No Girls Allowed:
A Psychosocial Examination of Women's Relationship to Strength Training and the Weight Room

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Holly E. Crane

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Abstract

Introduction: Despite the many physiological and psychological benefits of strength training, only 24.7% of American women meet the ACSM recommendations of strength training two or more times per week. Because strength training most frequently occurs in gyms, it is important to consider how the gendered environment of the weight room may influence women's participation in strength training. Drawing on feminist theory, the purpose of the present study was to examine the potential psychosocial predictors of using free weights and specific spaces within the gym. **Methods:** Surveys were sent to a random sample of women who had used a campus recreation center. Participants (n=1,135) completed online questionnaires examining several psychosocial and gym use variables. **Results:** As hypothesized, women who considered free weight use to be a more feminine activity used free weights more frequently than women who considered free weights to be masculine. In addition, women who exhibited thinner ideal physiques used cardio machines with more frequency than those with larger ideal physiques. In terms of gym space, women with lower gender role stress used high male spaces more frequently than women with higher gender role stress. **Conclusions:** Results suggest that not only might some women perceive strength training to be masculine, they may also avoid strength training because it occurs in predominantly masculine spaces. This study begins to shed light on the complex relationship between socially constructed ideologies of gender and bodies and women's individual motivations to strength train.

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Review of Literature

Introduction

Strength training is defined as the strengthening of a muscle or muscle group by exercising it against an external load (ACSM, 2013). The American College of Sports Medicine (ACSM) recommends that healthy adults engage in at least two days per week of strength training; however, only 29.6% of Americans meet this recommendation (CDC, 2013). Furthermore, there is a gender difference among Americans who meet these guidelines. Specifically, in 2013, 34.8% of men engaged in muscle strengthening activities on two or more days a week, compared to only 24.7% of women (CDC, 2013). In college settings, women are less likely than men to meet the ACSM muscle strengthening recommendations, but are more likely to meet aerobic guidelines (Farren et al., 2017). Current research indicates that while both strength training and non-strength training women are aware of the benefits of strength training (Harne & Bixby 2005; Zach & Adiv 2016), non-strength training women also cite a number of barriers that prevent them from adhering to the national guidelines. These barriers include time and effort as well as lack of social support and motivation (Harne & Bixby, 2005; O'Dougherty et al., 2008). According to a number of qualitative studies, women also avoid strength-training activities because they consider them too masculine (Kaskan & Ho, 2016; Brace-Govan, 2004).

Benefits of Strength Training

This low adherence to the ACSM recommendations is particularly important because strength training provides a number of physical and psychological benefits. Regular resistance training reduces the risk of diseases such as osteoporosis, cardiovascular disease, and diabetes (Winett & Carpinelli, 2001; Mosti et al., 2014;

Layne & Nelson, 1999) as well as increasing overall fitness and metabolism (Walberg, 1989). While these physical benefits apply equally across the sexes, women are at a higher risk for osteoporosis than men (Cawthon, 2011). Therefore, the bone-strengthening effects of strength training are particularly important for women. Strength training is also associated with a number of psychological benefits. These include positive mood changes, decreased anxiety and depression, increased self-efficacy and increased psychological functioning (Fox, 1999; Ossip-Klein et al., 1989; Tsutsumi, et al., 1998; Rocheleau et al., 2004; Doyne et al., 1987).

Finally, strength training has been linked to a number of body image factors including improved body satisfaction, body image, and general well being in addition to a decreased incidence of depression and anxiety (Henry, Anshel, & Michael, 2006; Williams & Cash, 2001; Martin Ginis et al., 2014; Lubans, Aguiar, Callister, 2010; Tucker & Maxwell, 1992; O'Connor, Herring, & Caravalho, 2010). These findings are particularly relevant for women, who experience disproportionately high levels of body dysmorphia and body dissatisfaction (MacNeill & Best, 2015; Murnen, 2011; Frederickson & Roberts, 1997). In addition, high levels of body dissatisfaction are associated with maladaptive behaviors such as disordered eating and excessive exercise (MacNeill & Best, 2015; Cash & Smolak, 2011). Unsurprisingly, women are more likely than men to experience eating disorders and associated compulsive behaviors, including exercise dependence (Naylor, Mountford, & Brown, 2011; Cash & Smolak, 2011). Furthermore, women are more likely than men to overestimate their body size, be critical of their physiques, and have higher body dissatisfaction (Hart, Leary, & Rejeski, 1989; Murnen, 2011).

Considering how strength training may benefit individuals who are prone to negative body image and eating disorders, it is important to understand why so few women meet the strength training guidelines. Specifically, researchers must consider sociocultural norms and the ways they influence individual motivations and behaviors. This psychosocial approach will help elucidate how women make specific choices about where they go and what they do in the gym by tying these psychological factors to social constructs of bodies and gender. Research that examines female exercise behavior in its broader social context will play a role in addressing the strength training gender gaps that exist in the gym.

Feminist Theory

This literature review is grounded in feminist theory, which postulates that gender is a construct imposed by society rather than an innate characteristic of an individual. Feminist research does not necessarily involve all-female study populations or even issues that are unique to women, nor is it a function of the political leanings of the researcher. Rather, feminist research is characterized by research questions and methodologies that centralize issues of power and authority and are critical of conventional narratives and assumptions (Harnois, 2013). Within the current research, a feminist lens foregrounds the idea that women's experiences with strength training and the weight room are not just functions of individual psychology. These experiences are also influenced by ideologies of gender, femininity, and bodies that are deeply entrenched within a broader social context. Therefore, a feminist approach to women's exercise behaviors should encompass two specific domains. The first includes the psychological motivations, barriers, and experiences related to strength training among women. The

second domain is how gender and social constructions of the ideal female body play out in the gendered space of the weight room. This literature review will use a feminist approach to synthesize research across domains related to strength training and to the gym.

Feminist Theory and Sport. Much of the feminist theory that grounds this research stems directly from athletics. Sport, which feminist scholars argue is a historically masculine institution, is typically viewed as an illustration of hegemonic masculinity (Messner, 1992; Markula & Pringle, 2006). While masculinity takes a number of different forms in contemporary society, some stigmatized and others marginalized, hegemonic masculinity refers to the dominant group: white, upper to middle class, heterosexual, cisgender men. Sport as an institution is structured around a system that privileges the needs and desires of this dominant group, often to the exclusion of others. As such, sport is a site in which culturally dominant ideas about gender and identity are created, reinforced, and legitimized (Messner, 1992).

Mainstream sports, which enjoy enormous cultural capital in America, both reinforce and reproduce a dominant form of masculinity that subordinates women (Markula & Pringle, 2006). The subordination of women through sport is rooted in the concept of biological essentialism, in which the cultural assumption is that all humans fit into one of two distinct, oppositional, and biologically determined categories: “female” or “male” (Kane, 1995). While this idea is thoroughly critiqued by feminist scholars who argue that gender is a cultural construct and not an innate characteristic, the gender binary still operates as an essential organizing principle in many social institutions. Because sport is associated with power, virility, and domination, the athletic body is seen as

masculine while the female body is considered inherently unathletic (Hall, 1996). Female athletes, therefore, find themselves positioned as intruders in a male dominated world (Bolin & Granskog, 2003). Research shows that female college athletes often feel the need to emphasize their femininity by dressing a particular way or wearing makeup on the field (Krane et al., 2004). This concern with appearance is most keenly observed with regards to the muscular female body. Many female athletes express concern over becoming too muscular (Choi, 2003; Gruber, 2007; Grogan et al., 2004). Non-athlete women echo this concern, as well (Krane et al., 2001). Female recreational weightlifters, for example, adjust their workouts to prevent the development of too much muscle (Dworkin, 2001). Feminist theorists argue that female muscularity must be contained in order to maintain the visible differences between men and women, thereby upholding the gender binary (Choi, 2003; Grogan, 2004).

Feminist Theory and Fitness. Hegemonic masculinity is not confined to athletics, however. Within the world of fitness, the gender binary is reinforced in two key ways. The first method is through culturally reinforced standards of female appearance and beauty. One of the biggest differences between sport and fitness is that sport requires an athlete to mold his or her body in pursuit of athletic performance while fitness is considered "embodied performance," in which the end-goal is not competition but bodily transformation (Sassatelli, 2010). Fitness revolves around the constant cultivation of the body to achieve its ideal form. This, then, begs the question: what is the ideal form? Societal standards for the perfect body are also constantly evolving. In the early 1960s and 70s, women were encouraged to exercise to maintain their slender, but soft female shapes (Markula, 1995). Fitness magazines provided their readers with the proper

techniques to avoid bulk while reassuring them that female hormones were incapable of producing large muscles. In the 1980s, however, things began to change. Jane Fonda introduced the concept of the toned female body. Muscles, as long as they were trim, lean, and limited to specific body parts, suddenly became acceptable, even necessary, to the ideal female shape (Markula, 1995). Even for this new, toned version of the ideal female, however, excess muscularity was still associated with a lack of femininity.

Current societal trends are consistent with the body ideal presented by the aerobics movement: thin, but also firm and toned. However, female muscularity is becoming more popular than it was in the 80s. The CrossFit movement and its emphasis on strong (and strong-looking) women is indicative of the way muscles may empower women (Steinfeldt et al., 2011). Despite increased acceptance and visibility of female muscularity, however, women are still pressured to adhere to sociocultural appearance norms. While a certain amount of muscle is now associated with ideal femininity, it must always be small and contained and not large and bulky. Size and bulk are still associated with masculinity, while smallness is a crucial part of (Western) ideal femininity (Choi 2003; Johansson 1996). In the bodybuilding, muscle-sculpting world of fitness, this visual separation of the genders plays out in very specific ways. Because muscularity is a masculine trait, overly muscular females are considered transgressive and often threatening. For example, while male bodybuilders are perhaps considered extreme or obsessive, their gender is rarely questioned. Female bodybuilders, on the other hand, are frequently referred to as deviants or freaks whose muscular bodies make them look too much like men (McGrath & Chananie-Hill, 2009). This need for women to resist

muscularity due to sociocultural appearance demands is part of the psychosocial backdrop against which women engage with fitness in their daily lives.

