lyrics in different genres of music over the time period 2009-2013. They found that in pop music, 47% of the songs had lyrics that objectified the body, 35% of the songs had lyrics that described male or female gaze, and 30% of the songs had lyrics that addressed beauty or attractiveness (Flynn et al., 2016). Across all genres of music, it was found that of the songs that included objectifying lyrics, 91.8% of songs had lyrics that were identified as objectification of women compared to men. Further 86.5 percent of songs that had lyrics that were identified as relating to attractiveness described women (Flynn et al., 2016). Given these objectifying messages it is possible that the lyrics of these songs may impact body image themselves.
CHAPTER 2: RATIONALE, PURPOSE AND HYPOTHESES

Rationale

Music is frequently used during exercise. Exercise facilities frequently play music to provide people using the gym positive experiences during their exercise sessions, and individuals often use personal music devices during their exercise sessions. Listening to music during exercise has been shown to have positive effects on performance (e.g., increased force production, greater work output, improved skill acquisition), ergogenic responses (e.g., decreased rate of perceived exertion, greater neuromuscular efficiency), and psychological outcomes (e.g., improvements in mood and affect, greater enjoyment, arousal control; Terry & Karageorghis, 2006). Based on these positive outcomes during exercise, Terry and Karageorghis (2006) proposed a conceptual model to describe how many of these outcomes occur. They proposed that two antecedents (personal and situational factors) work through four intermediaries (i.e., rhythm response, musicality, cultural impact and personal associations) to influence those psychological, psychophysical, and ergogenic outcomes. Ultimately, Terry and Karageorghis (2006) suggested that these positive outcomes that result from listening to music during exercise can positively impact exercise adherence.

One psychological outcome of music during exercise that has not received a lot of attention is body image. Body-related concerns are very prevalent in young adult women. Approximately 13% -31% of women report being dissatisfied with their bodies (Fallon et al., 2014). Negative body image evaluations, including body dissatisfaction, are associated with negative health outcomes such as depression, unhealthy eating behaviors, increased anxiety and overall low self-esteem (see Grogan, 2017 for review). A large body of research has
demonstrated that chronic exercise programs have small but positive effects on trait body image (Campbell & Hausenblash, 2009; Hausenblas & Fallon, 2006; Reel et al., 2007). Relatively few studies, by contrast, have examined the connection between a single bout of exercise and the effects on state body image. In some studies, following a single session of exercise, positive body image outcomes have been shown, including increased body satisfaction (Salci & Martin Ginis, 2017) and reduced social physique anxiety (Gammage et al., 2016), and decreases in body dissatisfaction as well as decreases in negative affect (Lepage & Crowther, 2010). These studies provide evidence that a single session of exercise can have beneficial outcomes on various aspects of body image, although the current body of literature is limited (Gammage et al., 2016; Lepage & Crowther, 2010; Salci & Martin Ginis, 2017).

To date, there are very few studies that have examined the influence of music on body image; however, several studies have looked at the effect of music videos on body image. In general, these studies have shown a negative impact of viewing music videos on body image outcomes, including increased body dissatisfaction, social physique anxiety and negative affect, and decreases in positive body image outcomes such as body satisfaction, positive affect, self-esteem and body esteem (Bell et al., 2007; Grabe et al., 2008; Groesz et al., 2002; Mischener et al., 2013; Prichard & Tiggeman, 2012; Tiggemann & Slater, 2004). One study has investigated the effects of viewing music videos on body image during exercise, with women viewing appearance-focused music videos or music videos with neutral images while completing a treadmill exercise task or silent rest period (Prichard & Tiggeman, 2012). Viewing the appearance-focused music videos resulted in more negative body image compared to the neutral condition; however, exercise was able to reduce some of the negative body image effects. These results suggest that exercise may combat the negative body image outcomes associated with
exposure to the thin ideal representation of the female body in music videos (Prichard & Tiggemann, 2012).

Although these studies suggest that music videos can negatively impact body image, it is unclear if the negative impact on body image was due to the images depicted in the videos or the music and lyrics, or a combination of the two. No research has investigated the impact of music lyrics during exercise on body image outcomes, but recent research has suggested that lyrics in current music often contain lyrics that describe idealized images of the female body, sexualized images, or objectify the female body (Flynn et al., 2016). Further research is needed to determine if music that has negative body image lyrics negatively impacts body image during exercise.

The present study addressed several of the limitations in the current literature, by examining the effects of music with negative body image lyrics on state measures of both positive and negative body image following a single session of exercise in young university women. Given that music is commonly used in gyms, it is important to know whether negative body image outcomes occur, thus undermining the potentially positive effects of exercise on body image. Ultimately, this study provided information on how to ensure the exercise environment creates positive psychological outcomes, which may ultimately impact adherence rates.

**Purpose**

The purpose of this study was to examine the influence of music on body image in women during exercise. Specifically, this study examined the following research question: does pop music with negative body image lyrics (compared to neutral lyrics) elicit negative effects on body image outcomes during exercise in female university exercisers.
Hypotheses

1. It was hypothesized that music that has negative body image messages will lead to higher scores on measures of state body dissatisfaction, feeling fat, anxious, depressed, and state self-objectification during exercise, compared to music with neutral body image lyrics.

2. It was hypothesized that music that has negative body image messages will lead to lower scores on measures of state body appreciation, happiness, confident, physical attractiveness, and feeling satisfied with one’s shape and size during exercise compared to music with neutral body image lyrics.

3. It was hypothesized that music that has negative body image messages will lead to lower RPE and farther distance travelled compared to music with negative body image messages.
CHAPTER 3: METHODOLOGY

Design

This study utilized a repeated measures experimental design. Each participant completed an exercise session under two conditions (a negative music condition and a neutral music condition) with quantitative measures collected through questionnaires pre- and post-run in both conditions. Conditions were counterbalanced to control for order effects.

Participants

A total of 30 women were recruited for the study; one participant completed only the first session. Thus, the final sample for this study included 29 female university students from 17-29 years of age. A sample size analysis was conducted using G-Power (Faul et al., 2006) to estimate the sample size for the study. Hutchinson and Karageorghis (2013) found that the use of motivational music during a treadmill running task versus a no music control group yielded a moderate effect size for affective measures (positive affect) and situational motivation. Based on a medium effect size, with $\alpha = 0.05$ and power set to 0.80, the minimum required sample size was determined to be 27 participants.

The inclusion criteria for this study included university women who were regular exercisers, meaning they exercised at least 3 times per week. Because body image is more positive in exercisers than non-exercisers (Hausenblas & Fallon, 2006) this criteria reduced heterogeneity in the sample. Further, given that non-exercisers may experience a positive effect from the single bout of exercise itself (McInman & Berger, 1993), this sample ensured that differences were due to the music, rather than just the exercise. Further, participants were required to have normal or corrected hearing, and understand English fluently. The participants
were recruited through the university by means of posters and through announcements made during lectures on the University Campus.

The mean age of the sample was 22 years ($SD = 2.62$) and the majority of the women were in their second or third year of study at Brock University. They came from a variety of programs at the university (24% from Kinesiology, 13% from Applied Health Sciences, 13% from Child and Youth Studies, 10% from Psychology, and remainder from various programs such as Visual Arts and Medical Sciences). Based on self-reported weekly frequency of exercise and IPAQ scores, the sample was very active. BMI for the sample placed them in the normal weight classification. See Table 1 for participant characteristics.

Table 1

<table>
<thead>
<tr>
<th>Sample Characteristics ($n = 29$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>Year in School</td>
</tr>
<tr>
<td>Physical activity (times per week)</td>
</tr>
<tr>
<td>IPAQ (MET minutes per week)</td>
</tr>
<tr>
<td>BMI</td>
</tr>
</tbody>
</table>

*Note.* IPAQ = International Physical Activity Questionnaire, BMI = Body Mass Index.

Measures

*Baseline Measures.* The baseline questionnaire package was used to screen for readiness to be active and basic descriptive information (see Appendix A).

*Physical Activity Readiness Questionnaire+ (PAR-Q+).* This screening questionnaire was used to ensure participants were able to safely participate in physical activity. Participants answered yes or no to 7-items (Canadian Society for Exercise Physiology [CSEP], 2012). If participants answered yes to any of the items, physical activity could not be started before seeking medical advice (CSEP, 2012).
Demographic Questionnaire. The demographics questionnaire asked participants to self-report age, gender, sexual orientation, occupation/student, year of school, and major. In addition, participants were asked about the frequency of their physical activity participation.

International Physical Activity Questionnaire (IPAQ; Craig et al., 2003). Participants were asked to indicate the number of days over the past week that they had participated in each intensity of activity (vigorous, moderate, and walking) for at least 10 minutes (Craig et al., 2003). For each intensity, they were asked to indicate, on average, the length of time they spent on one of those days (Craig et al., 2003). Weekly frequencies were multiplied by minutes for each intensity; these values were then multiplied by known metabolic equivalents (3.3 for walking minutes, 4.0 for moderate-intensities minutes, and 8.0 for vigorous-intensities minutes) respectively and summed to get a total in metabolic minutes per week (Craig et al., 2003).

Body Image Measures. A package of state body image measures were completed (see Appendix B).

State body image was measured using visual analogue scales (VAS). For VAS, participants indicated how they felt at that very moment by placing a tick mark on a horizontal line that was 100 mm in length anchored by opposing terms (e.g., none at one end to very much at the other). Visual analogue scales are particularly effective for assessing state responses as they allow the participants the opportunity to respond to each item quickly. They are also less subject to recall in studies using short interventions, and they allow a wider variability in scores than Likert scales (Heinberg & Thompson, 1995).

Body Image and Mood VAS (Heinberg & Thompson, 1995). This is an 8-item scale used to measure state body image and state mood. The participant was asked to rate how she felt on eight different characteristics: anxious, happy, depressed, angry, fat, satisfied with the body, and
confident. Each item was anchored by *none* to *very much*. Evidence of reliability has been provided (Heinberg & Thompson, 1995; Tiggemann & Slater, 2004).

*State Self-Objectification VAS* (Noll & Fredrickson, 1998; Prichard & Tiggemann, 2012). The State Self-Objectification VAS is a modified version of the Self-Objectification Questionnaire (Noll & Fredrickson, 1998), used to measure state levels of self-objectification. The 10-item scale contained both appearance-based attributes and competency-related attributes. Appearance-based attributes included weight, physical attractiveness, sex appeal, firm/sculpted muscles and measurements, while the competency-related attributes included strength, physical fitness, health, energy level and physical coordination (Noll & Fredrickson, 1998). Each item was anchored by *none* or *very much*. Cronbach’s alpha was calculated for the competency-related attributes and the appearance-based attributes for each condition at each time point, with all values showing adequate internal consistency reliability (competency-related attributes: pre-exercise negative lyrics, $\alpha = .80$; post-exercise negative lyrics: $\alpha = .90$; pre-exercise neutral lyrics, $\alpha = .80$; post-exercise neutral lyrics, $\alpha = .77$; appearance-related attributes: pre-exercise negative lyrics, $\alpha = .90$; post-exercise negative lyrics, $\alpha = .93$; pre-exercise neutral lyrics, $\alpha = .89$; post-exercise neutral lyrics, $\alpha = .92$).

*State Body Appreciation Scale-2 VAS* (VAS; Avalos, Tylka, & Wood-Barcalow, 2005; Slater, Varsani, & Diedrichs, 2017). The State Body Appreciation Scale-2 VAS is a modified version of the Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015a) to assess state body appreciation. It consisted of three items, with each anchored by *Strongly Disagree* to *Strongly Agree* (Avalos et al., 2005; Slater et al., 2017). With the mean of the three items calculated, Slater et al. (2017) provided evidence of factor and convergent validity and internal consistency reliability in a previous study assessing state body appreciation following exposure to media.
images in university women. Cronbach’s alpha was calculated for body appreciation for each condition by time and all values were acceptable (pre-exercise negative lyrics: α = .89; post-exercise negative lyrics, α = .91; pre-exercise neutral lyrics, α = .93; post-exercise neutral lyrics, α = .91).

**Personality Measures Questionnaire**

To uphold the cover story, a short personality questionnaire was completed (see Appendix C). It incorporated three questions from the Rosenberg Self-Esteem Scale (Rosenberg, 1965), three questions from the Task Self-Efficacy Scale (Rodgers & Gauvin, 1998), and seven questions from the Reasons for Exercise Inventory (Silberstein, Streigel-Moore, Timko, & Rodin, 1988). This data was not analyzed.

**Performance Outcomes**

Following each walk or run, the distance travelled in 30 minutes was recorded from the treadmill in miles (see Appendix E).

**Rating of Perceived Exertion**

RPE was measured using the Borg’s RPE Scale (Borg, 1998). Participants indicated how hard they felt they were working during each walk/run using a scale from 0-10, where 0 = *nothing at all* and 10 = *very very strong or maximal* perceived effort (Borg, 1998; see Appendix E).

**Body Mass Index (BMI)**

BMI is an indicator of body composition. It was calculated by dividing the individual’s weight in kilograms by her height in meters$^2$ (Health Canada, 2011). Height and weight were assessed objectively using standard laboratory procedures with shoes and socks off.

**Manipulation Checks**
A series of manipulation checks were completed. The manipulation checks asked the participants what they thought the true purpose of the study was, if the participants noticed any differences between the two playlists, and in general how often they pay attention to the lyrics of a song. In each condition, the music preferences questionnaire was used to determine participants’ perceptions of the two playlists (see Appendix D).

**Procedures**

Potential participants were recruited for a study looking at the relationship between personality characteristics, musical preferences and performance outcomes during exercise, following ethical clearance (see Appendix G). The true purpose of this study was disguised to avoid influencing participants’ responses to the questionnaires. Participants who were interested in completing the study contacted the researcher and received a letter of invitation outlining the inclusion criteria and study requirements. Interested participants set up a mutually convenient time for the first session. She was instructed to come to the Exercise Intervention Laboratory (WH 16) on campus with proper exercise clothes and running shoes.