The second method in which the gender binary is enforced in fitness culture is through the gendered construction of space. A key assumption of feminist research is that everyday spaces are largely coded and determined by overlapping hierarchies of race, gender, class, and age (Harnois, 2013). In the context of this research, the cultural space in which most strength training occurs is the gym. Gyms are historically masculine spaces, stretching from the ancient Greek *gymnasium* to the mid twentieth century bodybuilding gyms that were devoted exclusively to weight lifting – and exclusively to men (Sassatelli, 2010). While contemporary gyms have morphed into multifaceted fitness facilities that market to and are welcoming of women, the weight room has remained a masculine space. In fact, feminist scholars argue that there is a close relationship between hegemonic masculinity and weights (Johansson, 1996). Most traditional gyms still exhibit this level of gender separation. Women occupy spaces associated with group fitness, aerobics, and cardiovascular training while men inhabit the weight room (Johansson, 1996; Dworkin, 2003; Craig and Liberti, 2007; Salvatore and Maracek, 2010). The cultural associations between weights and masculinity and cardio machines and femininity further ground women's experience with fitness in a thoroughly gendered environment. By approaching this research from a feminist perspective, it becomes possible to connect social assumptions regarding gender to women's individual decisions to engage in or avoid particular types of activity.

Women, Body Image, and Exercise Behavior

The link between sociocultural ideals and individual behaviors is particularly clear when considering the relationship between exercise and body image. First, appearance is one of the top three motivators for college-aged women to engage in physical activity, unlike men who are typically motivated by more intrinsic factors such as enjoyment and the challenge of physical activity (Egli et al., 2011; Kilpatrick et al. 2005; Lyons, Kaufman, & Rima, 2015; Lamarche & Gammage, 2012). Despite research indicating that extrinsic motivations are significantly less likely to lead to exercise adherence than intrinsic motivations (Buckworth et al., 2007; Deci, Koestner, & Ryan, 1999), women still cite the desire to maintain or change a particular body shape and appearance as one of the top reasons to engage in physical activity.

Considering that many women exercise for appearance reasons, it is important to examine appearance investment and body image as psychological variables. While exercise has been shown to have a small positive effect on body image in women, that effect can be negated when exercise is undertaken for appearance-based reasons and when it takes place in environments that promote appearance-based comparisons (Campbell & Hausenblas, 2009; Hausenblas & Fallon, 2006; Prichard & Tiggemann, 2012). The majority of research investigating the link between exercise behavior and body image focuses on social physique anxiety (SPA). SPA is defined as the anxious feelings that arise when an individual believes that his or her physique is being negatively evaluated by others (Hart, Leary, & Rejeski, 1989). Unsurprisingly, women have higher SPA than men (Hart, Leary, & Rejeski, 1989). While research indicates that high SPA is negatively associated with exercise adherence, effect sizes are small to moderate with inconclusive evidence as to what factors (such as age or gender) moderate this

relationship. This is possibly due to the fact that while evaluation concerns may deter a woman from exercising, she may also be motivated to do so in order to improve her appearance (Hausenblas, Brewer, & van Raalte, 2004). Research also indicates that the exercise environment has a significant effect on SPA levels during exercise. For example, the presence of mirrors – found in most fitness facilities – is associated with increased SPA, as are settings in which physique is emphasized (Martin Ginis, Jung, & Gauvin, 2003; Crawford & Eklund, 1994; Focht & Hausenblas, 2004). Furthermore, in sedentary women with high SPA, exercising in public and mirrored environments is associated with decreased affect (Martin Ginis, Jung, & Gauvin, 2003; Focht & Hausenblas, 2006). Finally, women feel more anxious about their physiques in exercise settings where men are present, while the gender composition of exercisers appears to have little effect on men (Kruisselbrink et al., 2004). This finding is particularly relevant considering the gendered use patterns in fitness facilities.

Research suggests that SPA is closely linked to an individual's relationship to ideal body type. The further an individual feels her body is from the ideal, the more likely she is to have high SPA (Woodman & Steer, 2011; Sabiston et al., 2005; Russell & Cox, 2003). While research is consistent regarding the link between SPA and ideal physique, measures of the variable itself are inconsistent. These range from body discrepancies, body surveillance, and figure rating scales (Woodman & Steer, 2011; Fitzsimmons-Craft et al., 2012; Sabiston et al., 2005). Scholars agree that ideal physique is socially constructed by the proliferation of media images that depict thin, often sexualized women (Frederickson & Roberts, 1997; Abood & Chandler, 1997; Fitzsimmons-Craft et al., 2012; Sabiston et al., 2005). However, measures of body discrepancies and body

surveillance only examine how individuals compare themselves to an external ideal. The figure rating scale is unique in its ability to measure what the ideal physique actually looks like (Sabiston et al., 2005). This scale allows researchers to examine how an individual's exercise behaviors may be influenced by her ideal body type.

While there is no known research that examines the relationship between ideal physique and strength training, women often cite fear of excess bulk or size as a barrier to strength training (Salvatore & Marecek 2010; Kaskan & Ho 2016; O'Dougherty et al. 2008; Dworkin 2003). The ideal female body presented by Western culture is small, thin, and toned. It is possible, therefore, that avoidance of strength training may be related to fear of developing a body that is too large, when compared to the ideal. It is important for future research to include measures of ideal physique and frequency of strength training in order to determine if low levels of strength training are related to sociocultural expectations of the ideal female body.

Gender in the Gym

Just as there are associations between cultural constructions of the ideal female body and negative body image in women, there are also links between cultural constructions of gender and the spaces in which women exercise. While there is a lack of quantitative research examining women's use of weight rooms or fitness facilities, a number of qualitative studies have examined gym culture and gender. Ethnographic observation reveals a clear use pattern, in which women typically confine themselves to aerobics rooms or cardiovascular machines, while men are seen much more frequently in weight rooms (Dworkin 2001, 2003; Heywood 1998). These weight rooms are designated masculine not only by the overwhelming presence of men within them, but also due to

several other markers associated with masculinity. These include the aggressive grunting noises that accompany maximal effort, the association between free weights and maleness, and the hyper-awareness of male versus female dress codes (Dworkin 2003; Brace-Govan 2004). These associations, which have been observed by researchers and explicitly stated by interviewees, provide a clear illustration of the ways in which the weight room is a masculine space that can often feel hostile to women.

While there is no known quantitative measure that examines the degree to which women consider the weight room masculine, sociologists have been measuring the gender type of sport for decades. According to Metheny's (1965) theory of sport and gender, individuals classify sports as either sex-appropriate or sex-inappropriate for women. While the landscape of women's sport participation has shifted drastically since 1965, researchers have shown that Metheny's theory still holds true (Koivula, 2001; Hardin & Greer, 2009; Kaskan & Ho, 2016; Plaza et al., 2016). Aggressive sports and those that involve contact, force, or heavy objects, such as football and weightlifting, are considered masculine. Sports that require grace and aesthetics, like gymnastics and figure skating, are considering feminine. (Metheny, 1965; Koivula, 2001; Hardin & Greer, 2009; Kaskan & Ho, 2016; Plaza et al., 2016). A recent study showed that women who engaged in a masculine-typed activity tended to rate certain masculine activities as less masculine than those who did not (Plaza et al., 2016). This preliminary research indicates that individuals who participate in activities that are culturally associated with masculinity may be less inclined to label such activities as masculine.

There is only one known study that has examined perceived gender appropriateness in a gym context. Salvatore and Marecek (2010) asked female students at

an East Coast University to rate how characteristic it was for men and women to use both the bench press and the Stairmaster. Participants rated the bench press as much more characteristic of men than of women, while the Stairmaster was rated as significantly more characteristic of women. The participants also reported using the Stairmaster more than the bench press. In addition, participants responded to questions designed to measure evaluation concern. This term refers to an individual's interest in how he or she is perceived by others (Liu & Lowe, 2016). Fear of negative evaluation (FNE) is multi-dimensional and includes fear and distress in social situations, avoidance of social interactions, and fear of being negatively evaluated by others (Liu & Lowe, 2016). Research consistently shows that women demonstrate higher levels of FNE than men (Rudolf & Conley, 2005; Pila et al., 2016; Myers & Crowther, 2009). Salvatore and Marecek (2010) reported that participants experienced greater evaluation concerns when they imagined themselves being observed on the bench press than on the Stairmaster. This result did not significantly differ based on the gender of the hypothetical observer. This study suggests a relationship between women's gender typing of strength training activities, their FNE while engaging in those activities, and their actual engagement with strength training (Salvatore & Marecek, 2010).

Along with evaluation concerns, another measure is frequently used in research to investigate how women react to gendered environments. Gender role stress (GRS) refers to a form of emotional distress that occurs as a response to a situation in which an individual feels she is violating traditional gender role norms (Efthim, Kenny, & Mahalik, 2001). Research has shown that emotions such as shame, guilt, and externalization may be linked to feelings of GRS in women. In addition, shame and guilt

lead to behavioral adaptations designed to minimize or avoid stress (Efthim, Kenny, & Mahalik, 2001). Only one known study has investigated GRS in the physical activity domain. Readdy, Watkins, and Cardinal (2011) explored the relationships between GRS, sociocultural appearance demands, and muscle dysmorphia in college men and women. They found that both GRS and appearance demands were strongly correlated with both men and women's desire to achieve a sufficiently muscular body. This result appears at odds with research indicating that women avoid excess muscularity. However, women reported significantly more aerobic training sessions while men reported far more weight training sessions. This suggests that ideal muscularity for women is achieved through cardiovascular exercise, which creates a small, toned figure, instead of weight training, which is perceived as creating a large, bulky one (Readdy, Watkins, & Cardinal, 2011). The current study will examine the relationship between a participant's level of GRS and the degree to which she considers strength training a masculine or feminine activity. GRS will also be tested as a possible predictor of an individual's strength training frequency during a seven-day week.