Once at the laboratory, participants provided informed consent. The participant then completed the demographics questionnaire, the PAR-Q+ (CSEP, 2012) which determined if she was cleared to participate in physical activity, and the IPAQ questionnaire (Craig et al., 2003).

The participant then completed the Personality Measures Questionnaire to uphold the cover story. Then she completed the pre-exercise body image and mood questionnaire package which included the VAS (Heinberg & Thompson, 1995), the State Self-Objectification VAS (Noll & Fredrickson, 1998) and the Body Appreciation Scale-2 VAS (Avalos et al., 2005; Slater et al., 2017). Next, the participant completed a 5-minute warm-up by walking on the treadmill at a comfortable pace without running, with no music playing (in both conditions), followed by a 30-
minute walk/run, with the assigned music depending on the condition (see below for description of the experimental conditions). Conditions were counterbalanced. Participants were able to control the speed and were asked to walk or run as far as they could within the 30 minutes for each session. The participants were also instructed to match their mode of exercise for the second session (i.e., if the participant walked for the first session she also walked for the second session).

Once the 30-minute walk/run was completed, distance was recorded and the participant completed the post-manipulation measures of body image and mood, RPE, and the music preferences questionnaire. Participants then completed a 5-minute cool down walk on the treadmill, with no music playing in either condition. After completing the first session, a mutually convenient time to complete the final session with the researcher was set, separated by at least 48 hours apart.

At the second session, participants completed the Personality Measures Questionnaire followed by the state body image measures and then completed the 5-minute warm-up without any music playing. Once the warm-up was completed, the participant completed the 30-minute walk/run in the other condition (negative music condition or neutral music condition), where they were asked to run or walk (consistent with what they had done in the first session) as far as they could during that time. After completing the 30-minute treadmill task, the distance travelled was recorded in miles, and participants completed the state body image and mood measures, and RPE, followed by 5-minute cool down (with no music playing). Participants then completed the manipulation checks. Finally, height and weight were measured to ensure that it did not influence participants’ responses to the body image measures. The researcher provided each participant with her performance results from each session if desired. Participants were then debriefed by
the researcher as to the true purpose of the study and were asked to provide final informed consent. Participants received $5 compensation for each visit, for a total of $10.

**Pilot Study.** A pilot study was completed to determine whether the playlists (music with positive body image lyrics, music with negative body image lyrics and music with neutral body image messages) resulted in different body image and mood outcomes at rest, where three different music playlists were used. Ten female participants completed the pilot study, where participants listened to the three playlists at rest (positive, negative and control) on three separate occasions, and answered several measures of body image and mood. A series of repeated measures ANOVAs showed that for the measures of feeling fat, participants reported lower scores in the positive condition compared to the negative and the neutral conditions ($p < 0.08$). Positive affect was reported higher in the negative and the positive music conditions compared to the control playlist ($p < 0.08$). In addition, participants reported enjoying the negative playlist most (need stats here). Based on the results and participant feedback from the pilot study, changes were made to the playlists in the current study, and only the negative and neutral playlists were used.

**Experimental Manipulation**

**Negative Music Condition.** Songs were selected that had negative body image messages, that described negative or objectifying portrayals of the female body or reinforced the ideal female body (Flynn et al., 2016).

**Neutral Music Condition.** Songs were selected that did not reference the ideal female body.

**Playlists.** The music for the two music conditions was played through a speaker system from a laptop. The songs and their order were the same for all participants in their respective
conditions, and the volume remained the same for each participant. All songs were selected from the Canadian iTunes top 100 chart from the last five years. The bpm for all songs were 120 - 160, determined using the computer software “Virtual DJ Home” (Virtual DJ Home, 7.0.5, 2016). This bpm range is considered motivational for exercise (Terry & Karageorghis, 2006). For each song, the researcher recorded the number of bpm, the year of the song, the peak chart number, the total number of days on the chart, and a lyric analysis. The playlists were matched on each of the criteria to ensure similarity between both conditions for bpm (i.e., motivational property) and popularity (i.e., year of release, top chart number and number of days on the charts) as popularity and familiarity is thought to influence cultural associations (Karageorghis, 2017).

For the lyric analysis, each song in the negative lyric condition was examined and the number of occurrences of objectifying lyrics, lyrics that shamed the female body or represented the thin ideal were counted and recorded. For example, phrases were counted as representing the thin ideal if the lyrics addressed the cultural standard of beauty such as the lyrics from the song “Hula Hoop” by Omi, “Girl you got that body with them curves like a Bugatti” (Omi, 2015). Phrases were counted as objectifying lyrics if the lyrics treated women as objects (i.e., to be used by others) or referenced specific body parts, such as the lyrics from the song “Tip Toe” by Jason Derulo, “Bring that body my way, shake something when you tip toe” (Tip Toe, 2017). Phrases were counted as shaming the female body if the lyrics described how not meeting the ideal was a negative outcome related to failure, such as the lyrics from the song “All About That Bass” by Meghan Trainor, “I’m bringing booty back, go ahead and tell them skinny bitches that” (All About That Bass, 2014). All songs in the negative condition had at least ten distinct occurrences of negative lyrics. Then, then two playlists were provided to a group of graduate students who
were asked to determine which condition (negative or neutral) each song belonged in. All students correctly categorized the conditions. Although gender of the artist was not controlled for explicitly, the two conditions showed approximately equal ratios of male and female artists (5 male artists and 4 female artists in both the negative and neutral condition). Please refer to Appendix F for the music playlists.

**Data Screening and Analysis**

All data was entered into SPSS for data analysis.

*Missing and implausible values.* The data was screened visually for any missing or implausible values. Implausible values as a result of data entry errors were corrected. Any missing values were replaced with the series mean.

*Outliers.* The data was screened visually for any potential outliers. Standardized scores were calculated; any scores that were greater than ± 3.29 were flagged as potential outliers. Any outliers were replaced with the next highest mean score (Field, 2013).

*Descriptives and correlations.* Means and standard deviations for each measure were calculated by group. In addition, Pearson correlations between study variables were calculated.

*Normality.* Skewness and kurtosis values were examined to determine normality of the data. Any skewness or kurtosis values greater than ± 3 signifies an abnormal distribution (Field, 2013). If a normal distribution was not found, the appropriate transformation was completed to meet the assumption of normality (Field, 2013).

*Hypothesis testing.* In order to determine whether body image during a running task differed between music with negative body image lyrics and music with neutral lyrics, a series of repeated measures ANOVAs (one for each outcome) was conducted, with condition (negative music, neutral music) as the independent repeated factor, and post-run state body image
measures as the dependent variables. Correlations were run between dependent variables and BMI scores.
CHAPTER 4: RESULTS

Data Screening

*Means and implausible values.* There were two instances of missing data. These missing values were replaced with the series mean.

*Outliers.* For the anger item, two values were identified as outliers, one score in the pre-negative condition and one score in the post-neutral condition. Both the scores were greater than $\pm 3.29$ SD and they were replaced with the next highest mean score.

*Normality.* Skewness and kurtosis values for all variables were less than three. Thus, the assumption of normality was met.

Descriptive Statistics

Means and standard deviations were calculated for each variable pre-exercise and post-exercise in each condition (see Table 2).

Table 2

*Means and Standard Deviations (SD) for All Measures by Condition*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Neutral Pre-Manipulation ($n = 29$)</th>
<th>Neutral Post-Manipulation ($n = 29$)</th>
<th>Negative Pre-Manipulation ($n = 29$)</th>
<th>Negative Post-Manipulation ($n = 29$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxious</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>29.33 (24.01)</td>
<td>14.95 (17.99)</td>
<td>36.17 (27.69)</td>
<td>15.83 (17.18)</td>
</tr>
<tr>
<td>Depressed</td>
<td>23.36 (25.32)</td>
<td>11.34 (16.25)</td>
<td>24.45 (27.09)</td>
<td>12.31 (15.28)</td>
</tr>
<tr>
<td>Angry</td>
<td>8.78 (12.66)</td>
<td>3.19 (4.64)</td>
<td>9.87 (11.23)</td>
<td>7.72 (11.88)</td>
</tr>
<tr>
<td>Happy</td>
<td>62.41 (19.45)</td>
<td>70.12 (17.92)</td>
<td>60.60 (19.45)</td>
<td>67.31 (20.39)</td>
</tr>
<tr>
<td>Confident</td>
<td>57.41 (20.46)</td>
<td>66.29 (20.68)</td>
<td>58.55 (22.24)</td>
<td>67.41 (19.26)</td>
</tr>
<tr>
<td>Feeling Fat</td>
<td>45.16 (28.09)</td>
<td>34.81 (27.65)</td>
<td>42.33 (29.37)</td>
<td>30.72 (23.85)</td>
</tr>
<tr>
<td>Physically Attractive</td>
<td>43.21 (14.14)</td>
<td>48.17 (22.54)</td>
<td>47.07 (19.14)</td>
<td>52.91 (20.14)</td>
</tr>
<tr>
<td>Satisfied with Body</td>
<td>42.17 (23.78)</td>
<td>48.71 (25.88)</td>
<td>42.43 (21.57)</td>
<td>53.15 (25.91)</td>
</tr>
<tr>
<td>Body Appreciation</td>
<td>57.67 (24.03)</td>
<td>64.37 (23.57)</td>
<td>55.99 (22.44)</td>
<td>64.03 (24.59)</td>
</tr>
<tr>
<td>Self-Objectification</td>
<td>11.27 (9.34)</td>
<td>8.16 (12.41)</td>
<td>9.25 (11.12)</td>
<td>10.55 (7.55)</td>
</tr>
<tr>
<td>RPE</td>
<td>___</td>
<td>5.09 (2.46)</td>
<td>___</td>
<td>4.97 (2.28)</td>
</tr>
<tr>
<td>Distance</td>
<td>___</td>
<td>2.24 (0.68)</td>
<td>___</td>
<td>2.25 (0.67)</td>
</tr>
</tbody>
</table>
Note. Scores range from 0 to 100 for all body image and mood variables, with a score of zero representing low levels. RPE = rating of perceived exertion, ranges 0-10; distance measured in miles.

Correlations

Correlations between all variables were calculated. Generally speaking, all variables showed small to moderate correlations in the expected directions. Physical activity was not related to body image measures (see Table 3).

Manipulation Checks

No participant was able to correctly identify the purpose of the study. Only one participant was able to identify the true difference between the playlists; several participants incorrectly perceived a difference in tempo between the two playlists. Participants reported they generally pay attention to the lyrics of a song with a mean value of 2.70 (0.85) out of 5, where 2 is characterized as sometimes and 3 is characterized as often.

Hypothesis Testing

Ten 2-way repeated measures ANOVAS were conducted, one for each dependent variable, where the condition (negative and neutral) and time point (pre and post) were the independent repeated factors, and the state body image/mood measures were the dependent variables. There were no significant interaction effects (all ps > .05). There were no significant effects of condition for any variables (all ps > .05). However, results indicated a statistically significant effect for time for all variables, except for state self-objectification. Specifically, following both conditions participants reported lower levels of anxiety, $F(1, 28) = 43.60, p < 0.001, n^2 = 0.61$, depression, $F(1, 28) = 14.93, p = 0.001, n^2 = 0.35$, anger, $F(1, 28) = 4.40, p < 0.05, n^2 = 0.14$, feeling fat, $F(1, 28) = 13.53, p = 0.001, n^2 = 0.334$ and higher levels of happiness, $F(1, 28) = 13.96, p = 0.001, n^2 = 0.95$, confidence, $F(1, 28) = 9.15, p = 0.005, n^2 =$
0.83, \( n^2 = 0.94 \), body appreciation, \( F(1, 28) = 25.18, p < 0.001, n^2 = 0.47 \), feeling physically attractive, \( F(1, 28) = 5.66, p < 0.05, n^2 = 0.17 \), and body satisfaction, \( F(1, 28) = 8.46, p < 0.01, n^2 = 0.23 \). There was no time effect for self-objectification (\( p > .05 \)). Two paired samples t-tests were conducted for the variables of distance travelled and RPE. No statistically significant differences were found between conditions [distance travelled: \( t(28) = 0.45, p = 0.65 \); RPE: \( t(28) = 0.42, p = 0.68 \)].
Table 3