Overall, research on SPA, negative evaluation, the strength training habits of women, and GRS indicates that when compared to men, women are less likely to strength train, are more prone to anxiety about their appearance, are more likely to avoid exercise in public settings due to SPA, and spend less time in male dominated exercise spaces (CDC, 2013; Hart, Leary, & Rejeski, 1989; Martin Ginis, Jung, & Gauvin, 2003; Focht & Hausenblas, 2006; Kruisselbrink et al., 2004). There is only one known group of studies that combines these factors to investigate why there are so few women who strength train or spend time in the weight room. Salvatore and Marecek (2010) conducted four studies

to explore the complex relationship between the gym and physical activity-based cultural assumptions, evaluation concerns, and the experiences of men and women in fitness center environments. The results of the four studies were published within one article (Salvatore & Marecek, 2010). Study 1 was a content analysis of two Google search terms, conducted each year between 2007 and 2010. The terms were "burn fat" and "build muscle." The purpose of the study was to analyze whether one gender was overrepresented in the depiction in each of the two fitness goals. In 2010, 75% of the images associated with "build muscle" depicted solely men versus 22% for women, while the proportion of images that contained solely women in the "burn fat" category was 38% compared to just 7% for men. These ratios indicate that there is a strong cultural link between specific exercise goals and gender (Salvatore & Marecek, 2010).

Study 2 explored evaluation concerns and gender typing in a sample of 56 female college students. Results indicated that both FNE and gender typing may be negatively associated with engagement in strength training for women (Salvatore & Marecek, 2010). Study 3 measured the use of equipment and general level of comfort in a college fitness center for both college-aged men and women. Sixty-one men and women from the same university as Study 2 were surveyed. Results showed that while equivalent proportions of men and women used the fitness center, women rated themselves as less comfortable within the facility than men. In addition, women reported less use of free weights and resistance machines when compared to their male peers. There were no gender differences on the use of aerobic equipment. Finally, Study 4 analyzed reports written by the surveyed students describing any experiences in the fitness center that had caused them discomfort. More women than men reported such incidents and women were more

likely than men to experience discomfort due to feeling or being scrutinized by others, whether based on weight/appearance or on lack of confidence/skill (Salvatore & Marecek, 2010). Overall, these four studies indicate that women's exercise behavior in fitness centers may be directly related to both the gender dynamics within those spaces and sociocultural assumptions regarding strength training, masculinity, and femininity.

Limitations

The current literature on gender, strength training, and the gym has a number of limitations. First, only the Salvatore and Marecek study (2010) used a multi-dimensional approach to explore both psychological and sociocultural variables related to women and the weight room. While this study laid important groundwork for future research, it had several limitations including non-validated measures, small convenience samples, and hypothetical scenarios instead of randomized clinical trials. The small sample size and the lack of rigorous experimental methods lead to results that were not generalizable to a larger population. In addition, the authors chose to publish all four studies in one article, which resulted in research that spanned a number of topics without establishing sufficient depth in any of them.

While there is a large amount of research investigating the link between sociocultural ideals, body image and exercise, very few studies have focusd on the role of exercise type in this relationship. Research indicates that negative body image is related to the cultural ideal of the thin, female body. It is important, therefore, to understand how engagement with strength training may be related to an individual's investment in having a thin body. In addition, while studies show that female exercise behavior is greatly

motivated and affected by appearance goals, there has been no research on exercise behavior and what the ideal female figure actually looks like.

Finally, while many ethnographic studies have explored the gendered culture of the weight room, very little quantitative research has examined the relationship between gender, culture, and exercise behavior in weight rooms. Even though gym membership is at an all-time high (IHRSA, 2016), there is little research on why women continue to have low adherence to the strength training guidelines. Although gym environments are highly gendered spaces, there is almost no research on GRS and how it may affect women's desire to engage in strength training or be in spaces where strength training takes place. Overall, the current research does not link cultural constructs such as ideal femininity and gendered space to psychological measures such as SPA and evaluation concern.

Summary

By synthesizing research across a number of domains, it is possible to identify the ways in which appearance goals and gendered spaces may contribute to women's avoidance of strength training. Women are more likely than men to have appearance as a motivator for physical activity (Egli et al., 2011; Kilpatrick et al. 2005; Lyons, Kaufman, & Rima, 2015; Lamarche & Gammage, 2012). Women are also more likely than men to fear becoming bulky, and this can be a barrier to strength training (Salvatore & Marecek 2010; Kaskan & Ho 2016; O'Dougherty et al. 2008; Dworkin 2003). Women are more likely than men to experience SPA, which is increased during exercise that takes place in public settings, especially if those settings are predominantly male (Martin Ginis, Jung, & Gauvin, 2003; Focht & Hausenblas, 2006; Kruisselbrink et al., 2004). Weight rooms are

culturally associated with masculinity, both because of the prevalence of men in those spaces and because of the actions that take place there, including loud grunts and noises (Dworkin 2003; Brace-Govan 2004). In addition, early research on women and the weight room suggests that women associate free weights with masculinity and that women feel less comfortable than men in the gym (Salvatore & Marecek, 2010). Despite well-documented benefits and a rapidly growing fitness industry, women still engage in less strength training than men. It is crucial to understand the motivations and cultural patterns that may contribute to strength training barriers so that women do not get left behind as the fitness industry continues to grow.

Purpose and Hypotheses

Study Rationale

This study will address the following gaps in the literature regarding the relationships between exercise behavior, gender norms, and body image among women.

1. There are very few quantitative studies that examine how gender, culture, and exercise behavior impact women's experiences in the weight room.
2. Few studies explore both the psychological antecedents of exercise behavior (e.g., SPA, FNE, and appearance-based RE) in conjunction with broader social constructs that may also drive behaviors (e.g., the gendered space of the weight room, GRS and the thin ideal female physique).
3. The one study that does address both psychological and sociocultural variables used small convenience samples and a number of non-validated measures (Salvatore & Marecek, 2010).

4. While several studies have examined associations between body image and exercise, few studies have addressed the role of exercise type in this relationship (Martin Ginis, Jung, & Gauvin, 2003; Focht & Hausenblas, 2006; Kruisselbrink et al., 2004).

The purpose of this study was to examine factors associated with women's low use of weight rooms by conducting an online survey among female users at a university fitness center. Participants responded to questions about their use patterns in the fitness center. The survey also measured several psychological variables related to exercise behavior (SPA, GRS, FNE, appearance-based RE) and two sociocultural variables measuring their relationship to cultural ideals (ideal physique, gender appropriateness of gym activities).

Specific Aims and Hypotheses

Specific Aim 1. To examine if perceived gender appropriateness of using free weights, ideal physique, and appearance-based reasons for exercise are associated with participants' use of free weights.

Related hypothesis. Rating free weights as a neutral or feminine activity, having a larger ideal physique, and having lower appearance-based RE will be associated with higher free weight use.

Specific Aim 2. To examine if perceived gender appropriateness of using free weights, ideal physique, and appearance-based reasons for exercise are associated with participants' use of cardio machines.

Related hypothesis. Rating free weights as a masculine activity, having a thinner ideal physique, and having higher appearance-based RE will be associated with higher cardio machine use.

Specific Aim 3. To examine if gender role stress (GRS), fear of negative evaluation (FNE), and social physique anxiety (SPA) are associated with participants' use of female dominated spaces in the gym.

Related hypothesis. Higher trait levels of GRS, FNE, and SPA will be associated with higher use of female dominated gym spaces.

Specific Aim 4. To examine if GRS, FNE, and SPA are associated with participants' use of male dominated spaces in the gym.

Related hypothesis. Lower trait levels of GRS, FNE, and SPA will be associated with higher use of male-dominated gym spaces.

Method

Participants

Potential participants were recruited via emails sent to students, staff, and faculty who used a Midwest recreation center located at a large university. This recreation center houses several fitness centers, climbing walls, squash and racquetball courts, gymnasiums, a cycling studio, and a number of multi-purpose rooms. Individuals who are affiliated with the university are eligible for a membership. Membership is free for most students and costs $185 per semester for faculty and staff. Email addresses were obtained from all female students who had used the recreation center between September 6, 2016 and October 31, 2016. Potential participants (n=4,000) were sent an email with a brief description of the research and a link to a survey. A total of 1,235 (31%) surveys were received and 1,188 (96%) of surveys received were deemed complete. Women currently working with a personal trainer (n = 53) were excluded from the study given this could influence the participants' decision to use the weight room. This resulted in a final

sample size of 1,135 women. Participant ages ranged from 17 to 66 years, with a mean age of 23.4 years. Once all complete surveys were collected, one participant was drawn at random and awarded a $50 gift certificate to the recreation center cafe as compensation. The Institutional Review Board at the University of Minnesota granted approval for this study.

Measures

Participants completed several questionnaires related to the type of exercise equipment used, spaces typically occupied in the gym, the gender appropriateness of specific gym activities, reasons for exercise (RE), ideal physique, fear of negative evaluation (FNE), social physique anxiety (SPA), and gender role stress (GRS).

Demographics. Participants completed several demographic questions including racial and ethnic group, date of birth, frequency of exercising alone, and experience working with a personal trainer. Participants were also asked if they would be willing to be contacted for future research.

Equipment Use. Participants completed a questionnaire designed to assess which type of equipment they typically used in the recreation center and how frequently they used it. Equipment type was divided into the following four categories: (1) Cardio machines; (2) functional training equipment; (3) resistance machine; and (4) free weights. Participants indicated how many times in the past seven days they had used each of the four categories of equipment. This questionnaire was adapted from a questionnaire used in a previous study examining frequency of gym equipment use (Salvatore & Marecek, 2010).

Gym Space Use. Participants also responded to a similarly worded questionnaire to assess which spaces they used most frequently in the recreation center. The seven spaces were described as follows: (1) Downstairs weight room; (2) upper fitness center; (3) lower fitness center; (4) first tier resistance machines; (5) second tier elliptical trainers and treadmills; (6) third tier free weights and TRX training zone; and (7) top tier resistance machines. There was also an "other" category, as the recreation center is a very large space. Participants indicated how many times in the past week they had used which of the spaces in the recreation center. Once all survey responses were collected, observations were conducted within the seven above spaces in order to establish an average percentage of women in each space. These observations are described in more detail in the procedures section.