Pearson Bivariate Correlations Between Study Variables by Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anxious</td>
<td>--</td>
<td>.57**</td>
<td>-.24</td>
<td>-.48**</td>
<td>-.45*</td>
<td>.23</td>
<td>-.27</td>
<td>-.12</td>
<td>-.07</td>
<td>.01</td>
<td>.20</td>
<td>.17</td>
<td>.21</td>
</tr>
<tr>
<td>2. Depressed</td>
<td>.75**</td>
<td>--</td>
<td>.50**</td>
<td>-.58**</td>
<td>-.59**</td>
<td>.20</td>
<td>-.23</td>
<td>.03</td>
<td>.08</td>
<td>-.14</td>
<td>.13</td>
<td>-.04</td>
<td>.28</td>
</tr>
<tr>
<td>3. Angry</td>
<td>.75**</td>
<td>.74**</td>
<td>--</td>
<td>-.23</td>
<td>-.15</td>
<td>.05</td>
<td>.11</td>
<td>.26</td>
<td>.62</td>
<td>.48</td>
<td>.07</td>
<td>.34</td>
<td>.20</td>
</tr>
<tr>
<td>4. Happy</td>
<td>-.40*</td>
<td>-.44*</td>
<td>-.37</td>
<td>--</td>
<td>.79**</td>
<td>-.14</td>
<td>.52**</td>
<td>.18</td>
<td>.77</td>
<td>.25</td>
<td>.03</td>
<td>-.13</td>
<td>.23</td>
</tr>
<tr>
<td>5. Confident</td>
<td>-.31</td>
<td>-.35</td>
<td>-.18</td>
<td>.87**</td>
<td>--</td>
<td>-.34</td>
<td>.60**</td>
<td>.30</td>
<td>-.21</td>
<td>.53**</td>
<td>-.01</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>6. Feeling Fat</td>
<td>.34</td>
<td>.13</td>
<td>.24</td>
<td>-.32</td>
<td>-.45*</td>
<td>--</td>
<td>-.36</td>
<td>-.62**</td>
<td>.49**</td>
<td>-.62**</td>
<td>.16</td>
<td>-.06</td>
<td>.32</td>
</tr>
<tr>
<td>7. Physically Attractive</td>
<td>-.24</td>
<td>-.25</td>
<td>-.32</td>
<td>.46*</td>
<td>.58**</td>
<td>-.30</td>
<td>--</td>
<td>.47*</td>
<td>-.56**</td>
<td>.51**</td>
<td>-.09</td>
<td>.14</td>
<td>-.11</td>
</tr>
<tr>
<td>8. Satisfied with Body</td>
<td>-.00</td>
<td>.03</td>
<td>.04</td>
<td>.19</td>
<td>.39*</td>
<td>-.53**</td>
<td>.64**</td>
<td>--</td>
<td>-.20</td>
<td>.60**</td>
<td>-.28</td>
<td>.26</td>
<td>-.26</td>
</tr>
<tr>
<td>9. Self-Objectification</td>
<td>.26</td>
<td>.27</td>
<td>.29</td>
<td>-.12</td>
<td>-.30</td>
<td>.42*</td>
<td>-.56**</td>
<td>-.67**</td>
<td>--</td>
<td>.47**</td>
<td>.07</td>
<td>.08</td>
<td>.35</td>
</tr>
<tr>
<td>10. Body Appreciation</td>
<td>-.18</td>
<td>-.19</td>
<td>-.13</td>
<td>.45*</td>
<td>.55**</td>
<td>-.73**</td>
<td>.38*</td>
<td>.60**</td>
<td>-.56**</td>
<td>--</td>
<td>-.02</td>
<td>-.22</td>
<td>-.40*</td>
</tr>
<tr>
<td>11. Age</td>
<td>-.09</td>
<td>-.12</td>
<td>-.13</td>
<td>.33</td>
<td>.38*</td>
<td>-.09</td>
<td>-.04</td>
<td>-.20</td>
<td>-.16</td>
<td>.03</td>
<td>--</td>
<td>.49**</td>
<td>.38*</td>
</tr>
<tr>
<td>12. IPAQ</td>
<td>.22</td>
<td>.03</td>
<td>.13</td>
<td>-.31</td>
<td>-.20</td>
<td>.26</td>
<td>.07</td>
<td>.11</td>
<td>-.11</td>
<td>-.19</td>
<td>-.45**</td>
<td>--</td>
<td>.21</td>
</tr>
<tr>
<td>13. BMI</td>
<td>.03</td>
<td>-.14</td>
<td>.07</td>
<td>-.08</td>
<td>-.31</td>
<td>.54**</td>
<td>-.25</td>
<td>-.42</td>
<td>.58**</td>
<td>.42*</td>
<td>-.38*</td>
<td>-.21</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. Neutral music condition above the diagonal, negative condition below the diagonal. IPAQ = International Physical Activity Questionnaire, BMI = Body mass index.

** p < 0.01, * p < 0.05
CHAPTER 5: DISCUSSION

The purpose of this study was to examine whether pop music with negative body image lyrics (compared to neutral lyrics) elicited negative effects on body image and mood during exercise in female university exercisers. This study showed that, contrary to the hypotheses, there was generally no negative impact of music with negative body image lyrics on body image and mood during exercise. Rather in both condition positive body image and mood outcomes were improved following the manipulation.

Body Image and Mood Outcomes

Participating in an acute bout of exercise has shown to lead to increases in positive body image outcomes, such as increases in body satisfaction, appreciation and positive mood states (Lepage & Crowther 2010; Salci & Martin Ginis, 2017). While the results of the present study are not consistent with the findings of previous research regarding the effects of music videos on body image (Bell et al., 2007; Mischener et al., 2013; Prichard & Tiggemann, 2012; Tiggemann & Slater, 2004) they do support research showing the positive effects of an acute bout of exercise on body image and mood as the women reported improvements in all body image and mood outcomes (with the exception of state self-objectification) following exercise (Lamarche & Gammage, 2010; Lamarche et al., 2009; Gammage et al., 2016). There is a growing body of research that shows the positive body image effects of an acute bout of exercise (Lamarche & Gammage, 2010; Lamarche et al., 2009; Gammage et al., 2016). For example, Lamarche and colleagues (2009) found increases in self-presentational efficacy following a step aerobics class whether performed in front of a mirror not, in university women. Similarly, Gammage et al. (2016) found that following both a single yoga and resistance class, women reported higher
levels of body satisfaction and decreases in state social physique anxiety. These changes may be
due to an emphasis on what the body can do, rather than what it looks like, during exercise,
distraction from concerns with appearance, or overall improvements in mood that result from
exercise. The explanation that exercise may override any potential negative effects of the music
lyrics is consistent with Prichard and Tiggemann’s (2012) study in which participants viewed
physique-salient music videos while completing a treadmill exercise task. Results from these
studies suggest that exercise acts as a potential buffer from the negative effects of media, both
music videos and music alone (Prichard & Tiggemann, 2012).

Previous research has shown increases in negative body image outcomes and decreases in
positive mood states following viewing music videos that have appearance-focused or
objectifying images in young women (Bell et al., 2007; Mischener et al., 2013; Prichard &
Tiggemann, 2012; Tiggemann & Slater, 2004). For example, compared to viewing non-physique
salient or non-objectifying music videos, women have reported feeling more dissatisfied with
their bodies and experiencing lower levels of body-esteeem, as well as larger perceived-ideal body
size discrepancies (i.e., women perceived their bodies to be larger than they were) and decreases
in positive mood states after viewing appearance-focused music videos (Mischener et al., 2013;
Prichard & Tiggemann, 2012; Bell et al., 2007; Tiggemann & Slater, 2004). By contrast, in the
present study, university women reported feeling higher body satisfaction, body appreciation,
reported feeling less fat and higher levels of physical attractiveness, happiness, confidence, and
body satisfaction, as well as decreases in levels of anxiety, depression and anger following
completion of the both music conditions. In fact, a significant time effect was seen for all
variables with the exception of state self-objectification, with positive body image and mood
states increasing, and negative body image and mood states decreasing. Similar results were seen
for mood states in the study by Prichard and Tiggemann (2012), where participants who
completed the exercise condition while watching appearance-focused music videos reported
feeling less anxious and depressed and reported feeling happier, more physically attractive and
more confident, and lower levels of state self-objectification. Moreover, in the study conducted
by Laukka and Quick (2011) participants were asked to report how they used music with regards
to exercise. Participants reported positive changes in mood and emotion for hours after exercise.
Results of this study provide further evidence that exercise can have positive effects on mood,
specifically decreases in negative mood states such as feelings of anxiety, depression, and anger.

There are several potential explanations for why the results in this study were inconsistent
with the hypotheses with regards to the effects of negative appearance-focused lyrics on body
image and mood outcomes. Firstly, positive body image and mood measures (with the exception
of state self-objectification) may have improved because of the motivational properties of the
music itself. Music in both conditions was at least 120 bpm, which is how motivational music is
most frequently characterized (Karageorghis et al., 2006). Karageorghis and colleagues (2006)
have argued that with regards to motivational music, the musicality components are more
important (i.e., the rhythm response and the musicality) in terms of producing positive
motivational responses compared to the cultural impact and personal associations. Thus, because
both playlists were made up of what is considered motivational music, the music could have
overridden the effects of negative appearance-focused lyrics, consistent with the model (Terry &
Karageorphis, 2006). The use of the motivational music could also explain the increases in mood
outcomes, as previous studies have shown that the use of music during exercise results in
increases in positive mood states and as well as decreases in negative mood states (Karageorphis
& Priest, 2012; Laukka & Quick, 2011).
The sample in the current study consisted of women who were regular exercisers, whereas previous studies did not recruit regular exercisers explicitly (Mischener et al., 2013; Prichard & Tiggemann, 2012). In fact, the majority of studies did not consider physical activity status at all. While Prichard and Tiggemann (2012) did not explicitly recruit exercisers for their study, their sample was highly active (on average, they exercised approximately 4 hours per week), and they found similar beneficial effects of exercise on body image while watching music videos. It is possible that women who regularly engage in physical activity are less susceptible to effects of media on body image, particularly during exercise. Further, previous research has indicated that women who are more active tend to have more positive body image, including placing a greater emphasis on function rather than appearance (Tylka & Wood-Barcalow, 2015b). Further, Tylka and Wood-Barcalow (2015b) suggested that positive body image may serve as a protective mechanism, whereby positive body image is accepted, and negative body image information is filtered out; thus, for this sample of active women, they may have rejected the negative messages in the appearance-focused playlist.

Third, it is possible that physique salient images may pose a larger threat to body image outcomes than lyrics alone. For example, Bell and colleagues (2007) found greater increases in body dissatisfaction following viewing appearance-focused music videos compared to just hearing the music and lyrics alone. This study highlights that the visual component may be more important to influencing body image outcomes than the words alone. The images in the music videos are clear representations of the ideal body type for women. Further the music videos may have had a greater impact as the participant was receiving both a visual and audio cue. Images may also be faster to process; by contrast, listening to the lyrics requires individuals to process then create their own images in their mind, which may or may not be consistent with the societal
ideal. Further, studies examining the effects of traditional media on body image have generally focused on purely visual mediums, such as magazines, pictures or television. They have also linked media images to decreases in body appreciation, body satisfaction and increases in body dissatisfaction (Andrew et al., 2016; Groesz et al., 2002). Together, these studies suggest that visual component of music videos may have a more detrimental effect on body image than music lyrics alone.

While most body image and variables improved following exercise, self-objectification did not improve. One explanation for the lack of change in state self-objectification could be due to the mode of exercise in this study. The women in this study completed cardiovascular exercise (i.e., a treadmill exercise task), where they were asked to either walk or run at their own self-selected pace for 30 minutes. However, cardiovascular exercises have been linked to appearance-focused motives in women (Prichard & Tiggemann, 2008), perhaps because this type of exercise is typically used to modify appearance (and specifically burn calories and lose weight), compared to physical activities such as yoga or resistance training. Further, exercises such as yoga, resistance training and belly dancing have led to improvements in positive body image and decreases in state self-objectification, as the motives are generally more functional compared to appearance-related motives (Gammage et al., 2016; Tiggemann et al., 2014). Along with exercise modality, exercise location also has is related to self-objectification. Women who exercised outside of gym settings report lower levels of state self-objectification compared to women who exercise in a gym setting (Prichard & Tiggemann, 2005). The women in this study may not have experienced positive changes in levels of state self-objectification, as the mode of exercise and location of exercise has been linked to appearance-related behaviors and increases in self-objectification (Prichard & Tiggemann, 2008).
RPE and Distance Travelled

Contrary to previous findings, results from this study did not show differences in RPE or distance travelled based on condition. In general, music has been shown to have positive effects on RPE, with participants reporting feeling that they work less hard during exercise, even though objective performance outcomes indicated that they actually worked harder (e.g., travelled a further distance; Eliakim et al., 2012). One explanation for this outcome could be due to the exercise instructions, as the participants were asked to complete a walk or run at their own preferred pace. Participants were instructed to try and cover as much distance as possible within the 30-minute treadmill task, but they could achieve that by walking or running at their own pace. Previous studies have generally instructed participants to complete the task at their maximal work output (e.g., Eliakim et al., 2012; RamezanPour et al., 2012). In the present study, participants’ RPE was general around the midpoint of the scale (negative condition was 4.96 and neutral condition 5.08). By contrast, in previous research, participants have reported RPE values closer to 8 out of 10 (Eliakim et al., 2012), indicating a higher intensity of exercise. It is possible RPE could differ only with higher intensities of exercise.

Extension to Current Literature

This study helps fill a gap in both the music and physical activity literature and the body image literature. This study was the first to examine the effects of pop music lyrics on body image during exercise. The results of this study highlight that exercise may help to negate the potential negative effects of appearance-focused lyrics in popular music that represent the thin ideal body type or are objectifying in nature.

Second, this is the first study to examine body image outcomes in response to the use of appearance-related music lyrics during exercise. Previous studies have examined psychological
outcomes including both positive and negative mood states (i.e., happy, sad, anxious, depressed etc.), RPE and levels of enjoyment (Laukka & Quick, 2011; Tate et al., 2012; Hutchinson et al., 2015; Carels et al., 2007). Given that many individuals exercise in gym settings, where the body is the focus of attention, body image outcomes are particularly important to investigate in response to the use of music during exercise.

Within the music and physical activity literature, the majority of the focus has been on the musicality of the song (i.e., the tempo and the beat), with little research examining the effects of the lyrics. The findings of the present study provide support for the model created by Karageorghis and colleagues (2006), which indicates that the most important characteristics of motivational music are the rhythm response and musicality, with cultural impact and personal associations less influential (Terry & Karageorghis, 2006). In the present study, all music was considered motivational as described by this model. The results of this study indicate that motivational music, regardless of the nature of the lyrics, can have positive effects on body image outcomes and mood states, as exercise may buffer these potential negative effects of the lyrics, supporting the model created by Terry and Karageorghis (2006).

**Limitations**

This study was not without limitations that should be identified. This study examined the effects of pop music lyrics on female university students. Thus, the results are only generalizable to young women. Secondly, the sample used for this study were regular exercisers (exercising at least three times per week), and findings may be different with a sample of inactive women. Further, this study used pop music as it is commonly used during exercise and in gym facilities. Therefore, the results from this study can only be generalizable to pop music. Finally, although our pilot work suggested that listening to music with negative lyrics led to several negative body
image outcomes, the present study did not have a control condition in which participants just listened to music to see if the negative appearance focused lyrics had any effects on body image and mood outcomes at rest.