Gender Appropriateness of Gym Activities. Participants completed a questionnaire designed to measure the perceived gender appropriateness of using the same four types of gym equipment from the Gym Equipment Use questionnaire (cardio machines, functional training equipment, resistance machines, and free weights). This questionnaire was adapted from the gender-appropriateness scale that measures perceived gender characteristics of sports (Metheny, 1965; Koivula, 2001; Hardin & Greer, 2009). The adapted version used the same language and five-point Likert scale as the original (one being feminine, three being neutral, and five being masculine). However, instead of participants rating a list of sports, they rated the use of equipment found in most gyms.

Reasons for Exercise Inventory Scale. Motives to engage in exercise were measured using the 16-item Reasons for Exercise Inventory (REI: Silberstein et al., 1988). The original scale contained seven subscales measuring weight control, physical

attractiveness, health, fitness, enjoyment, mood, and body tone. Previous researchers have simplified the scale by reducing it to three domains: Appearance-related (weight control, body tone, attractiveness), health/fitness, and enjoyment/mood improvement (Prichard & Tiggeman, 2005, 2008; Strelan, Mehaffey, & Tiggemann, 2003). Only the appearance-related (nine items) and health/fitness-related (seven items) motives for exercise were assessed in the current study, which is consistent with other research on exercise motives and body image (O'Hara, Cox, & Amorose, 2014). Participants indicated the extent to which each of the 16 items was an important reason for exercising, ranging from one (not at all important) to seven (extremely important). In previous research, internal reliabilities (Cronbach's alpha) were acceptable (Prichard & Tiggeman, 2005). The REI demonstrated good internal consistency in the current study, with a Cronbach's alpha of .83. Each subscale also exhibited good reliability, with Cronbach's alphas for the appearance subscale at .88 and health subscale at .79.

Photographic Figure Rating Scale. Body image was assessed using two different measures. The first was the Photographic Figure Rating Scale, which consists of ten front-view photographic images of real women who represent each previously established body mass index (BMI) category (PFRS; Swami et al., 2008). Each of the figures has her face obscured and is wearing the same neutral outfit so as not to detract attention from her body size. This scale was developed to address limitations with the Contour Drawing Figure Rating Scale (CDFRS; Thompson & Gray, 1995). Previous researchers have identified a number of problems with the figural scales, including lack of ecological validity, minimal assessment of reliability, visible facial features that distract attention from body size, and a relatively small number of figures (Gardner &

Brown, 2010; Gardner, 2001; Thompson & Grey, 1995; Swami et al., 2008). Subsequent research has indicated that ratings on the PFRS have good test-retest reliability (all *r*s > .87) and good convergent validity in relation to BMI. In addition, body dissatisfaction scores that are derived from the PFRS are significantly correlated with a variety of body image variables, including body appreciation, internalization of media messages of appearance, and self-reported BMI (Swami et al., 2012). Cronbach's alphas in the current investigation indicated acceptable reliability at .75. Participants were scored based on the figure they rated most attractive, with lower numbers indicating thinner figures.

Social Physique Anxiety. Body image was also assessed using the Social Physique Anxiety Scale (SPA-S; Martin et al., 1997). This is a nine-item scale used to measure participants' trait level of anxiety regarding others evaluations' of their physiques. Participants chose how much each statement was characteristic of them on a five-point Likert scale from one (Not at all characteristic) to five (Extremely characteristic). Items five and eight were reverse scored and all items were summed to create an overall score ranging from nine to 45. Previous research indicates that the SPA-S has satisfactory internal consistency as well as good validity and adequate reliability (Focht & Hausenblas, 2004; Hausenblas & Martin, 2000). The internal consistency of the SPA-S in the current study was .88.

Fear of Negative Evaluation. Evaluation concerns were measured using a version of the Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983). The original scale comprised of eight items and four reverse-worded items. In an effort to increase the stability and clarity of the scale, previous researchers have dropped the four reverse-worded items and used only the eight-item scale (BFNE-S; Rodebaugh et al,

2004). BFNE-S scores have demonstrated high internal consistency reliability (α = .96) in clinical samples and have been validated by previous researchers (Carleton et al., 2007; Carleton et al., 2011; Rodebaugh et al., 2004; Weeks et al. 2005). Research indicates that the BFNE-S better predicts anxiety in clinical populations than other versions of the scale (Carleton et al., 2011). Finally, Liu and Lowe (2016) validated the BFNE-S among a non-clinical population of U.S. college students, with an internal consistency reliability of .97. The BFNE in the present study exhibited excellent internal reliability, with Cronbach's alpha at .94.

Gender Role Stress. Participants also completed a questionnaire designed to assess female gender role stress (GRS). The Female Gender Role Stress Scale (FGRS: Gillespie & Eisler, 1992) is a 39-item measure with five different subscales. Participants rated the items on how stressful each given scenario would be on a Likert scale ranging from zero (not at all stressful) to five (extremely stressful). These scenarios ranged from "finding that you've gained 10 pounds" to "having to deal with unwanted sexual advances." Test-retest reliability (r = .82) indicates the scale's ability to measure trait characteristics. In addition, the items significantly differentiate between male and female gender role stressors (Gillespie & Eisler, 1992). Prior research shows that the psychometric properties of the FGRS are acceptable, with Cronbach's alphas ranging from .73 to .83 (Readdy, Cardinal & Watkins, 2011; Martz, Handley, & Eisler, 1995). The reliability coefficient in the current investigation was .92.

Gender Composition of Gym Space. The gender compositions of the seven recreation center spaces in this study were determined through observation. Observations were recorded on six different occasions, at different times, and on different days of the

week. During each observation, the number of men and women in each of the following spaces was recorded: (1) Downstairs weight room; (2) upper fitness center; (3) lower fitness center; (4) first tier resistance machines; (5) second tier ellipticals and treadmills; (6) third tier free weights and TRX training zone; and (7) top tier resistance machines. Each observation lasted between one to three minutes and was complete when each person in the room had been counted. If a new person entered the space within that time frame, he or she was also counted. Results were reported based on the percentage of men in each space.

Procedures

Email addresses were obtained from females who used the recreation center between September 6, 2016 and October 31, 2016. The list included 9,572 women. A random sample of 4,000 of the 9,572 obtained addresses was sent an email with a brief introduction to the study and an external link. The link took participants to a consent page. Respondents could only begin the survey questionnaires once they had given online consent to participate in the study. The survey contained seven different questionnaires and took approximately 15 minutes to complete. The survey was available to potential participants for one month after the emails were sent. Once the survey was closed, observations were conducted to determine the gender composition of each of the seven gym spaces.

Data Analysis

Data collection was completed in November 2016 and analyzed using SPSS. Pearson's correlations were conducted in order to examine the relationships between gym use and the psychosocial variables assessed in the survey. Four separate hierarchical

multiple regression analyses were performed to test the following relationships: ideal physique, gender appropriateness of free weights, and appearance-based RE predicting free weight use; (2) ideal physique, gender appropriateness of free weights, and appearance-based RE predicting cardio use; (3) GRS, FNE, and SPA predicting the use of less masculine space; and (4) GRS, FNE, and SPA predicting the use of more masculine space. Spaces were characterized as feminine or masculine based on observations of the recreation center that determined the average percentages of men and women within each of the seven fitness spaces referenced in the study.

Results

Demographics

The final sample (n = 1,135) included predominantly Caucasian young women (80.8%; *M* = 23.4; *SD* = 7.5) who used the recreation center at a large Midwestern university. Table 1 summarizes participant characteristics.

Table 1

Demographics

Demographics	Total sample (n=1135)	Percentage
Age (average in years)	23.4	SD = 7.47
Race		
White	917	80.8%
African American	27	2.4%
Asian	132	11.6%
Other	59	5.2%
Ethnicity		
Hispanic/Latino	36	3.2%
Not Hispanic/Latino	1096	96.6%
Worked with Trainer		
No	830	73.1%
Yes	305	26.9%
Exercise Alone		
Always	217	19.1%

Very Frequently	464	40.9%
Occasionally	297	26.2%
Rarely	75	6.6%
Very Rarely	67	5.9%
Never	14	1.2%

The racial/ethnic make-up of this sample was slightly different from the participating university's demographics, with more representation from Caucasians (80.8% in current sample versus 64.4% of university students). A majority of participants (60%) reported working out alone always or very frequently. Twenty-seven percent had worked with a personal trainer in the past.

Gym Use

The observed gender composition of each gym space is summarized in Table 2. On average, there were higher percentages of men than women in each space. Spaces with the highest percentages of men were classified as high male, while spaces with lower percentages of men were classified as low male.

Table 2

Gender Composition of Gym Space

Gym Space	n	Average % of Men	Category
Downstairs Weight Room	19	93.26	High Male
Lower Fitness Center	24	86.34	High Male
First Tier Resistance Machines	19	84.52	High Male
Top Tier Resistance Machines	7	80.42	High Male
Second Tier Treadmills	6	59.90	Low Male
Upper Fitness Center	12	57.88	Low Male
Third Tier Free Weights	13	55.24	Low Male

Table 3 summarizes descriptive statistics on equipment use and gym space use. Participants reported using cardio machines with the highest frequency followed by free

weights. In terms of space use, participants used feminine spaces with the highest frequency.

Table 3

Equipment and Space Use Descriptives

Variable	Mean	SD
Equipment Use Frequency		
Days per Week using Cardio Equipment	2.08	1.92
Days per Week using Free Weights	1.36	1.72
Days per Week using Resistance Machines	0.99	1.52
Days per Week using Functional Equipment	0.60	1.19
Space Use Frequency		
Days per Week in High Male Spaces	1.36	1.82
Days per Week in Low Male Spaces	1.80	1.95
Days per Week in "Other" Spaces	0.53	1.29

Psychosocial Variables

Table 4 summarizes the descriptive information about the psychosocial variables measured in this study.