**Future Directions**

Future research should continue to explore the effects of music on body image during exercise. The effects of music on body image in other genres of music are unknown and future research should explore the possible effects of various genres (e.g., rap music, in which the lyrics may be more extreme) to help determine what music is most influential to body image outcomes during exercise. Future research should further look to examine the effects of appearance-focused lyrics on body image during exercise, to see specifically if the extent to which people pay attention to the lyrics influence these body image outcomes. This would require a between-subjects design. The use of a repeated-measures design in the current study limited the extent to which participants could be queried regarding how much they paid attention to the lyrics of the music used in each condition, as asking this question would have primed the participants of the true purpose of the study. Moreover, future research should aim to explore the relationship between lyrics with positive body image messages and the effects on body image in women.

Further, as the use of motivational music is proposed to have beneficial effects on exercise adherence, the effects of lyrics on adherence over time should be explored. If participants report feeling happier, more appreciative of their bodies, more satisfied and confident and less fat, then motivational music might serve as a tool to keep women motivated to continue participating in exercise. The effects of music lyrics during exercise should also be further studied to determine the effects it has in men, and across different age groups, as it may serve as a tool to increase exercise adherence across all ages and genders. If so, it could be a cost-effective way to increase
exercise adherence and enjoyment with minimal risk of negative outcomes.

**Implications**

The findings of this study suggest the use of appearance-focused music in an exercise setting may not be harmful to body image outcomes and mood states in women. Moreover, the use of music in an exercise setting may be used to keep women motivated and happy, which could in turn have improvements in exercise adherence. Thus, the music used in a gym setting should be chosen based on the motivational properties of music, to maximize the positive benefits of music on positive mood states and body image outcomes.

**Conclusion**

In conclusion, this study aimed to explore the relationship between pop music lyrics and body image and mood outcomes during exercise. Women who were regular exercisers, when exercising on a treadmill, left the session feeling happier, more confident, more appreciative and satisfied with their bodies, while feeling less anxious, depressed and angry, regardless of whether they listened to music with appearance-focused or neutral lyrics. As previous research has highlighted, the use of music during exercise leads to many benefits on psychological, physiological and psychophysical outcomes (Terry & Karageorghis, 2006) and this study highlights the positive benefits on psychological outcomes such as mood and body image, aligning with previous research. Music during exercise may result in women feeling happier, feeling more appreciative and satisfied with their bodies, less anxious, depressed and angry as well as feeling more confident following exercise, ultimately improving their overall exercise experience.
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Appendix A: Baseline Questionnaires

2015 PAR-Q+
The Physical Activity Readiness Questionnaire for Everyone

The health benefits of regular physical activity are clear; more people should engage in physical activity every day of the week. Participating in physical activity is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

GENERAL HEALTH QUESTIONS

Please read the 7 questions below carefully and answer each one honestly: check YES or NO.

1) Has your doctor ever said that you have a heart condition OR high blood pressure?

2) Do you feel pain in your chest at rest, during your daily activities of living, OR when you do physical activity?

3) Do you lose balance because of dizziness OR have you lost consciousness in the last 12 months?
   Please answer NO if your dizziness was associated with over-breathing (including during vigorous exercise).

4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? PLEASE LIST CONDITION(S) HERE:

5) Are you currently taking prescribed medications for a chronic medical condition?
   PLEASE LIST CONDITION(S) AND MEDICATIONS HERE:

6) 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? Please answer NO if you had a problem in the past, but it does not limit your current ability to be physically active.

7) Has your doctor ever said that you should only do medically supervised physical activity?

If you answered NO to all of the questions above, you are cleared for physical activity.
Go to Page 4 to sign the PARTICIPANT DECLARATION. You do not need to complete Pages 2 and 3.

- Start becoming much more physically active — start slowly and build up gradually.
- Follow International Physical Activity Guidelines for your age (www.who.int/dietphysicalactivity/en/).
- You may take part in a health and fitness appraisal.
- If you are over the age of 45 yr and NOT accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.
- If you have any further questions, contact a qualified exercise professional.

If you answered YES to one or more of the questions above, COMPLETE PAGES 2 AND 3.

⚠️ Delay becoming more active if:

- You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
- You are pregnant — talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at www.eparmedx.com before becoming more physically active.
- Your health changes — answer the questions on Pages 2 and 3 of this document and/or talk to your doctor or a qualified exercise professional before continuing with any physical activity program.
Demographic Questionnaire

1. Age: ________________________________

2. Gender: _______________________________

3. Ethnicity/Background: __________________________

4. Sexual Orientation: __________________________

5. Occupation: __________________________

6. Year of School: __________________________

7. Major: __________________________

8. How many times per week do you engage in physical activity?

   __________________________________________________________________________

9. What types of physical activity do you participate in?

   __________________________________________________________________________
International Physical Activity Questionnaire (short)

The questions are about your time you spent being physically active in the last 7 days. They include questions about activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Please answer each question even if you do not consider yourself to be an active person.

In answering the following questions,

- **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal.
- **Moderate** physical activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

1a. During the last 7 days, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

Think about **ONLY** those physical activities that you did for at least 10 minutes at a time.

_______ days per week  

1b. How much time in total did you usually spend on one of those days during vigorous physical activities?

___ hours ______ minutes

OR

None

2a. Again, think **ONLY** about those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles in tennis? DO NOT include walking.

_______ days per week  

2b. How much time in total did you usually spend on one of those days during moderate physical activities?

___ hours ______ minutes

OR

None

3a. During the last 7 days, on how many days did you do **walk** for at least 10 minutes at a time? This includes walking at work and at home, walking to travel from place to place, and any other walking that you did solely for recreation, sport, exercise or leisure.

_______ days per week  

3b. How much time in total did you usually spend walking on one of those days?

___ hours ______ minutes

OR

None
Appendix B: Body Image Questionnaires

Visual Analogue Scale

Place a mark on the line for each mood state for how you are feeling right now from “none” to “very much”

Anxious

Depressed

Angry

Happy

Confident

Fat
Physically Attractive

Satisfied with my body size and shape
State Self-Objectification VAS Questionnaire

Place a mark on the line for how important each item is to you right now from “none” to “very much”

Physical Coordination

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>

Health

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>

Weight

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>

Strength

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>

Sex Appeal

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>

Physical Attractiveness

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>

Energy Level

<table>
<thead>
<tr>
<th>None</th>
<th>Very much</th>
</tr>
</thead>
</table>
Firm/Sculpted Muscles

None

Physical Fitness

None

Measurements (e.g., chest, waist, hips)

None
State Body Appreciation-2 Visual Analogue Scale

Place a mark on the line for each mood state for how you are feeling right now from “strongly disagree” to “strongly agree”

Despite my flaws, I accept my body for what it is

[Mark placement]

Strongly Disagree          Strongly Agree

My feelings towards my body are positive for the most part

[Mark placement]

Strongly Disagree          Strongly Agree

My self-worth is independent of my body shape or weight

[Mark placement]

Strongly Disagree          Strongly Agree
Appendix C: Personality Questionnaires

Personality Characteristics

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle 4. If you agree with the statement, circle 3. If you disagree, circle 2. If you strongly disagree, circle 1.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

____ 1. On the whole, I am satisfied with myself

____ 2. I certainly feel useless at times.

____ 3. I feel that I’m a person of worth, at least on an equal plane with others.

Please state your CONFIDENCE in your abilities to PERFORM the following behaviours.