Table 4

Psychosocial Variables Descriptives

Variable	Mean	SD
Gender Appropriateness of Equipment		
Gender Appropriateness of Cardio Equipment	2.37	0.80
Gender Appropriateness of Functional Equipment	3.20	0.69
Gender Appropriateness of Resistance Machines	3.20	0.74
Gender Appropriateness of Free Weights	3.67	0.83
Social Physique Anxiety	26.6	7.88
Reasons for Exercise - Appearance	41.9	10.7
Fear of Negative Evaluation	15.0	8.30
Gender Role Stress	162	27.5
Ideal Physique	3.79	0.94

In general, participants rated cardio equipment as the most female appropriate of the four gym activities and free weights were considered the most male appropriate. The mean response for appearance-based reasons for exercise (RE) was above the mid-point of the scale. Participants reported moderately high levels of social physique anxiety (SPA), fear of negative evaluation (FNE), and gender role stress (GRS). The mean ideal physique of the participants was 3.6 out of the possible 10, which is considered quite thin on this scale. Table 5 illustrates the bivariate correlations between the study variables.

Table 5

Correlation Matrix for Equipment Use and Psychosocial Variables

Variable	1	2	3	4	5	6	7	8
1. Free Weight Use	-							
2. HM Space Use	.56*	-						
3. Free Weight App.	-.12*	-.02	-					
4. SPA	-.00	.05	.17*	-				
5. RE -Appearance	.09*	.11*	.11*	.49*	-			
6. FNE	-.04	.02	.13*	.63*	.36*	-		
7. GRS	-.07	-.06	.05	.33*	.22*	.40*	-	
8. Ideal Physique	-.05	-.03	.01	-.16*	-.25*	-.17*	-.06	-

Notes. *$p \leq .05$. HM = High Male. App. = Gender Appropriateness. SPA = Social Physique Anxiety. RE = Reasons for Exercise. FNE = Fear of Negative Evaluation. GRS = Gender Role Stress.

Notably, SPA, appearance-based RE, and FNE were significantly correlated. GRS was also significantly related to appearance-based RE, SPA, and FNE. Both the perceived gender appropriateness of free weights and ideal physique were significantly correlated with appearance-based RE, SPA, and FNE. Higher free weight use was related to higher use of high male spaces in the gym and higher perceived masculine appropriateness of using free weights.

Aim 1: Free Weight Use

A hierarchical multiple regression analysis tested if ideal physique, perceived gender appropriateness, and appearance-based RE were associated with participants' free weight use (see Table 6). Higher appearance-based RE and more feminine perceived gender appropriateness of using free weights were significantly associated with higher frequency of free weight use. Ideal physique was not significantly associated with free weight use.

Table 6

Psychosocial Associations with Free Weight Use

Variable	Beta	SE	95% CI
Ideal Physique	-0.03	0.06	(-0.18; 0.07)
Appearance Reasons for Exercise	0.09	0.01	(0.00; 0.03)
Gender Appropriateness of Free Weights	-0.12	0.07	(-0.41; -0.14)

Notes. SE = Standard Error. CI = Confidence Interval.

Aim 2: Cardio Machine Use

A separate hierarchical multiple regression analysis tested if ideal physique, perceived gender appropriateness of free weights, and appearance-based RE were associated with participants' frequency of cardio equipment use (see Table 7). Higher appearance-based RE and thinner ideal physique were associated with higher frequency of cardio equipment use. Gender appropriateness of free weights was not significantly associated with cardio equipment use.

Table 7

Psychosocial Associations with Cardio Machine Use

Variable	Beta	SE	95% CI
Ideal Physique	-0.16	0.07	(-0.30; -0.03)
Appearance Reasons for Exercise	0.03	0.01	(0.01; 0.04)
Gender Appropriateness of Free Weights	-0.08	0.08	(-0.22; 0.07)

Notes. SE = Standard Error. CI = Confidence Interval.

Aim 3: Low Male Space Use

An additional hierarchical multiple regression tested whether GRS, FNE and SPA were associated with the frequency of using low male spaces in the gym (see Table 8). Higher SPA was related to higher frequency of using low male spaces in the gym. GRS and FNE were not significantly related to using low male spaces in the gym.

Table 8

Psychosocial Associations with Low Male Space Use

Variable	Beta	SE	95% CI
Social Physique Anxiety	0.04	0.01	(0.01; 0.06)
Gender Role Stress	-0.00	0.00	(-0.01; 0.00)
Fear of Negative Evaluation	-0.01	0.01	(-0.03; 0.02)

Notes. SE = Standard Error. CI = Confidence Interval.

Aim 4. High Male Space Use

A final hierarchical regression analysis was performed to test whether GRS, FNE and SPA were associated with the frequency of using high male spaces in the gym (see Table 9). In this model, lower GRS was associated with a higher frequency of using high male spaces. SPA and FNE were not significantly related to using high male spaces.

Table 9

Psychosocial Associations with High Male Space Use

Variable	Beta	SE	95% CI
Social Physique Anxiety	0.07	0.01	(-0.00; 0.04)
Gender Role Stress	-.084	0.00	(-0.01; -0.00)
Fear of Negative Evaluation	0.03	0.01	(-0.01; 0.03)

Notes. SE = Standard Error. CI = Confidence Interval.

Discussion

The purpose of this study was to address the gender imbalances in strength training and weight room use. This was accomplished by exploring the relationships

between psychological variables and sociocultural gender norms. First, ideal physique, gender appropriateness of using free weights, and appearance-based reasons for exercise (RE) were tested for possible associations with free weight use in the gym. Second, the same independent variables were tested for possible associations with cardio machine use in the gym. Third, gender role stress (GRS), fear of negative evaluation (FNE), and social physique anxiety (SPA) were tested for possible associations with the use of low male spaces in the gym. Fourth, the same independent variables were tested for possible associations with the use of high male spaces in the gym. The results partially supported the hypotheses, which were based on feminist theory and previous research on women, body image, and exercise behaviors.

Gym Use, Psychosocial Variables, and Correlations

Of the four possible types of equipment in this study (cardio machines, functional equipment, free weights, and resistance machines), participants reported using cardio machines with the highest frequency. This is consistent with ethnographic research on women in gyms, which identifies cardiovascular spaces as those most frequently populated by women (Johansson, 1996; Dworkin, 2003; Craig and Liberti, 2007). Consistent with research on women and body image, this sample had moderately high levels of SPA and FNE. Previous research indicates that women are particularly susceptible to negative body image (Hart, Leary, & Rejeski, 1989; MacNeill & Best, 2015; Murnen, 2011; Frederickson & Roberts, 1997; Murnen, 2011) and experience higher levels of evaluation concern than men (Rudolf & Conley, 2005; Pila et al., 2016; Myers & Crowther, 2009). Women in this sample also reported moderately high levels of female GRS. Research indicates that female GRS is closely associated with guilt and

shame, two maladaptive feeling states that have also been linked to SPA and FNE (Readdy, Watkins, & Cardinal, 2011; Efthim, Kenny, & Mahalik, 2001; Woodman & Steer, 2011).

Based on the Ideal Physique measure, the average most attractive figure for this sample was between the third and fourth thinnest of the ten figures shown. This indicates that participants likely desire thin bodies. Not only is this consistent with ideal physique research, it also supports research done by feminist scholars and sociologists about thinness and ideal femininity (Woodman & Steer, 2011; Fitzsimmons-Craft et al., 2012; Sabiston et al., 2005; Choi 2003; Johansson 1996). Scholars argue that women's desire to be thin and small is a direct result of Western culture and media, which has turned the objectification and sexualization of women into an art form (Frederickson & Roberts, 1997; Abood & Chandler, 1997; Fitzsimmons-Craft et al., 2012; Sabiston et al., 2005). Over the last decade, fitness has become rapidly commercialized and commodified in America (Andreasson & Johansson, 2013; Sassatelli, 2010; Markula & Pringle, 2006). As a result, images of ideal female fitness (e.g., thin but toned, muscular but not bulky, heterosexual, and cisgender) are widely circulated. It is important for future research to consider a possible link between portrayals of fit women in the media and the thin ideal physiques of women who use the gym.

Consistent with previous research on body image, the current sample exhibited significant positive correlations between SPA, appearance-based RE, and FNE. (Focht & Hausenblass, 2004, 2006; Hausenblas, Brewer, & van Raalte, 2004; Hart, Leary, & Rejeski, 1989). Ideal physique was negatively associated with the above variables, suggesting that, for women in this sample, a low body image may be the result of wanting

to be thin. GRS was also significantly correlated with SPA, appearance-based RE, and FNE. Considering that past research has established a relationship between sociocultural influences and female GRS, these correlations indicate a possible link between psychological body image variables and sociocultural understandings of gender roles (Readdy, Watkins, & Cardinal, 2011). Finally, the gender appropriateness of free weight use was negatively correlated with all of the above variables. In other words, women with high levels of SPA, appearance-based RE, FNE, and GRS tended to rate free weights as a male appropriate activity. It is possible that women in this sample avoided using free weights due to the combined effect of low body image and increased anxiety about adhering to traditional female roles.

The frequency of free weight use was also positively correlated with the frequency of using high male spaces in the gym and with the perceived gender appropriateness of using free weights. This may be partially explained by the fact that the spaces in the recreation center with larger amounts of free weights also had higher average percentages of men. However, the seven observed spaces were deliberately chosen due to the variety of equipment within them. Therefore, these correlations suggest that women who lift weights more frequently may be more comfortable in male dominated spaces. One possible explanation for this would be perceived competence. Lemoyne, Pierre, and Frédéric (2015) showed that college students who feel highly competent in a particular form of physical activity were more likely to engage in that particular activity. Furthermore, a perceived lack of competence is associated with lower levels of strength training (Zach & Adiv, 2016). In addition, women who rated free weights as more feminine used them more often. This is consistent with research on

gender typing in sports. Plaza et al. (2016) showed that women who engaged in typically masculine sports tended to rate certain masculine activities as less masculine than those who did not. Overall, these correlations indicate that women who strength train frequently may feel more competent lifting weights and may be more comfortable in male-dominated spaces than women who do not.

One of the most striking findings in this study relates to the observed gender composition of the seven recreation center spaces. While most of the spaces contained aerobic and strength training equipment, the spaces with the most amount of strength training equipment were those with an average gender composition of 80% or more men (See Table 2). While data was not collected about the gender breakdown of all recreation center users, anecdotal observation suggests that female users typically exercise on the various cardiovascular machines in the open areas of the recreation center that could not easily be accounted for in this study. This indicates that, within this particular population, very few women use strength specific gym spaces.

The gender discrepancy observed in the current study far exceeds the discrepancy identified by the CDC, which reported that 34.8% of men and 24.7% meet the national strength training recommendations (2013). It is important to consider how a university setting might exacerbate gender discrepancies in weight room use. The overrepresentation of men in these spaces may be partially explained by the unique layout of the recreation center itself. Each of the seven spaces observed in this study has discreet boundaries, making it easy to count the number of people within them. This also made each exerciser highly visible to the other people in the space. On the other hand, the spaces not accounted for in this study were more spread out and had lower visibility.

Considering women's moderately high levels of social physique anxiety and fear of negative evaluation, the highly visible strength training spaces may have felt particularly hostile to female recreation center users.

Aim 1: Free Weight Use

Consistent with the hypothesis, the perception of free weights as appropriate for women was significantly related to higher free weight use among women in this sample. Conversely, women who perceived free weights as appropriate for men used them less frequently. This result supports previous research on women in the weight room. Salvatore and Marecek (2010) reported that women characterized the bench press as a masculine activity and were less likely to use that piece of equipment. Results from the current study suggest that some women still consider lifting weights to be a masculine activity, and this may prevent them from engaging in strength training. Inconsistent with the hypothesis, higher appearance-based RE was associated with higher free weight use. One possible explanation for this is the increased popularity of some forms of weight lifting among women, possibly due to the increased participation in CrossFit (Steinfeldt et al., 2011). CrossFit (CF), founded in 2000 by Greg Glassman, has become a wide spread fitness movement focused on functional strength and conditioning. Because of the focus on heavy strength movements, high-level CF athletes of both genders are often very muscular. In the past several years, CF has become highly visible in the media. Extremely fit CF athletes are featured in advertisements for products ranging from Reebok active wear to Michelob Ultra beer. The proliferation of this lean, fit female figure in the media may drive women to lift weights in order to achieve such a body. While ideal physique was not significantly related to free weight use, the low body image

and thin ideal physiques of the women in this sample suggest that the desire to be thin may still drive exercise behaviors.

Aim 2: Cardio Machine Use

Consistent with the hypothesis, women with higher levels of appearance-based RE and thinner ideal physiques exhibited higher cardio machine use. While fitness media now portrays more muscular women than in previous years (Steinfeldt et al., 2011), these women are almost always quite lean. The desire for leanness, or thinness, continues to be a driving force for women (Dworkin & Wachs, 2009; Prichard & Tiggeman, 2012; Pila et al., 2016; Tiggeman & Zaccardo, 2015). Research has shown that women associate cardiovascular exercise with a thin body (Dworkin & Wachs, 2009; Readdy, Watkins, & Cardinal, 2011; Salvatorre & Marecek, 2010). Within the current sample, women who desire a thin body may be more likely to use cardio machines than free weights because of the association between aerobic exercise and thinness that has been propagated by the fitness media. This would also support the relationship between appearance-based motives for exercise and the use of cardio equipment. Women who choose to exercise in order to achieve a specific, likely thin, appearance may be more inclined to use cardio machines.

Inconsistent with the hypotheses, there was no significant relationship between cardio machine use and the perceived gender appropriateness of free weights. This may suggest that women's use of cardio machines is not driven by their perception of free weights as masculine. Because the gender appropriateness of gym equipment is a novel measure, there is no research on this particular relationship. Within the current study, this

finding suggests that women's use of cardio machines may be more related to a desire to be thin than a desire to avoid activities that are perceived as masculine.

Aim 3: Low Male Space Use

In support of the hypothesis, women who had high levels of SPA were more likely to use gym spaces with fewer men present than women with low levels of SPA. This finding is consistent with past research on SPA. Kruisselbrink et al. (2004) found that women had higher levels of state SPA in exclusively male exercise settings than in exclusively female settings. While the current study measured trait SPA, research has shown that women with higher dispositional levels of SPA also have higher situational levels of SPA (Martin Ginis, Murru, Conlin, & Strong, 2011). Women with high levels of trait SPA may be more inclined to exercise in spaces that cause the least amount of anxiety. In the case of the current study, those spaces may be ones in which the fewest men were present.

Inconsistent with the hypothesis, neither GRS nor FNE were significantly associated with using low male spaces. One possible explanation may be due to the fact that the seven spaces in this study's recreation center had higher percentages of men than women present. It is therefore possible that women with higher levels of GRS and FNE felt stress and perceived evaluative threat no matter which of the seven spaces they used. Salvatore and Marecek (2010) showed that women were more likely than men to experience situations in the gym that made them feel evaluated on both body weight or shape and competence or skill. Women have also been shown to frequently compare their appearance to other women, both within and without exercise settings (Pila et al., 2016; Myers & Crowther, 2009). It is possible that women with high levels of GRS and FNE

would feel uncomfortable in any gym setting, regardless of the gender composition of the exercisers.

Aim 4: High Male Space Use

Women with lower levels of GRS had higher use of high male spaces, which partially supports Aim 4. Previous research has shown that women with high GRS are particularly high on the fear of physical unattractiveness subscale. In addition, high GRS is associated with high levels of shame and guilt (Efthim, Kenny, & Mahalik, 2001). Subsequently, women with low levels of GRS experience less stress in situations where they may perceive themselves as being unattractive to others than women with high levels of GRS. As previously mentioned, male dominated exercise environments are associated with increased levels of evaluation concern and SPA in women (Focht & Hausenblas, 2004; Kruisselbrink, 2004). While no known studies have examined the link between GRS and exercise environment, it is possible that high levels of GRS may prevent women from exercising when high percentages of men are present. And, conversely, women who are low on GRS may perceive fewer barriers to exercising in male dominated spaces.

Contrary to the hypothesis, neither SPA nor FNE were significantly related to use of male dominated exercise spaces. As previously mentioned, women's evaluation concerns increase from all-female, to mixed, to all-male exercise settings (Kruisselbrink et al., 2004). Because the seven observed spaces in this study were predominantly masculine, it is possible that the women in this sample experienced FNE regardless of the type of space they were in. It is interesting to note that SPA predicted the use of low male spaces, while it did not predict the use of high male spaces. This particular finding may

be due to the method in which the gender percentage of each space was measured. This will be addressed in the limitations section.

Feminist Theory

The results of this study are consistent with feminist theory on fitness, gender, and bodies. In other words, women's exercise behavior is associated with both psychological motivations as well as broader social constructs related to gender roles and ideal bodies. Feminist research has shown that female athletes often feel the need to emphasize their feminine characteristics for fear of being perceived as too masculine (Krane et al., 2004; Bolin & Granskog, 2003). Many female athletes expressed concern that the time they spent in the weight room would cause them to develop too much muscle (Choi, 2003; Gruber, 2007; Grogan et al., 2004). This concern with appearing feminine was echoed in the current study. The thin ideal physique of the women in this sample indicates a fixation on the ideal female shape. In addition, the relationship between using free weights and perceiving free weights as gender appropriate suggests that women who consider weight lifting to be a masculine activity are more likely to avoid it.

The use patterns within the gym spaces illustrate that the recreation center, like all fitness centers and gyms, is a gendered space. The high percentage of men in each of the observed spaces indicates that parts of the recreation center that include weight training equipment are highly masculine. This supports previous research that identifies aerobic equipment and spaces as highly feminine while weight room spaces are highly masculine (Johansson, 1996; Dworkin, 2003; Craig and Liberti, 2007; Salvatore and Maracek, 2010). In addition, women in the current study who had higher levels of GRS were less likely to use high male spaces. This suggests that the fear of being perceived as

unfeminine may prevent the women in this sample from using spaces that have higher percentages of men.

Strengths of Study Design

The current study adds to the literature by (1) quantitatively examining the relationship between gender, culture, body image, and exercise among women in the gym; (2) linking the psychological antecedents of exercise behavior with broader social constructs related to gender and bodies; and (3) addressing the role of exercise type in the relationship between exercise and body image. There has been only one known quantitative study to explore women's use of the weight room and it was limited by small convenience samples and several non-validated measures (Salvatore & Marecek, 2010). Therefore, the current study provides a novel and important perspective on women and exercise.

This is the first known study to link ideal physique to exercise type, suggesting that the desire to attain the ideal, thin female figure may be related to women's use of cardio machines. Not only does exercise type play a role in exercise behavior, but exercise space, particularly in gyms, may also be related to women's fitness experience. As a result, the current study examined exercise behavior in terms of the gender composition of spaces within the recreation center. This original approach can provide important information on the link between gender norms and exercise behavior.

Study Limitations

A higher percentage of Caucasians participated in this study (80.8%) than is represented in the university population (64.4%). It is unclear whether this overrepresentation is due to a lack of interest in the survey among minority recreation

center users or if there is higher use of the recreation center among Caucasians. An additional limitation of this study is related to the two measures used to determine gym use. The equipment use measure has not been validated, but rather was heavily adapted from a measure used by Salvatore and Marecek (2010). The space use measure was entirely new. However, this was necessary in order to tailor the questionnaire to the specific space of the university recreation center. A third limitation is related to Aims 3 and 4, which examined SPA, FNE, and GRS as possible predictors of using low or high male gym spaces. Due to the particular layout of the recreation center, not all spaces were accounted for in the space use questionnaire, which may have affected the results. A final limitation pertains to the gender composition of the gym spaces. On average, each of the seven spaces contained a higher percentage of men than women. For ease of data interpretation, spaces with the highest average percentage of men were classified as high male (93%; 86%; 84%; 80%) and spaces with lower percentages of men were classified as low male (60%; 58%; 55%). The over representation of men in each of the gym spaces used in this study may have affected the results.