Use the scale below to answer.

WRITE the confidence value (%) for each behaviour in the space provided.

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>No confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Completely confident</td>
</tr>
</tbody>
</table>

How confident are you that you can:

1. Carry out three runs for 30 minutes? ______

2. Follow directions from the trainer/researcher? ______

3. Put forth maximal effort during all runs? ______
Please rate how IMPORTANT each of the following reasons are for engaging in exercise are to you.

1. To improve my overall health
2. To improve my endurance, stamina
3. To alter specific areas of my body
4. To improve my appearance
5. To have fun
6. To cope with stress, anxiety
7. To meet new people
Appendix D: Manipulation Check

Musical Preferences

Please identify your response by circling the most accurate number which represents your answer. Identify between 1 being not at all, 3 being somewhat likely, and 5 being definitely.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Not Likely</th>
<th>Somewhat Likely</th>
<th>Very Likely</th>
<th>Definitely</th>
</tr>
</thead>
<tbody>
<tr>
<td>How likely would you be to listen to this music again?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Is this the type of music you would be likely to listen to on your own during exercise?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please identify your response by circling the most accurate number which represents your answer. Identify between 1 being not at all, 3 being somewhat, and 5 being very much.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A Small Amount</th>
<th>Somewhat Amount</th>
<th>A Fair Amount</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much did you enjoy the music that was played?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Did you find the music to be motivating?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Manipulation Check

What do you think the true purpose of this study is?
______________________________________________________________________________
______________________________________________________________________________

Did you notice any differences between the two playlists?
______________________________________________________________________________
______________________________________________________________________________

How much do you generally pay attention to the lyrics of a song?
______________________________________________________________________________
______________________________________________________________________________
Appendix E: Performance Outcomes

Performance Outcomes

Session 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Distance</th>
<th>Average Speed</th>
</tr>
</thead>
</table>

Session 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Distance</th>
<th>Average Speed</th>
</tr>
</thead>
</table>

Rate of Perceived Exertion

Please circle the number that best describes your level of exertion

- 0  Nothing at all
- 0.5 Extremely Weak  (Just Noticeable)
- 1  Very Weak  (Light)
- 2  Weak  (Weak)
- 3  Moderate
- 4  Somewhat Strong
- 5  Strong  (Heavy)
- 6
- 7  Very Strong
- 8
- 9
- 10 Very, Very Strong  (Max)
Appendix F: Music Playlists

<table>
<thead>
<tr>
<th>Song</th>
<th>BPM</th>
<th>Year</th>
<th>Top Chart #</th>
<th>Days on Chart</th>
<th>Lyrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Blurred Lines</td>
<td>120</td>
<td>2013</td>
<td>13</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>2. All About that Bass</td>
<td>134</td>
<td>2015</td>
<td>1</td>
<td>343</td>
<td>12</td>
</tr>
<tr>
<td>3. Get Ugly</td>
<td>126</td>
<td>2015</td>
<td>56</td>
<td>48</td>
<td>35</td>
</tr>
<tr>
<td>4. Booty</td>
<td>129</td>
<td>2017</td>
<td>26</td>
<td>45</td>
<td>52</td>
</tr>
<tr>
<td>5. Clothes Off</td>
<td>120</td>
<td>2015</td>
<td>13</td>
<td>118</td>
<td>12</td>
</tr>
<tr>
<td>6. Tip Toe</td>
<td>123</td>
<td>2017</td>
<td>16</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>7. Anaconda</td>
<td>130</td>
<td>2014</td>
<td>3</td>
<td>123</td>
<td>39</td>
</tr>
<tr>
<td>8. Hula Hoop</td>
<td>122</td>
<td>2015</td>
<td>8</td>
<td>173</td>
<td>10</td>
</tr>
<tr>
<td>9. Dirty Sexy Money</td>
<td>160</td>
<td>2017</td>
<td>15</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Song</th>
<th>BPM</th>
<th>Year</th>
<th>Top Chart #</th>
<th>Days on Chart</th>
<th>Lyrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Summer</td>
<td>128</td>
<td>2014</td>
<td>3</td>
<td>187</td>
<td>Neutral</td>
</tr>
<tr>
<td>2. Ain’t Your Mamma</td>
<td>120</td>
<td>2016</td>
<td>10</td>
<td>58</td>
<td>Neutral</td>
</tr>
<tr>
<td>3. Break Free</td>
<td>130</td>
<td>2014</td>
<td>1</td>
<td>193</td>
<td>Neutral</td>
</tr>
<tr>
<td>4. Green Light</td>
<td>129</td>
<td>2017</td>
<td>2</td>
<td>97</td>
<td>Neutral</td>
</tr>
<tr>
<td>5. Fireproof</td>
<td>128</td>
<td>2016</td>
<td>13</td>
<td>177</td>
<td>Neutral</td>
</tr>
<tr>
<td>6. Castle on the hill</td>
<td>135</td>
<td>2017</td>
<td>2</td>
<td>425</td>
<td>Neutral</td>
</tr>
<tr>
<td>7. Geronimo</td>
<td>143</td>
<td>2015</td>
<td>30</td>
<td>143</td>
<td>Neutral</td>
</tr>
<tr>
<td>8. I Want You to Know</td>
<td>130</td>
<td>2015</td>
<td>4</td>
<td>100</td>
<td>Neutral</td>
</tr>
<tr>
<td>9. Wait</td>
<td>126</td>
<td>2017</td>
<td>22</td>
<td>71</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Appendix G: Certificate of Ethics Clearance

Brock University
Research Ethics Office
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

Bioscience Research Ethics Board

Certificate of Ethics Clearance for Human Participant Research

DATE: 1/18/2017

PRINCIPAL INVESTIGATOR: GAMMAGE, Kimberley - Kinesiology

FILE: 16-183 - GAMMAGE

TYPE: Masters Thesis/Project

STUDENT: Alyssa Jackson

SUPERVISOR: Kimberley Gammage

TITLE: Study 1: Personality and Music Preferences, Study 2: Personality and Music Preferences During Exercise

ETHICS CLEARANCE GRANTED

Type of Clearance: NEW

Expiry Date: 1/31/2018

The Brock University Bioscience Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University’s ethical standards and the Tri-Council Policy Statement. Clearance granted from 1/18/2017 to 1/31/2018.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 1/31/2018. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at http://www.brocku.ca/research/policies-and-forms/research-forms.

In addition, throughout your research, you must report promptly to the REB:

a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved:

Sandra Peters, Chair
Bioscience Research Ethics Board

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.