Future Research Directions

Future research should explore the racial breakdown of campus fitness centers users to determine how race and ethnicity may relate to exercise behavior. Researchers should also investigate more efficient ways of measuring exercise type and space use to better understand female exercise behavior within a gym environment. In addition, research would benefit from studies that examine commercial fitness centers with more traditional layouts. While participants who were currently working with a personal trainer were excluded from the present study, future research should examine the associations

between personal training and women's use of certain equipment and spaces within a gym environment. Considering that feminist research on women in the weight room must examine both sociological and psychological factors, future researchers might consider a mixed methods approach in which quantitative data is reinforced by rich qualitative content. There is also a need for experimental research that tests the longitudinal effect of strength training on body image variables and sociological constructs such as ideal physique. In addition, these experimental studies should examine the differences in state body image and sociocultural variables among women who lift weights in mixed- and single-gender environments. Finally, future research should investigate the possibility of domain transfer. Specifically, if women are more comfortable engaging in traditionally male activities such as strength training in male dominated spaces, are they also more likely to feel comfortable in other male dominated spaces such as certain board rooms, STEM fields, or courtrooms? This research would have important implications for gender equality.

Practical Implications

The current findings have important potential implications within higher education. Considering how few women use strength training spaces in the recreation center, universities should consider methods to increase the female presence in these spaces. The current research indicates that women may be deterred from using spaces that are male dominated. In order to address this concern, universities should consider designating specific weight training spaces on campus as female-only during certain times of the day. In addition, recreation centers might consider offering female only strength training classes. In the current study body image was associated with the low use

of male dominated spaces. As such, university strength training classes might also contain a teaching element that focuses on increasing body image and critical awareness of thin, idealized women in fitness media. Finally, colleges and universities with fitness centers should engage in campus wide campaigns that encourage women to use the campus gym.

Conclusions

Despite recommendations that both men and women should engage in strength training on two or more days per week, only 24.7% of women meet these guidelines, compared to 34.8% of men (CDC, 2013). Strength training has a number of physiological and psychological benefits for both genders. These benefits include increased body image and decreased risk for osteoporosis, both of which are particularly important for women (Winett & Carpinelli, 2001; Mosti et al., 2014; Henry, Anshel, & Michael, 2006; Williams & Cash, 2001; Martin Ginis et al., 2014; Lubans, Aguiar, Callister, 2010; Tucker & Maxwell, 1992). Despite the low adherence to the strength training guidelines, very little research has focused on women's psychological and sociological experiences with strength training and the weight room. The present study used an observational design to explore women's use of a collegiate fitness facility from a psychosocial perspective. By taking into account psychological factors such as body image and motivation as well as sociocultural concepts like gender and media-driven body ideals, the current research addresses the exercise behavior of women from a broad perspective.

Findings from this study indicate that women's perceptions of the gender appropriateness of strength training equipment is related to their use of that equipment. Specifically, women who rate free weights as a masculine activity have higher free

weights use. In addition, women in this study exhibited quite thin ideal physiques. This could be the result of media images that depict thin, toned female bodies. Thin ideal physique was related to the use of cardio equipment, such that women who desired thinner bodies used cardio machines more frequently than those who desired less thin physiques. These findings suggest that women engage with particular types of exercise based on their relationships to the cultural constructs of gender and ideal body type. Finally, participants' levels of GRS and SPA predicted the gender composition of the spaces they used. Higher SPA was associated with gym spaces in which more women were present, while lower levels of GRS was associated with gym spaces in which more men were present. This suggests that women's self-perceptions and relationships to their perceived gender roles may dictate how they use mixed-gender gym environments. Overall, these findings indicate that sociocultural gender norms play an important role in the exercise behavior of women. In order to bolster women's low adherence to the strength training guidelines, researchers and practitioners must address the gendered aspects of gyms and strength training as well as their potential effects on women's body image.

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Appendix A: IRB Approval Form

UNIVERSITY OF MINNESOTA

Twin Cities Campus

Human Research Protection Program
Office of the Vice President for Research

D528 Mayo Memorial Building
420 Delaware Street S.E.
MMC 820
Minneapolis, MN 55455

Phone: 612-626-5654
Fax: 612-626-6061
Email: irb@umn.edu
http://www.research.umn.edu/subjects/

October 27, 2016

Holly E Crane

RE: "No Girls Allowed: Perceived Psychosocial Barriers to Women's Use of the Weight Room"

IRB Code Number: 1610P96581

Dear Ms. Crane:

The Institutional Review Board (IRB) received your response to its stipulations. Since this information satisfies the federal criteria for approval at 45CFR46.111 and the requirements set by the IRB, final approval for the project is noted in our files. Upon receipt of this letter, you may begin your research.

IRB approval of this study includes the consent form received October 26, 2016.

The IRB would like to stress that subjects who go through the consent process are considered enrolled participants and are counted toward the total number of subjects, even if they have no further participation in the study. Please keep this in mind when calculating the number of subjects you request. This study is currently approved for 400 subjects. If you desire an increase in the number of approved subjects, you will need to make a formal request to the IRB.

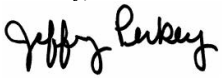
On October 20, 2016, the IRB approved the referenced study through October 19, 2017, inclusive.

The Assurance of Compliance number is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003). Research projects are subject to continuing review and renewal. You will receive a report form two months before the expiration date. If you would like us to send certification of approval to a funding agency, please tell us the name and address of your contact person at the agency.

As Principal Investigator of this project, you are required by federal regulations to inform the IRB of any proposed changes in your research that will affect human subjects. Changes should not be initiated until written IRB approval is received. Unanticipated problems or serious unexpected adverse events should be reported to the IRB as they occur. Notify the IRB when you intend to close this study by submitting the Study Inactivation Request Form.

The IRB wishes you success with this research. If you have questions, please call the IRB office at 612-626-5654.

Sincerely,



Jeffery Perkey, CIP, MLS
IRB Analyst

CC: Beth Lewis

Driven to Discover℠

Appendix B: Recruitment Email

Dear University Rec Center User,

Hi! My name is Holly Crane and for my Master's thesis, I am conducting a survey for women who use the Rec Center. I am interested in the equipment and spaces you use most frequently, as well as your perceptions of exercise and your body.

This survey will take about 5-10 minutes to complete. Participants will be included in a drawing for a $50 gift certificate to the French Meadows Bakery & Café at the entrance to the Rec Center. You will also be given the results of the study once completed.

Here is the link to the
study: https://umn.qualtrics.com/SE/?SID=SV_e9Gbc8rWD9ZKp8N

Thank you for your time and effort!

Sincerely,
Holly Crane

Master's Candidate
School of Kinesiology, CEHD
University of Minnesota - Twin Cities
crane133@umn.edu

Appendix C: Consent Form

No Girls Allowed: Percieved Psychosocial Barriers to Women's Use of the Weight Room

You are invited to be in a research study of women's physiological experiences exercising in the University Rec Center. You were selected as a possible participant because you have recently signed into the Rec Center using your U-Card or the biometric hand scan. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Holly Crane, Department of Kinesiology, University of Minnesota

Background Information

The purpose of this study is to explore potential reasons why so few women exercise in the weight rooms of fitness centers. This survey will assess the degree to which stress about gender roles, ideal body-type, and fear of being evaluated is related to the particular spaces and equipment that women use in the Rec Center.

Procedures:

If you agree to be in this study, we would ask you to do the following things:

Fill out the following brief survey that includes questions about stress, perceived gender roles, ideal body type, and use of the Rec Center including exercise space and type.

Risks and Benefits of being in the Study

The study has a few small risks: First, several of the survey questions are about ideal physique. Body image and type can be a sensitive subject, so these questions may cause a small degree of embarrassment or shame. Second, a number of questions deal with the concept of social and evaluation anxiety, which may cause some discomfort among participants who have a high degree of general anxiety. In general, the questions on the survey deal with body type and desire, gender roles and stress, and social evaluation concerns, all of which might be slightly uncomfortable topics for certain individuals.

There are no direct benefits to participation, other than exploring a bit more about your own tendencies in the gym.

Compensation:

Each person who completes the survey will be entered into a drawing to receive a $50 gift certificate to the French Meadows Café at the entrance of the Rec Center. The drawing will occur once all of the surveys have been completed. Given the number of surveys being sent out, participants will have about a 1 in 400 chance of winning the gift card.

Confidentiality:

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records. Study data will be encrypted according to current University policy for protection of confidentiality.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researcher conducting this study is Holly Crane. If you have any questions, **you are encouraged** to contact her at Cooke Hall 210 or at crane133@umn.edu. You may also contact her advisor, Beth Lewis, at blewis@umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked any questions I might have and have received answers. I consent to participate in the study.

Signature:_____Date: _____
Signature of Investigator:_____Date: _____

Appendix D: Demographic Questionnaire

1. What is your Date of Birth _____. (MM/DD/YYYY)
2. Which of the following do you consider to be your racial group?
   (1) White
   (2) American Indian/Alaskan Native
   (3) Asian
   (4) Native Hawaiian or Other Pacific Islander
   (5) Black or African American
   (6) Other (describe): _____.
   (7) Don't know/refuse
3. Which of the following do you consider to be your ethnic group?
   (1) Hispanic or Latino
   (2) Not Hispanic or Latino
4. Have you ever been trained by a personal trainer before?
   a. NO
   b. YES
5. If yes, for how long?
   c. Less than one month
   d. 1 – 6 months
   e. 6 months – 1 year
   f. Greater than 1 year
6. Are you currently being trained by a personal trainer?
   g. NO
   h. YES
7. How frequently do you work out alone?
   i. Never
   j. Very Rarely
   k. Rarely
   l. Occasionally
   m. Very Frequently
   n. Always
8. Would it be OK if we contacted you in the future to see if you would be interested in participating in another study we might be running?
   o. NO
   p. YES
9. If yes, please provide your email address here: _____

Appendix E: Equipment and Space Use Questionnaires

Frequency of Equipment Use

On the following chart, indicate on how many days during the last week you used the following types of equipment in the Rec Center.
Description of equipment types:

Cardio Machines: Treadmills, bikes, elliptical trainers, jacob's ladder, etc
Functional Training Equipment: TRX, cables, battle ropes, kettlebells, jump rope, etc
Resistance Machines: Machines where resistance is added by using a pin or plates and moves along a predetermined path
Free Weights: Dumbbells or barbells

	Cardio Machines	**Functional Training Equipment**	**Resistance Machines**	**Free Weights**
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				

Were the last seven days a typical week for you in terms of working out? YES NO

Frequency of Space Use

On the following chart, indicate on how many days during the last week you used the following spaces in the Rec Center.

	Downstairs Weight Room	Upper Fitness Center	Lower Fitness Center	1st Tier Resist. Mach.	2nd Tier Ellipt. and Tread.	3rd Tier Free Weights and TRX Training Zone	Top Tier Resist. Mach.	Other
Day 1								
Day 2								
Day 3								
Day 4								
Day 5								
Day 6								
Day 7								

Appendix F: Psychosocial Variables Questionnaires

Gender Appropriateness of Gym Equipment

(Adapted from: Metheny, 1965)

Please rate the following gym activities on a gender-appropriateness scale. Which activities do you believe are more *feminine or masculine*?

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

Feminine Neutral Masculine

1. Using Cardio Machines (Treadmills, bikes, elliptical trainers, jacob's ladder, etc) ___
2. Using Functional Training Equipment (TRX, cables, battle ropes, kettlebells, jump rope, etc) ___
3. Resistance Machines (Machines where resistance is added by using a pin or plates and moves along a predetermined path) ___
4. Free Weights (Dumbbells or barbells) ___

Brief Fear of Negative Evaluation Scale

(Leary, 1983)

Please circle the number that best corresponds to how much you agree with each item.

	Not at all characteristic of me	A little characteristic of me	Somewhat characteristic of me	Very characteristic of me	Entirely characteristic of me
1. I worry about what other people will think of me even when I know it doesn't make any difference.	1	2	3	4	5
2. I am frequently afraid of other people noticing my shortcomings.	1	2	3	4	5
3. I am afraid that others will not approve of me.	1	2	3	4	5
4. I am afraid that other people will find fault with me.	1	2	3	4	5
5. When I am talking to someone, I worry about what they may be thinking about me.	1	2	3	4	5
6. I am usually worried about what kind of impression I make.	1	2	3	4	5
7. Sometimes I think I am too concerned with what other people think of me.	1	2	3	4	5
8. I often worry that I will say or do wrong things.	1	2	3	4	5

Reasons for Exercise Inventory: Health and Appearance Subscales

(Silberstein et al., 1988)

People exercise for a variety of reasons. When people are asked why they exercise, their answers are sometimes based on the reasons they believe they *should* have for exercising. What we want to know are the reasons people *actually* have for exercising. Please respond to the items below as honestly as possible**. To what extent is each of the following an important reason that you have for exercising?** Indicate your response to each item by circling the appropriate number, ranging from 1 (*not at all important)* to 7 *(extremely important)*.

	Not At All Important					Moderately Important	Extremely Important
1. To be slim	1	2	3	4	5	6	7
2. To improve my muscle tone	1	2	3	4	5	6	7
3. To maintain my physical well-being	1	2	3	4	5	6	7
4. To improve my appearance	1	2	3	4	5	6	7
5. To improve my strength	1	2	3	4	5	6	7
6. To redistribute my weight	1	2	3	4	5	6	7
7. To improve my endurance, stamina	1	2	3	4	5	6	7
8. To be attractive to others	1	2	3	4	5	6	7
9. To improve my flexibility, coordination	1	2	3	4	5	6	7

Social Physique Anxiety Scale

(Martin et al., 1997)

The following questionnaire contains statements concerning your body physique or figure. By physique or figure we mean your body's form and structure; specifically, body fat, muscular tone, and general body proportions.

Instructions: Read each item carefully and indicate how characteristic it is of you according to the following scale.

1 = Not at all characteristic of me
2 = Slightly characteristic of me
3 = Moderately characteristic of me
4 = Very characteristic of me
5 = Extremely characteristic of me

_____ 1. I wish I wasn't so uptight about my physique or figure.
_____ 2. There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively.
_____ 3. Unattractive features of my physique or figure make me nervous in certain social settings.
_____ 4. In the presence of others, I feel apprehensive about my physique or figure.
_____ 5. I am comfortable with how fit my body appears to others.
_____ 6. It would make me uncomfortable to know others were evaluating my physique or figure.
_____ 7. When it comes to displaying my physique or figure to others, I am a shy person.
_____ 8. I usually feel relaxed when it's obvious that others are looking at my physique or figure.
_____ 9. When in a bathing suit, I often feel nervous about how well proportioned my body is.

Female Gender Role Stress Scale
(Gillespie & Eisler, 1992)

Directions: Please read the descriptions of the following situations. Then rate how stressful the situation would be for you if it has happened or did happen in the future. Give each item a rating on the scale from 1 to 6, ranging from not stressful to extremely stressful. Note: the term "mate" refers to either a spouse or partner in an intimate relationship.

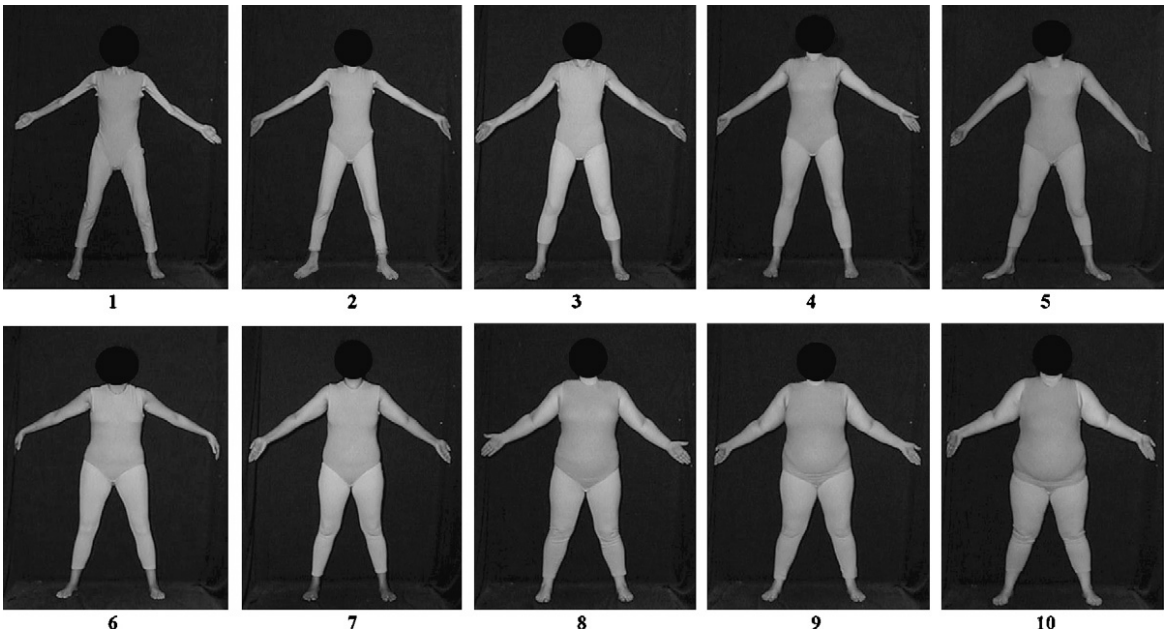
For example:
A. Driving a car 1
B. Discovering you have a serious illness 6
C. Losing your keys 2

1----------2----------3----------4----------5----------6
Not at all stressful Extremely stressful

1. Being perceived by others as overweight ____
2. Not being able to meet family members emotional need ____
3. Feeling less attractive than you once were ____
4. Trying to be a good parent and excel at work ____
5. Having others believe that you are emotionally cold ____
6. Being in a sexual relationship without any commitment ____
7. Being pressured for sex when seeking affection from your mate ____
8. Your child is dislike by his/her peers ____
9. Wearing a bathing suit in public ____
10. Having a weak incompetent spouse ____
11. Making sure you are not taken advantage of when buying a house or car ____
12. Having an intimate relationship without any romance ____
13. Being unable to change your appearance to please someone ____
14. Having to move to a new city or town alone ____
15. Bargaining with a salesperson when buying a car ____
16. Negotiating the price of car repairs ____
17. Being heavier than your mate ____
18. Being unusually tall ____
19. Supervising older and more experienced employees at work ____
20. Feeling that you are being followed by someone ____
21. Being considered promiscuous ____
22. Hearing a strange noise while you are home alone ____
23. Having to deal with unwanted sexual advances ____
24. Losing custody of children after divorce ____
25. Your mate is unemployed and cannot find a job ____
26. Feeling pressured to engage in sexual activity ____
27. Talking with someone who is angry with you ____
28. Turning middle-aged and being single ____
29. Having your car breakdown in the middle of the road ____
30. Having multiple sex partners ____
31. Having to "sell" yourself at a job interview ____
32. Hearing that a dangerous criminal has escaped nearby ____

33. Receiving an obscene phone call ____
34. Having someone else raise your children ____
35. Trying to get your spouse to take responsibility for childcare ____
36. Returning to work soon after your child is born ____
37. A very close friend stops speaking to you ____
38. Your mate will not discuss your relationship problems ____
39. Finding that you gained 10 pounds ___

Photographic Figure Rating Scale
(Swami et al., 2008)



Please answer the following questions:

1. Which figure do you find the *most* physically attractive? _____
2. Which is the largest figure that you consider physically attractive? _____
3. Which is the thinnest figure that you consider physically attractive? _____

Please use the following scale to answer the question below:

1----------2----------3----------4----------5----------6----------7----------8----------9
Not at all A little Somewhat Very Extremely

How physically attractive do you consider each woman above?

Fig 1_____ Fig 2_____ Fig 3 _____ Fig 4_____ Fig 5_____ Fig 6_____ Fig 7_____ Fig 8_____ Fig 9_____ Fig 10_____